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Thrombosis & COVID-19: Canadian Expert Perspectives

April 23, 2020

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Other: Shares of most pharma companies in personal investment portfolio

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- Novartis Pharmaceuticals Canada
- Pfizer Canada
- Servier Canada

Mitigating potential bias

The agenda and faculty for this program was developed by the scientific steering committee from Thrombosis Canada. All faculty have been directed that any recommendations involving clinical medicine are to be based on evidence that is accepted within the profession; and all scientific research referred to, reported, or used in the CME/CPD activity in support or justification of patient care recommendations conforms to the generally accepted standards.

Program learning objectives

After attending this program, participants will be able to:

- Incorporate the latest information about thrombosis and COVID-19 into clinical practice;
- Effectively manage anticoagulants and thrombosis remotely;
- Discuss the hematologic coagulopathic issues around COVID-19.

Agenda

Primary care perspective	Impacts of COVID-19 on primary care	Alan Bell, MD
Internist perspective	Current state of COVID-19	Jim Douketis, MD
Hematologist perspectives	Hematologic and coagulopathic issues in COVID-19	Eric Tseng, MD
	Managing your thrombosis patient remotely	Deepa Suryanarayan, MD
	Managing anticoagulants, especially VKAs, remotely	Sudeep Shivakumar, MD
Emergency medicine perspective	Impact of COVID-19 in the ER	Eddy Lang, MD
Question period		Alan Bell, MD, moderator

Introduction and primary care perspective

Alan Bell, MD, CFPC, FCFP

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The Challenge

- COVID-19 has re-defined provision of primary care
- Diagnosis and management of thrombotic diseases and other conditions requiring anticoagulant management presents specific challenges
  - Virtual visits often preclude detailed examination helpful for diagnosis of VTE
  - Emergency rooms are under increased burden and potential sources of exposure
  - INR monitoring potentially exposes patients to COVID-19 exposure
  - COVID-19 infection is associated with thrombotic and bleeding complications[1]

DIC, disseminated intravascular coagulation; INR, international normalization ration; VTE, venous thromboembolism

1. Thachil J et al. ISTH interim guidance on recognition and management of coagulopathy in COVID-19. ISTH Academy 03/25/20; 290506 https://doi.org/10.1111/jth.14810

Thrombosis Canada has been the voice of Thrombosis Medicine in Canada since 1991

Our vision

- We believe that providing point-of-care clinical guidance, founded on national and international guidelines, is the most effective and cost-efficient way to improve patient safety and outcomes, within a framework of patient-centred values and preferences.

- We continue with this mandate to assist health care professionals through this pandemic

Solutions


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Thrombosis Canada has developed practical and actionable guides related to the treatment and management of thrombosis.
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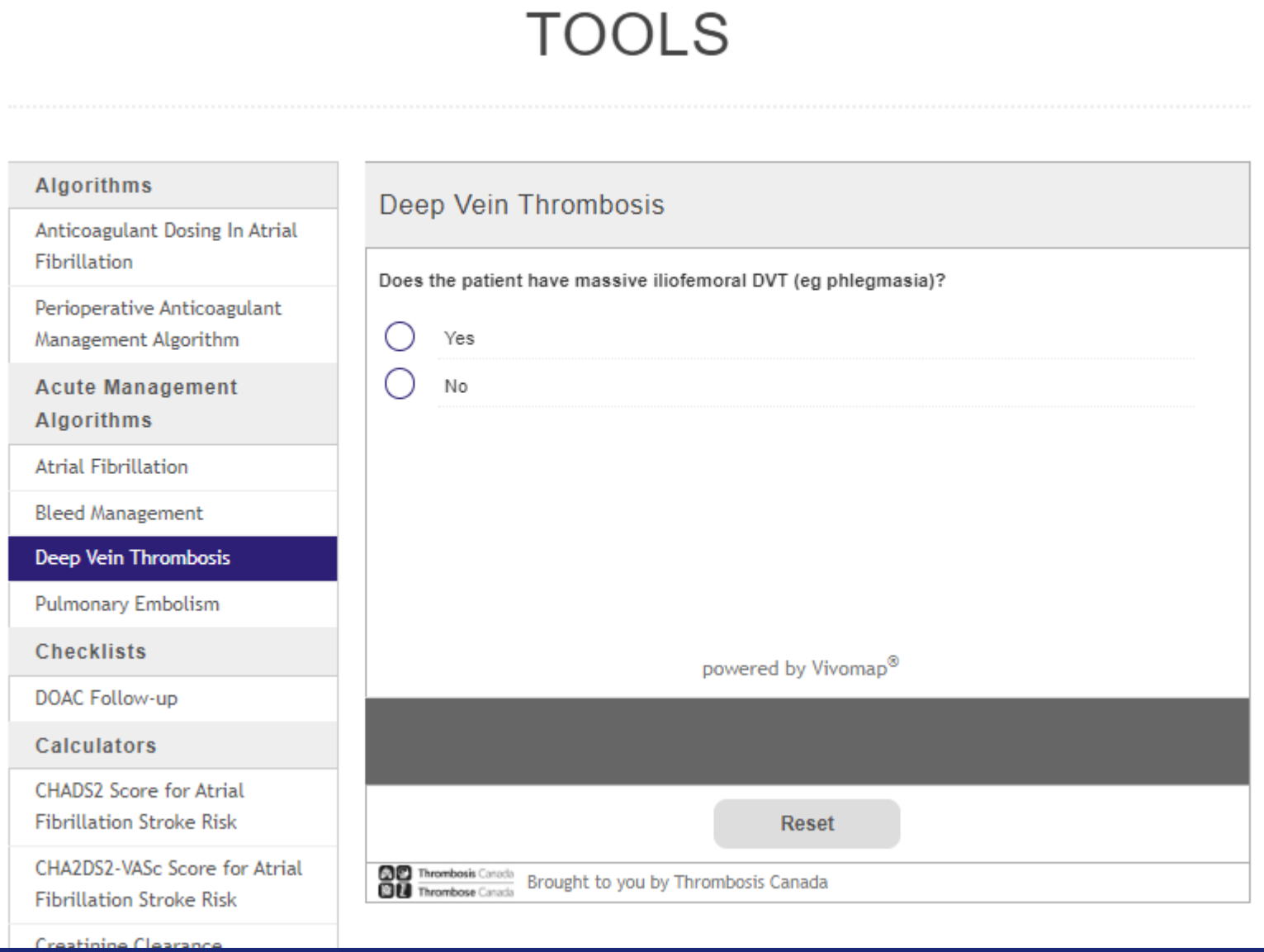
Solutions


TOOLS
Algorithms
Anticoagulant Dosing In Atrial Fibrillation
Perioperative Anticoagulant Management Algorithm
Acute Management Algorithms
Atrial Fibrillation
Bleed Management
Deep Vein Thrombosis
Pulmonary Embolism
Checklists
DOAC Follow-up
Calculators
CHADS2 Score for Atrial Fibrillation Stroke Risk
CHA2DS2-VASc Score for Atrial Fibrillation Stroke Risk
Deep Vein Thrombosis
Does the patient have massive iliofemoral DVT (eg phlegmasia)?
Yes
No
powered by Vivomap®
Reset
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Solutions: COVID-19

https://thrombosiscanada.ca/covid-19/

Where we're at with COVID-19: internist perspective

Jim Douketis, MD, FRCPC

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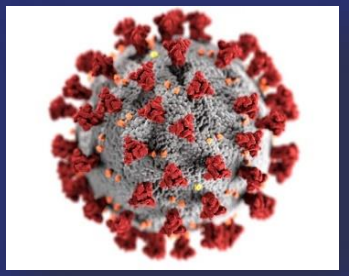
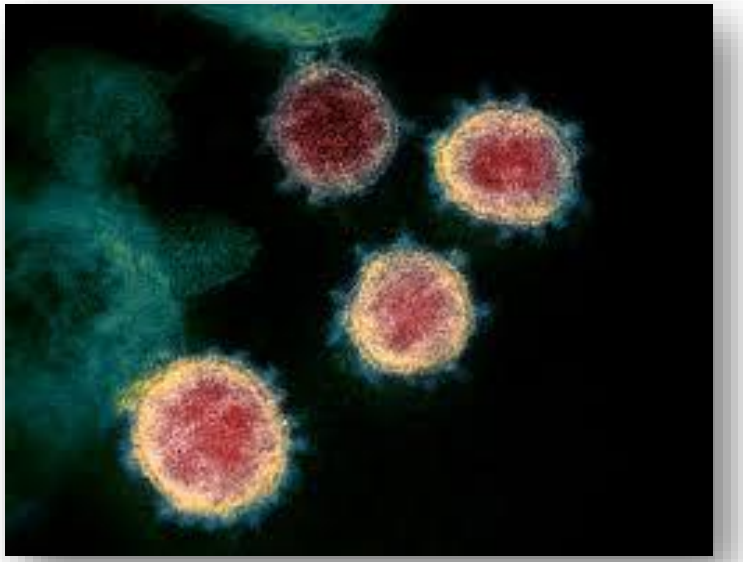
Where we're at with COVID-19



Etiology

- Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), RNA virus that belongs to the *betacoronavirus* (betaCoV) genus
- Genus also includes SARS-CoV (responsible for epidemic in 2002-3)



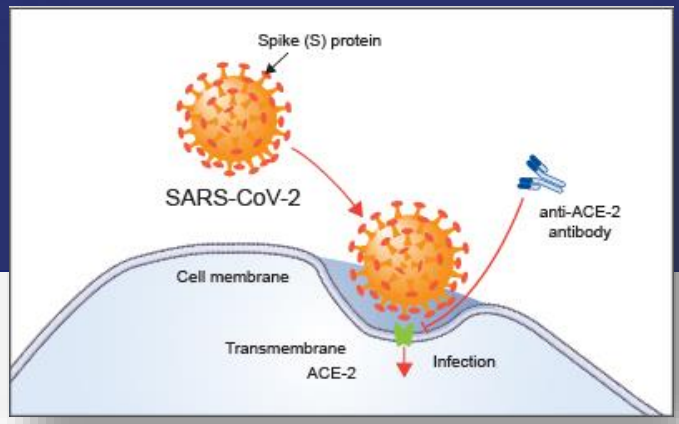
Epidemiology

- Epidemiologic data available at: www.who.int, www.cdc.gov, www.ecdc.europa.eu,
- April 23, 2020:
  - >2,650,000 cases and >184,000 deaths worldwide
  - >42,000 cases and >2,100 deaths in Canada

Risk Factors for COVID-related Adverse Outcomes

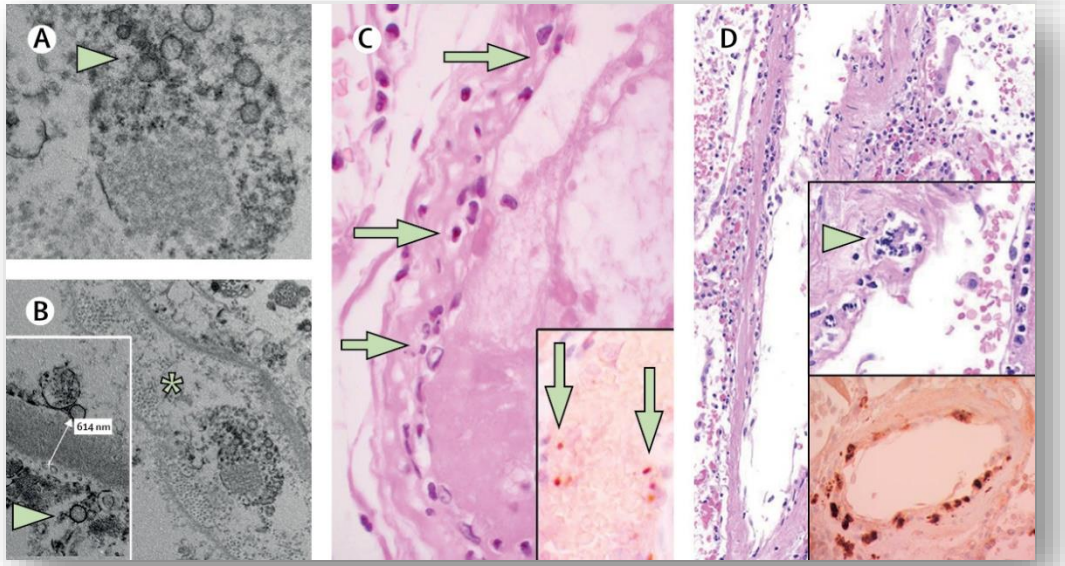
- Advanced age, male sex, obesity, smoking, diabetes, cardiovascular disease

Where we're at with COVID-19



Pathogenesis

- Virus uses lung ACE-2 as receptor, binding to spike glycoprotein on viral envelope
- In response to viral antigens, immune cells release pro-inflammatory cytokines and chemokines, results in uncontrolled systemic inflammatory response
- Endothelial invasion and endothelitis contributes to vascular injury and thrombosis.



Incubation and contagious period

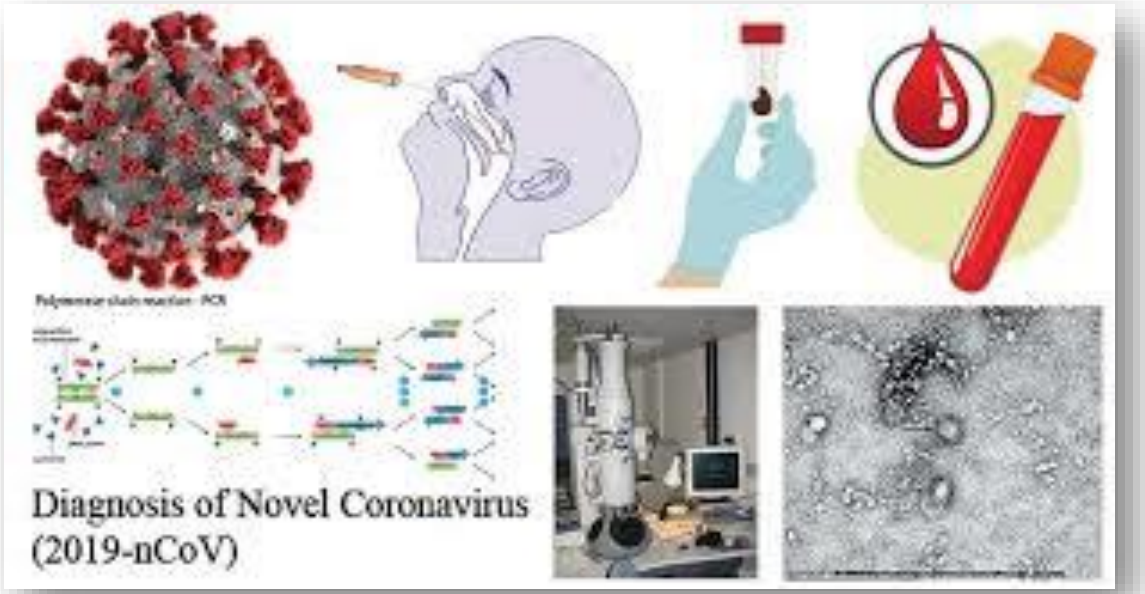
- Incubation period = **2-14 days** (mean = **5 days**)
- Viral shedding highest **~10 days** from time of infection (longer if severe infection)
- Mild infection recovery within **1 week** (up to 2 weeks)
- Severe infection recovery after **3-6 weeks**

Varga Z, et al. *Lancet* April 17, 2020

Where we're at with COVID-19

Diagnosis

- Detection of genetic material from virus using PCR from lower respiratory tract (intubated patients), uninduced sputum, NP swabs, NP aspirates



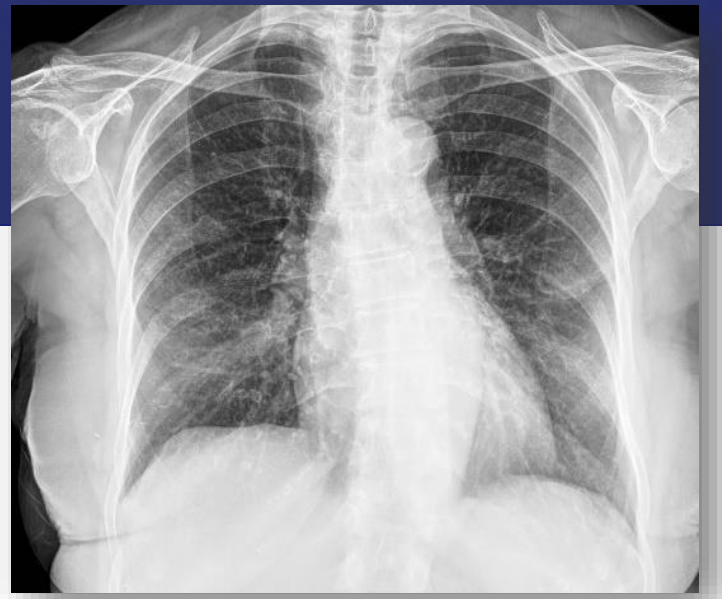
Where we’re at with COVID-19

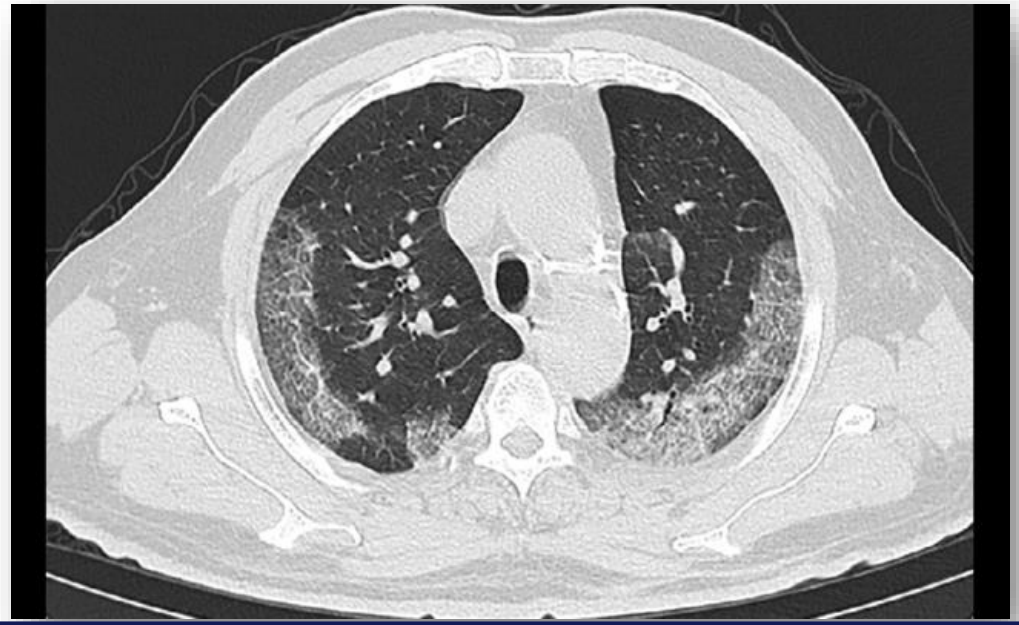
Clinical and radiological features

- Fever, dry cough, malaise, myalgia, headache, dyspnea (not dehydrated or septic)
- **Unexpected symptoms:** anosmia, dysgeusia, diarrhea, nausea
- **CXR:** bilateral pneumonia features; **CT:** bilateral, peripheral, inferior lobes, ground-glass opacification (week 2), pleural thickening and effusion, lymphadenopathy

Differential Diagnosis

- Influenza, other viral respiratory infections
- Atypical pneumonia
- Pneumocystosis





Where we're at with COVID-19

Treatment

- Supportive
- Oxygen therapy, with target of SpO_2 ≥90% (start with 5 L/min, titrate as needed)
- Glucocorticoids contraindicated (except if absolute indication)
- Antibiotics avoided (unless bacterial superinfection suspected, then use ceftriaxone or moxifloxacin)

Ongoing RCTs investigating:

https://covid19treatmentguidelines.nih.gov/introduction/

- Hydroxychloroquine or chloroquine ± azithromycin, colchicine (anti-inflammatory)
- Favipiravir, remdesivir (anti-viral)
- Tocilizumab, sarilumab, siltuximab (IL-6 pathway inhibitors)
- Convalescent plasma
- *Therapeutic-dose* heparin (UFH/LMWH) *vs. low-dose* heparin

Hematologic/coagulopathic issues in COVID-19: hematologist perspective

Eric Tseng, MD, MScCH, FRCPC

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COVID coagulopathy: main messages

1. Severe COVID infection is a **hypercoagulable state** with high VTE incidence in critically ill patients

2. Elevated D-dimers are frequently seen, but it remains unclear if this reflects **hypercoagulability/thrombosis** or merely the **proinflammatory response**

3. All admitted COVID+ patients should receive standard weight-adjusted VTE prophylaxis; there are **insufficient data at this juncture to recommend intensified empiric prophylaxis regimens** (for high D-dimer, ICU patients) outside of clinical trials

Common hematology lab abnormalities in COVID-19

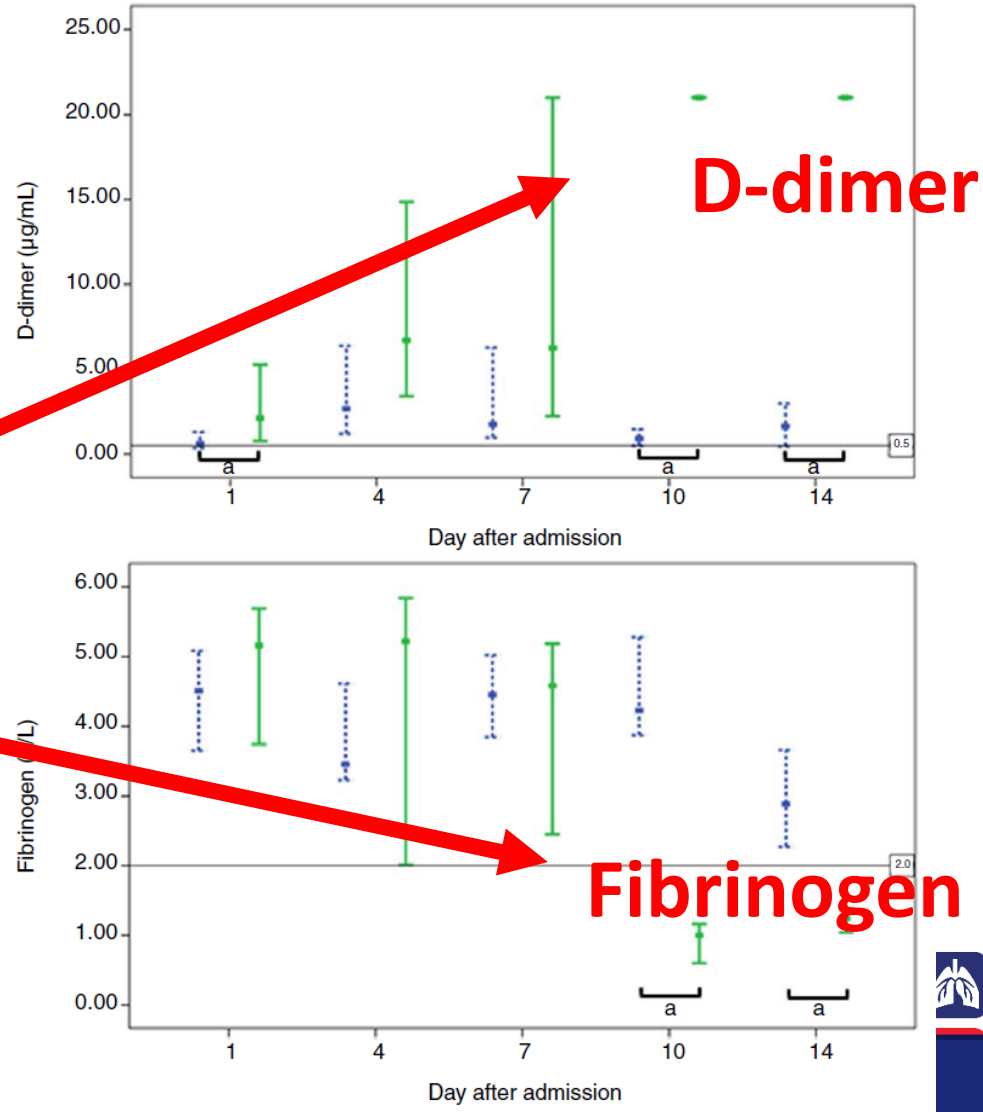
Parameter	Trend in COVID-19	Clinical Significance
Platelets	20-30% have platelets 100-150	Not clearly associated with mortality
Lymphocytes	Often moderate to severe lymphopenia 75-83% have ALC < 1.5	Severe lymphopenia (ALC < 0.5) and LDH elevation often seen in critical illness
PT (prothrombin time)	Mild prolongations (15-16 sec)	Prognostic (some association with mortality)
D-Dimer	Persistent, marked elevations (4-6x ULN) often seen in severe COVID	Prognostic (associated with mortality)
Fibrinogen	Typically elevated until late in disease course	Reductions can be seen late (10-14 days) into admission

Bhatraju PK, et al. *NEJM*. 2020;0(0):null. doi:10.1056/NEJMoa2004500; Guan W, et al. *NEJM*. 2020;0(0):null doi:10.1056/NEJMoa2002032
Tang Y-W, et al. *J Cli Microbiol*. April 2020. doi:10.1128/JCM.00512-20; Fan BE, et al. *Amer J Hematol*. n/a(n/a). doi:10.1002/ajh.25774

COVID19 has features of DIC: more procoagulant phenotype than consumptive coagulopathy

Coagulation parameters on admission (Wuhan)

Parameter	Normal	Survivors (n = 162)	Non-Survivors (n = 21)
PT (sec)	11.5-14.5	13.6	15.5
aPTT (sec)	29.0-42.0	41.2	44.8
D-dimer (mcg/ml)	<0.50	0.61	2.12
Fibrinogen (g/L)	2.0-4.0	4.51	5.16



Guan et al. (Wuhan): 1,099 COVID+ patients

- 46% high D-dimer on presentation (incl. 60% non-survivors)
- 70% requiring ICU/intubation had elevated D-dimer

Guan W, et al. *NEJM*. 2020;0(0):null. doi:10.1056/NEJMoa2002032; Tang Y-W, et al. *J Clin Microbiol*. April 2020. doi:10.1128/JCM.00512-20

Unclear whether high D-dimers reflect hypercoagulable state or merely the underlying inflammatory state

- Coagulation studies show **high D-dimers, fibrinogen, FVIII, VWF**
- However, D-dimer is a non-specific acute phase reactant
  - Also high in non-COVID pneumonia and other causes of SIRS/sepsis

Parameters	Normal range	COVID (n = 449)	Non-COVID (n = 104)	*P* values
Coagulation parameters				
PT (sec)	11.5–14.5	15.2 ± 5.0	16.2 ± 5.2	0.068
Platelet count (× 109/L)	125–350	215 ± 100	188 ± 98	0.015
D-dimer (μg/mL)	< 0.5	1.94 (0.90–9.44)	2.52 (1.40–5.81)	0.140

Yin S, et al. *J Thromb Thrombolysis*. April 2020. doi:10.1007/s11239-020-02105-8; Ranucci M, et al. J Thromb Haemost. 2020 Apr 17. doi: 10.1111/jth.14854.

Severe COVID is a hypercoagulable state marked by high D-dimers and fibrinogen

- Early pathologic studies demonstrate pulmonary microvascular thrombosis, but such findings may also be seen in non-COVID ARDS

Does this contribute to hypoxemic respiratory failure?
Could anticoagulation affect the overall disease course?

Fox et al. 4 autopsies in COVID+ patients with ARDS (2020) – New Orleans

- Diffuse alveolar damage
- Thrombosed small vessels with associated focal alveolar hemorrhage
- Suspicion of thrombotic microangiopathy in lungs (local megakaryocyte activation)

Dolhnikoff et al. 10 lung biopsies in COVID ARDS – Sao Paulo (2020)

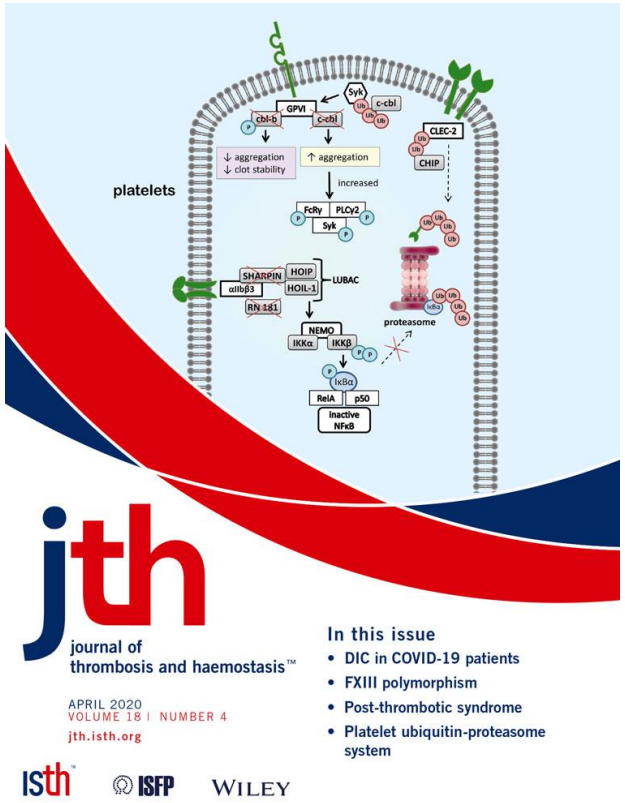
- Diffuse alveolar damage
- Variable number of fibrinous thrombi in small pulmonary arterioles and megakaryocytes

Fox SE, et al. BMJ Yale 2020. doi.org/10.1101/2020.04.06.20050575; Dolhnikoff M, et al. J Thromb Heamostas https://doi.org/10.1111/jth.14844; Frantzeskakai F, et al. Respiration 2017;93:212-225.

There is a high incidence of VTE in critically ill COVID+ patients who do not receive pharmacologic prophylaxis

Cui et al. 2020 (Wuhan): 81 ICU COVID patients

- Screened with CT chest, **leg US**, D-dimer
- None received pharmacologic prophylaxis
- 20/81 (25%) had lower extremity DVT
- D-dimer cutoff of 1.5 mcg/mL had sens 85%, spec 89%, NPV 95



Cui S, et al. *J ThrombHaemostasis*. n/a(n/a). doi:10.1111/jth.14830

VTE rates in ICU COVID patients are higher than other critically ill populations, despite mostly standard VTE prophylaxis

Helms et al. ICM 2020: 150 ICU patients (France)
• 80% standard prophylaxis (LMWH 4000 units daily or IV heparin 5-8 U/kg/hr) • 20% therapeutic dose
• >95% elevated D-Dimer and fibrinogen • No US screening for VTE
17% had PE **28/29 on CRRT had circuit thrombosis** 2/12 ECMO patients thrombosed pump COVID vs. non-COVID ARDS: PE 12% vs. 2%

Klok et al. Thromb Res 2020: 184 ICU patients (Netherlands)
• Routine proph. until Mar 30, then mostly intermediate dose (Nadroparin 2850 u BID or 5700 u BID if > 100 kg) • 9% therapeutic dose
• 38% coagulopathic, 13% RRT • No US screening for VTE
Cumulative incidence of thrombosis 31% 25 events (81%) were PE – *7 SSPE* 1 leg DVT, 2 catheter-related, *3 stroke* • Prolonged PT, aPTT associated with VTE

Helms J, et al. Intensive Care Medicine (2020); DOI: 10.1007/s00134-020-06062-x; Klok FA, et al. *Thrombosis Research*. April 2020. doi:10.1016/j.thromres.2020.04.013

VTE rates in COVID patients are higher in the ICU setting than the medical inpatient wards (have higher index of suspicion)

198 Dutch hospitalized patients (74 ICU)

ICU patients:

- Higher admission dimer (64% dimer > 1,000)
- 3% prior VTE, 4% active cancer
- 9.5% therapeutic a/c

Screening US in ICU implemented partway through

Standard weight based prophylaxis
After April 3, *intermediate dose* in ICU patients (Nadroparin 2,850 units BID, 5,700 units BID if > 100 kg)

Median 5 days follow-up
29% still hospitalized,
14% died

In ICU patients: cumulative incidence
All VTE: 25% (7 d), 48% (14 d)
Symptomatic VTE: 24%, 31%
Risk factors for VTE: high D-dimer, lymphopenia

Non-ICU patients: cumulative incidence
Any or symptomatic VTE: 6.5% (7 d), 10% (14 d)

Middeldorp S, et al. *Preprints* 2020, 2020040345. doi: 10.20944/preprints202004.0345.v1

Patients with elevated D-dimers derive benefit from heparin prophylaxis, but unclear whether they should receive higher doses of prophylaxis

Severe COVID+ inpatients (n = 449)

39% hypertension, 21% diabetes, 9% heart disease

All had supportive therapy
22% SIC score ≥ 4

Severe COVID: RR > 30, PaO2 93%, P/F < 300 mm Hg

22% (n = 99) VTE proph:

- Enoxaparin 40-60 mg/day (n = 94)
- SC UFH 10,000-15,000 units/day (n = 5)

Mortality at 28 days (retrospective)

No difference in 28-day mortality for heparin vs. non-heparin users (30.3% vs. 29.7%)

Heparin associated with reduced mortality if:

- **D-Dimer > 6x ULN** (32.8% vs. 52.4%, OR 0.44, p = 0.017)
- **SIC ≥ 4** (40.0% vs. 64.2%, OR 0.37, p = 0.029)

Tang N, Bet al. *J Thromb Haemostasis*. n/a(n/a). doi:10.1111/jth.14817

There is no established association between COVID with antiphospholipid antibodies or stroke


CORRESPONDENCE

Coagulopathy and Antiphospholipid Antibodies in Patients with Covid-19

- Case series of three inpatients with multiple ischemic strokes; all had CV risk factors
- None had high-risk APL serology or persistent positivity
  - ***Lupus anticoagulant negative***
  - ***(+) ACL IgA***
  - ***B2GP1 IgA and IgG***

} No titres

Zhang Y, et al. *NEJM*. 2020;0(0):null.doi:10.1056/NEJMc2007575

How to diagnose VTE if CT-PA is not possible?

ACC, ISTH (Bikdeli JACC 2020)

- Elevated D-dimers common in COVID19m do not currently warrant routine investigations for acute VTE in the absence of clinical manifestations or other supporting investigations

If CT-PA or V/Q scan cannot be performed *(isolation, instability, prone positioning)*

- Clinical suspicion (incl. disproportionate hypoxemia, unexplained RV dysfunction)
- Traditional VTE risk factors
- ***Alternative modalities:*** bedside echo (RV dysfxn, clot in transit), bilateral CUS, POCUS

Xie Y, et al. *Radiology: Cardiothoracic Imaging*. 2020;2(2):e200067. doi:10.1148/ryct.2020200067; Zuckier LS, et al. *J Nucl Med*. April 2020. doi:10.2967/jnumed.120.245571
ASH 2020 https://www.hematology.org/covid-19

Should one give therapeutic anticoagulation in absence of objective confirmation of VTE diagnosis?

Rapid changes in D-dimer are not diagnostic or specific for VTE

Alternative diagnoses (renal failure, infection) should be ruled out

American Society of Hematology
Consider empiric therapeutic anticoagulation (for suspected VTE) only if: 1. Unexpected clinical deterioration despite overall improvement in inflammatory markers and chest imaging (especially if high D-dimer, fibrinogen) 2. Physical exam findings of VTE (SVT, calf swelling, catheter- or line-related VTE), microvascular ischemia (skin findings)

ACC, ISTH (Bikdeli, JACC 2020)
• Optimal dosing is unknown • Majority of panel members would use prophylactic anticoagulation • Minority considered intermediate or therapeutic dose anticoagulation to be reasonable

ASH 2020; Bikdeli B, et al. *JACC* 2020;doi: https://doi.org/10.1016/j.jacc.2020.04.031.

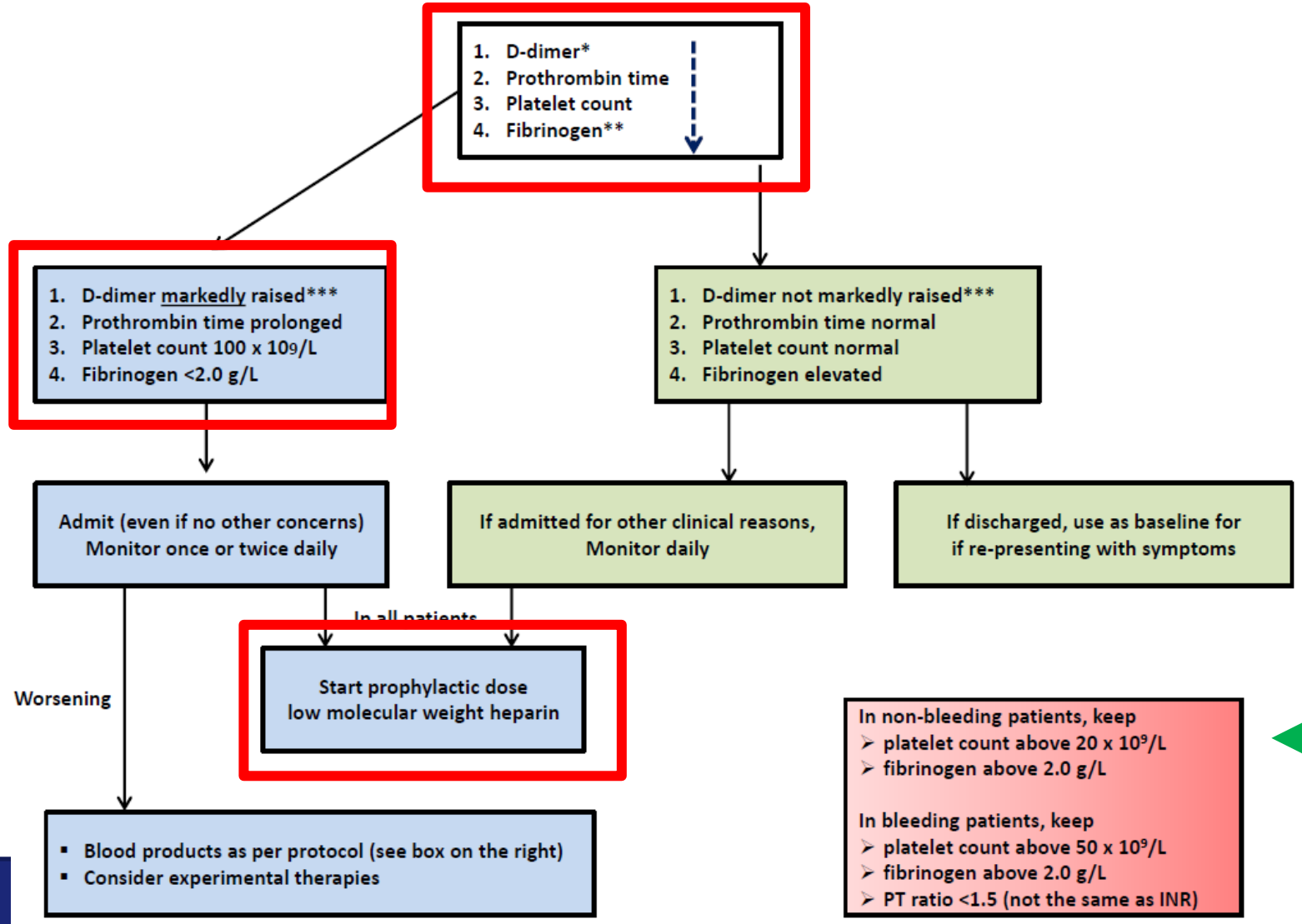
Anticoagulant prophylaxis for COVID: what to do?

- Some institutions have protocols using intermediate or therapeutic dose LMWH if elevated D-dimer – these are empiric and **currently** lack supporting clinical data

- Efficacy of **intermediate or therapeutic dosing based on D-dimer or ventilatory status** is unclear but generally not recommended outside of clinical trial setting

- **All patients admitted to hospital (ward or ICU) with COVID, regardless of D-dimer, should receive standard LMWH prophylaxis**
  - Consider dose adjustment in obese patients (>100-120 kg or BMI > 30)

Interim guidance from the ISTH



Not evidence based
Blood bank resources?

Thachil J, et al. *J Thromb Haemostasis*. n/a(n/a). doi:10.1111/jth.14810

Additional Guidance (Bikdeli, JACC 2020)

Inpatient Anticoagulant Management: Hospitalized Patients without DIC

- Prophylactic dose (or IPCs if anticoagulation contraindicated)
- Insufficient data to recommend intermediate or therapeutic doses
- Routine US screening for DVT in asymptomatic patients with D-dimer > 1500 not recommended

Inpatient Anticoagulant Management: Hospitalized Patients with DIC

- If no overt bleeding, provide prophylactic dose anticoagulation
- If no overt bleeding but on chronic anticoagulation, consider indication for anticoagulation and potential dose reduction depending on thrombotic risk

Bikdeli B, et al. *JACC* 2020;doi: https://doi.org/10.1016/j.jacc.2020.04.031.

Additional Guidance (Bikdeli, JACC 2020)

Post-discharge prophylaxis: Patients with Moderate to Severe COVID

- Should not be offered routinely
- Consider post-discharge pharmacologic prophylaxis for up to 45 days in those with VTE risk factors and low bleeding risk
- Encourage ambulation and physical activity

Prophylaxis in COVID Homebound Outpatients with VTE Risk Factors

- Consider mobility and thrombotic risk factors (prior VTE, active cancer), cardiopulmonary reserve, bleeding risk factors
- Consider pharmacological prophylaxis on case by case basis

Bikdeli B, et al. *JACC* 2020;doi: https://doi.org/10.1016/j.jacc.2020.04.031.

COVID coagulopathy: main messages

1. Severe COVID infection is a **hypercoagulable state** with high VTE incidence in critically ill patients

2. Elevated D-dimers are frequently seen, but it remains unclear if this reflects **hypercoagulability/thrombosis** or merely the **proinflammatory response**

3. All admitted COVID+ patients should receive standard weight-adjusted VTE prophylaxis; there are **insufficient data at this juncture to recommend intensified empiric prophylaxis regimens** (for high D-dimer, ICU patients) outside of clinical trials

Managing your thrombosis patient remotely in the COVID era: hematologist perspective

Deepa Suryanarayan, MD, MSc, FRCPC

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The unique challenges and considerations

- We have a responsibility to ensure anticoagulant care does not contribute to the burden on hospital health system
- Continue to keep patients on anticoagulants as safe as possible
- Change the way we deliver anticoagulation therapy by optimizing local solutions while protecting resources

Categories of patients

- Patients requiring initiation of oral anticoagulation
- Patients already on anticoagulation: DOACs
- Patients already on anticoagulation: VKAs

Patients requiring initiation of oral anticoagulation

- Ideally initiated by clinicians in primary care with experience in managing anticoagulation
- Seek guidance by telehealth or phone a specialist where needed
- Where possible, move to remote consultations to initiate anticoagulation therapy with arrangement of phone follow up
- Where possible, and if there are no contraindications, consider initiating DOACs instead of warfarin to minimize monitoring
- For patients who are not candidates for DOAC, consider LMWH (will need to educate patient regarding self injections)

Patients requiring initiation of oral anticoagulation

- If warfarin is the only choice and monitoring is not possible, consider LMWH for a brief period with modifications for monitoring
- Try to provide prescriptions for 90 days where possible with electronic prescription, or provide prescription directly to community pharmacies
- Local pharmacies will need to be aware of likely increase usage of DOACs and provincial pharma care plans urged to consider covering DOACs given the exceptional health care crisis.

Patients already on anticoagulation – DOACs

- Is anticoagulation still required?
- Utilize options for remote monitoring such as telehealth visits, video or telephone visits for follow ups
- During remote follow up: enquire about bleeding symptoms, check adherence and any potential drug interactions
- Avoid repeat labs if previously stable and if it is unlikely to have significant clinical impact

Patients already on anticoagulation – DOACs

- Encourage patients to avoid presenting to the emergency room for minor bleeding issues that can be addressed at home or with phone support. These include minor cuts, bruises, and nosebleeds.

- The Michigan Anticoagulation Quality Improvement Initiative (MAQI2) has online resources for patients on how manage many common minor bleeding issues at home: https://anticoagulationtoolkit.org/patients

- Seek specialist support should there be any concerns

Patient on chronic anticoagulation with mild form of COVID-19

- May present with diarrhea and decreased oral intake
- May affect INR
- DOACs: likely minimal effect unless diarrhea is significant

Patient on chronic anticoagulation with severe form of COVID-19- DOACs

- Concerns
  - Multiple therapeutic agents including antivirals (Lopinavir/ritonavir, darunavir), humanized monoclonal antibody against IL-6 (Tocilizumab), hydroxychloroquine, steroids, NSAIDs, antibiotics, bronchodilators and immunosuppressive agents: Potential for drug-drug interaction!
  - Metabolic alterations induced by acute disease
  - Potential multi-organ dysfunction
  - Concurrent functional coagulation derangements.
  - Possible necessity for mechanical ventilation or transfer to ICU
- Can lead to unpredictable and unstable DOAC anticoagulant effects

Testa S, et al. *Intern Emerg Med.* 2020;Apr 15:1–3.

Patient on chronic anticoagulation with severe form of COVID-19- DOACs

- Pragmatic approach in the absence of guided clinical trials
  - Need to balance thrombotic risk with bleeding risk
  - Specific DOAC plasma levels- not commonly available at all centers and in a timely manner to help guide treatment decisions
  - Consider switching to therapeutic LMWH or UFH with multiple investigational therapies or with any clinical deterioration.

Testa S, et al. *Intern Emerg Med.* 2020;Apr 15:1–3.

Managing anticoagulants, especially VKAs, remotely: hematologist perspective

Sudeep Shivakumar, MD, FRCPC

Thrombosis Canada

Managing anticoagulants, especially VKAs, remotely

- Warfarin management requires frequent bloodwork for INR monitoring
- Many patients worried about risk of getting bloodwork
  - Requires trip outside the house
  - Concerns about waiting for tests in areas with large amounts of people
- Has to be balanced against risk of being on warfarin without monitoring
  - Bleeding and thrombosis risks
  - However, risk of thrombosis when off anticoagulation for days in atrial fibrillation is low according to perioperative studies

Ways to mitigate frequent bloodwork

- Less frequent INR draws
  - For patients that are on stable doses of warfarin with therapeutic INR, can extend INR frequency to every 8-12 weeks (instead of monthly or more frequent)
  - May be appropriate for patients with lower thrombotic risk
    - DVT/PE over 1-3 months old
    - Atrial fibrillation with low CHADS score
    - Low risk mechanical aortic valves

Ways to mitigate frequent bloodwork

- Less frequent INR draws
  - Some labs across Canada are using time-tickets to minimize patient exposures
    - Patients wait in car until time for their test
    - Quebec has CLSCs (community health centres) to expedite process

Ways to mitigate frequent bloodwork

- Use of alternate ways of monitoring INR
  - Some pharmacies have point of care machines
    - Provinces may have programs where a pharmacist can check INR and adjust dose
  - Point of care machines can be purchased by patients
    - Machines may be a few hundred dollars, but test strips can be $$$
    - Not covered so may only be appropriate for select patients

Ways to mitigate frequent bloodwork

- Switching to direct oral anticoagulant (DOAC)
  - DOACs are approved for the management of DVT/PE and stroke prevention in atrial fibrillation
  - No routine lab monitoring needed
  - Rivaroxaban and apixaban do not require LMWH run-in for acute DVT/PE
  - Provincial pharmacare programs may make exceptions for coverage during this time
    - Nova Scotia is approving DOACs if COVID-19 is used as justification

Managing warfarin and DOACs remotely

- Risk of bleeding is <2% per year
- Can check in on patients by phone
  - Ask about bleeding complications, compliance, side effects
  - Be aware of drug-drug interactions, especially with new meds
- High INRs on warfarin can often be managed by holding warfarin alone if INR<10 and no bleeding
  - ACCP guidelines can be used as guide

Impact of COVID-19 in the ER: Update from the front lines

Eddy Lang, MDCM, CFPC (MU), CSPQ

Thrombosis Canada

Objectives

- Review the most recent data and causes of reduced acute care visits
- Unaccounted for excess mortality
- Updated modeling and tensions on hospital reopening
- ED priorities

Dramatic international phenomenon

ER visits to St. Paul's Hospital in Vancouver drop 40 per cent during pandemic

Dr. Daniel Kalla says hospital 'very safe,' urges people with serious medical conditions to attend

about an hour ago By: Mike Howell

Unexplained excess mortality

Where we found higher deaths than normal

AREA	PCT. ABOVE NORMAL	EXCESS DEATHS	–	REPORTED COVID-19 DEATHS	=	DIFFERENCE
Spain Mar. 9 - Apr. 5	66%	19,700	–	12,401	=	7,300
England & Wales Mar. 7 - Apr. 10	33%	16,700	–	10,335	=	6,300
France Mar. 9 - Apr. 5	28%	13,100	–	8,059	=	5,100
New York City Mar. 11 - Apr. 18	298%	17,200	–	13,240	=	4,000
Netherlands Mar. 9 - Apr. 5	33%	4,000	–	2,166	=	1,900
Istanbul Mar. 9 - Apr. 12	29%	2,100	–	1,006	=	1,100
Jakarta March	36%	1,000	–	84	=	900
Switzerland Mar. 9 - Apr. 5	21%	1,000	–	712	=	300
Belgium Mar. 9 - Apr. 5	25%	2,300	–	2,373	=	-30
Sweden Mar. 9 - Apr. 12	12%	1,100	–	1,160	=	-50

Note: Excess deaths are estimates that include deaths from Covid-19 and other causes. Reported Covid-19 deaths reflect official coronavirus deaths during the period when mortality data is available. In England and Wales, the Covid-19 deaths reflect the revised death figures from the Office of National Statistics. Istanbul reported deaths include those for all of Turkey, as city-level data has not been made public.

Collateral damage?

- Excess mortality in countries hit hard by COVID-19
- No population-level evidence of harms
- 40% reduction in STEMI activation
- Diagnostic yield in acute care seems to have increased
- COVID fear versus health benefits of physical distancing

Updated modelling and tensions created

- Early modeling based on numerous assumptions
- Updated approaches using real-world data have downscaled forecasts +++
- Is peak delayed or are we in steady state?
- Considerable unused capacity in acute care – forever lost

Emergency departments priorities

- PPE preservation / simulation / ED reorganization
- Intubation avoidance strategies / proning permissive hypoxia
- Palliative care as top priority
- Forward deployment to LTC / enhanced communications
- Outbreak surveillance
- Safety reports for COVID fear-related adverse outcomes

Closing thoughts ER perspective

Stay safe and be healthy!

FAQs

Alan Bell, moderator

Next webinar

Primary Care Perspective

Wednesday, April 29; 2:00 pm EST

Go to Thrombosis Canada website to register

https://thrombosiscanada.ca/thrombosiscovid19/

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