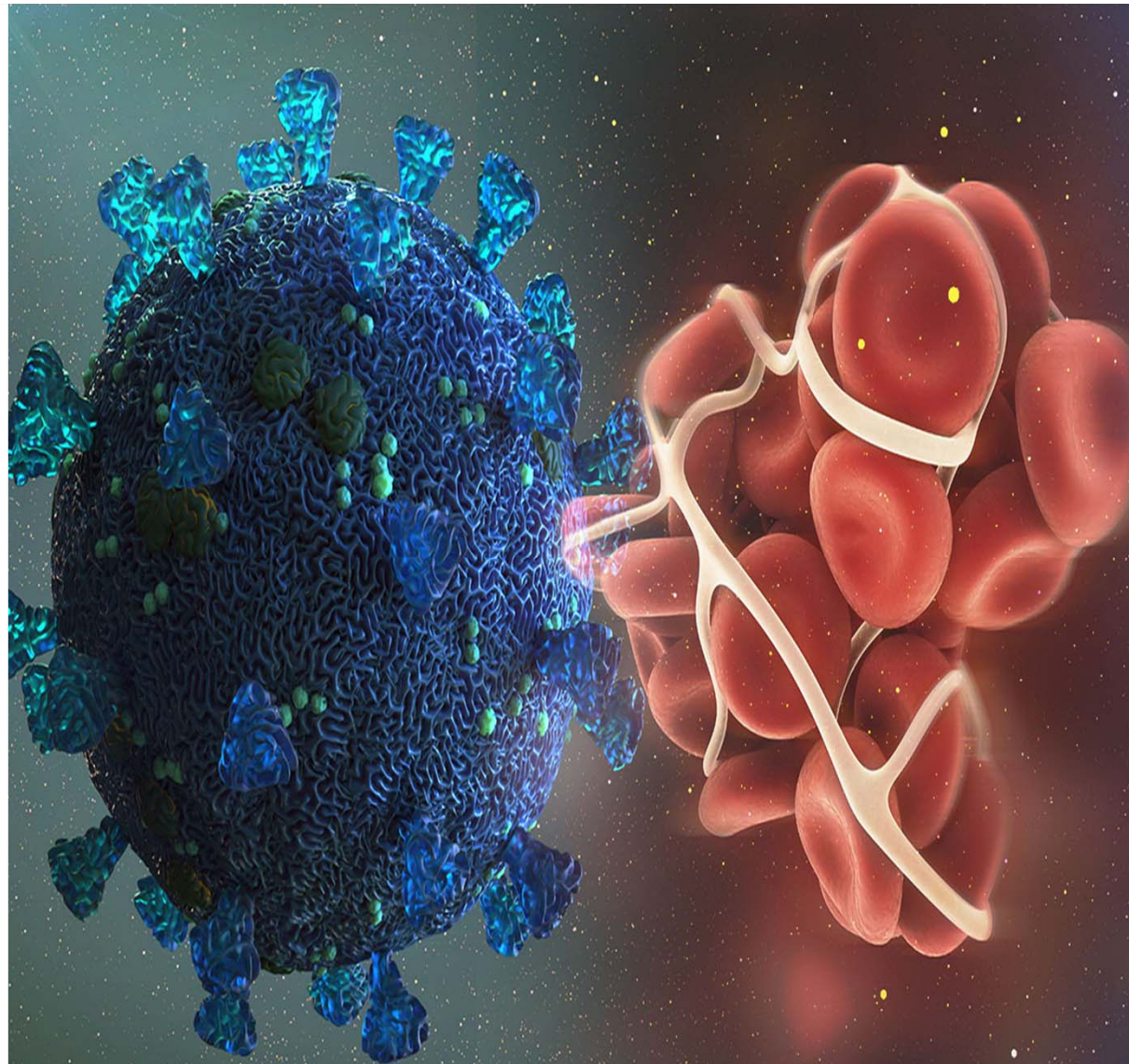


COVID Coagulopathy:

Case Presentations

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www.acc.org/latest-in-cardiology/articles/2020/04/17/14/42/thrombosis-and-coronavirus-disease-2019-covid-19-faqs-for-current-practitioners

Case #1



- 55yoF (Jehovah's Witness) PMH HTN and fibromyalgia
- Presented with 1 week of fevers, chills, cough
- SARS-CoV-2 (+)
- On arrival to the ED, oxygen saturation 80% on RA, placed on high flow nasal cannula (HFNC)

Case #1

ICU Course



- Intubated for progressive hypoxemia
- Severe ARDS (P/F 62 on 100% FiO₂, 16 PEEP)
 - Paralysis
 - Proning
 - Inhaled epoprostenol
 - Empiric treatment for PNA
- Bedside ultrasound concerning for LUE DVT
 - Started on therapeutic heparin drip
- Oliguric renal failure → CRRT

Case #1

ICU Course



Monitored Coagulopathy/Inflammation Labs

D-dimer

Fibrinogen

CRP

INR, PTT

Platelets

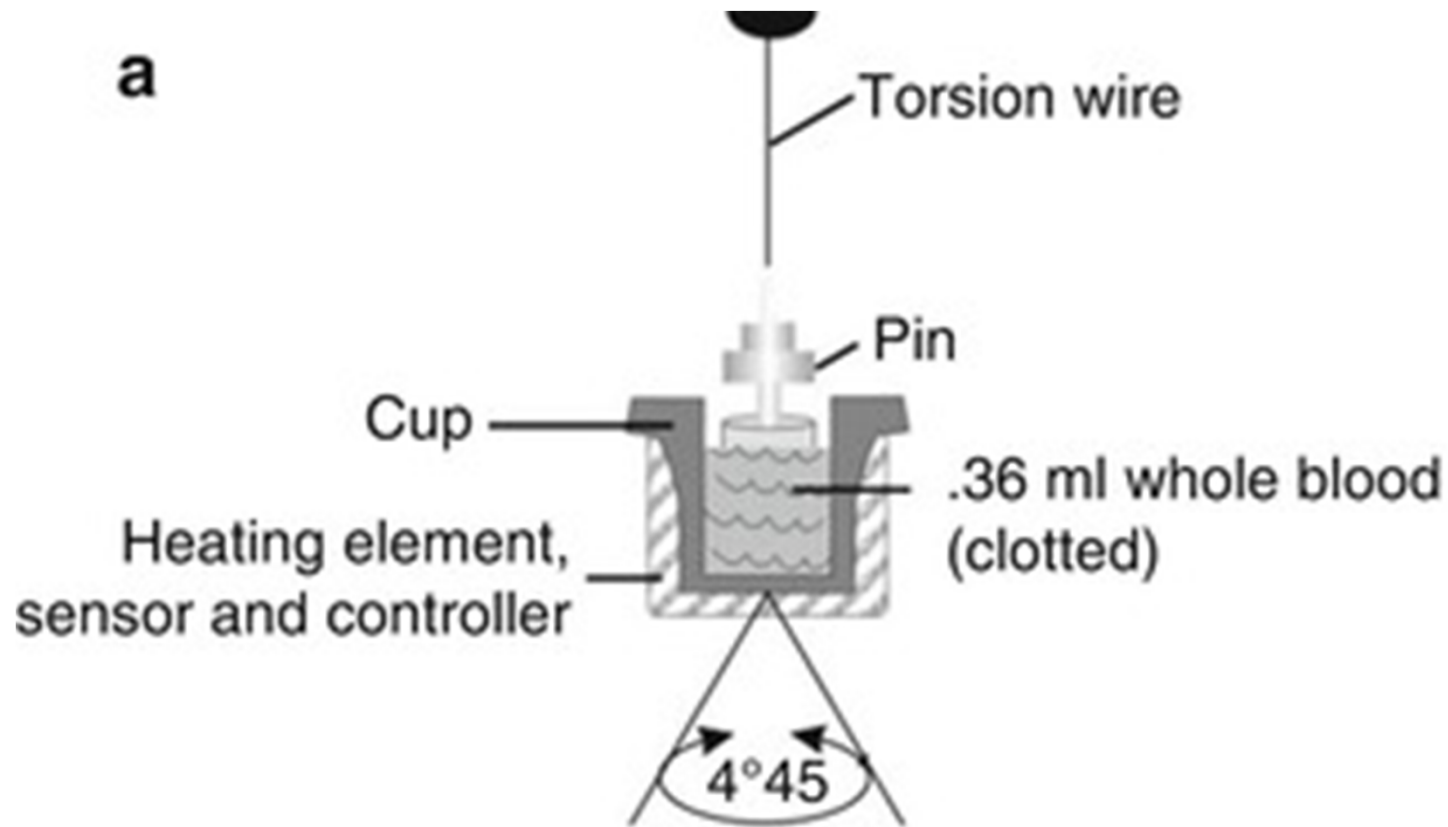
AT-III levels

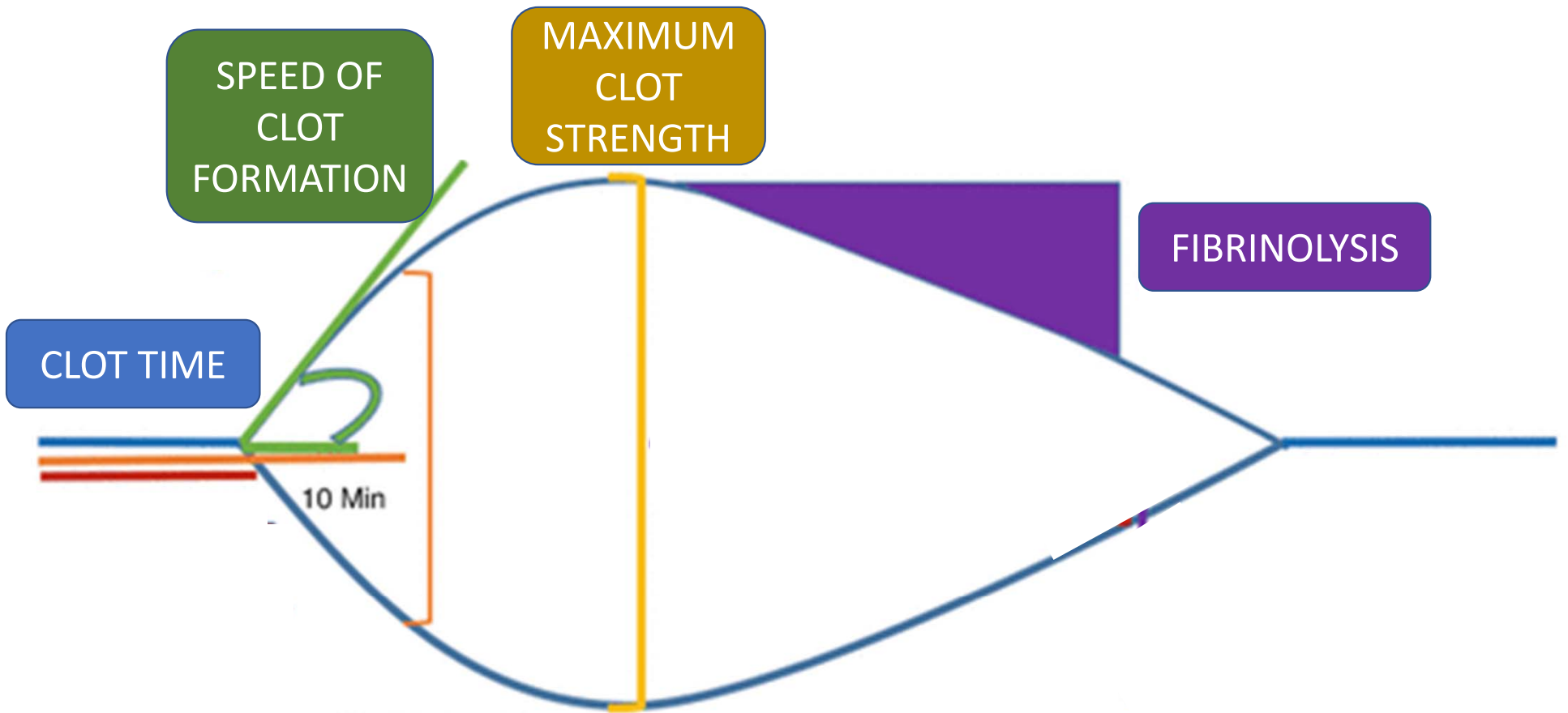
Anti-Xa levels

Measures of fibrinolysis

Plasma viscosity (normal 1.4-1.8 cP)

Thromboelastography (AKA TEG, ROTEM)





Intem INTRINSIC PATHWAY		13:10
<input type="checkbox"/>	INTEM CT	* (H) 275
<input type="checkbox"/>	INTEM CFT	* (L) 44
<input type="checkbox"/>	INTEM Alpha angle	* 81
<input type="checkbox"/>	INTEM A10	* (H) 73
<input type="checkbox"/>	INTEM A20	* (H) 77
<input type="checkbox"/>	INTEM MCF	* (H) 78
<input type="checkbox"/>	INTEM ML	
Extem EXTRINSIC PATHWAY		
<input type="checkbox"/>	EXTEM CT	* (H) 97
<input type="checkbox"/>	EXTEM CFT	* 55
<input type="checkbox"/>	EXTEM Alpha angle	* 80
<input type="checkbox"/>	EXTEM A10	* (H) 73
<input type="checkbox"/>	EXTEM A20	* (H) 77
<input type="checkbox"/>	EXTEM MCF	* (H) 77
<input type="checkbox"/>	EXTEM ML	* 5
Fibtem		
<input type="checkbox"/>	---	---

Normal approximately 5-15

? Fibrinolysis Shutdown



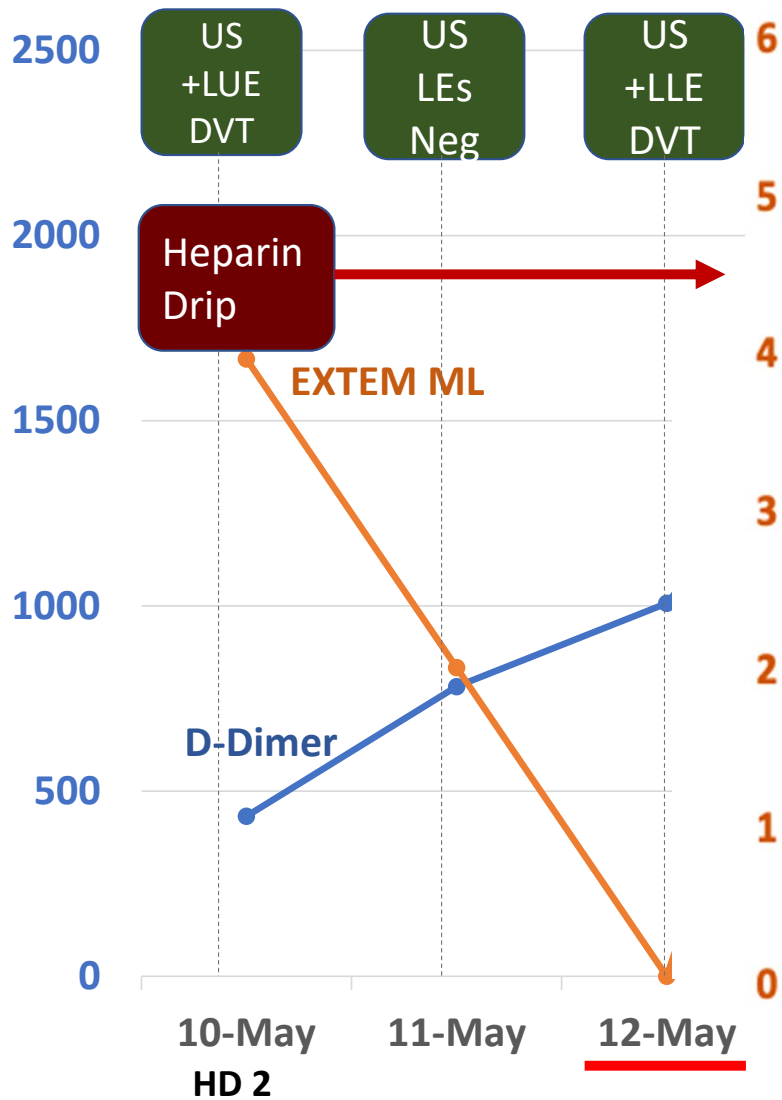
Does your institution have a protocol for giving higher than prophylactic doses of AC for COVID patients?

A. Yes, based on D-dimer

B. Yes, based on a different lab(s)

C. Yes, based on severity of illness (e.g. ICU)

D. No



May 12th (HD #4)

FiO₂ 60% → 100%

PEEP 12 → 18

Tachycardia

POCUS- enlarged RV

Hg 12

Plt 267

INR 1.4

Anti-Xa level 0.77 (on hep gtt)

CRP 264

Fibrinogen 642

Plasma viscosity normal

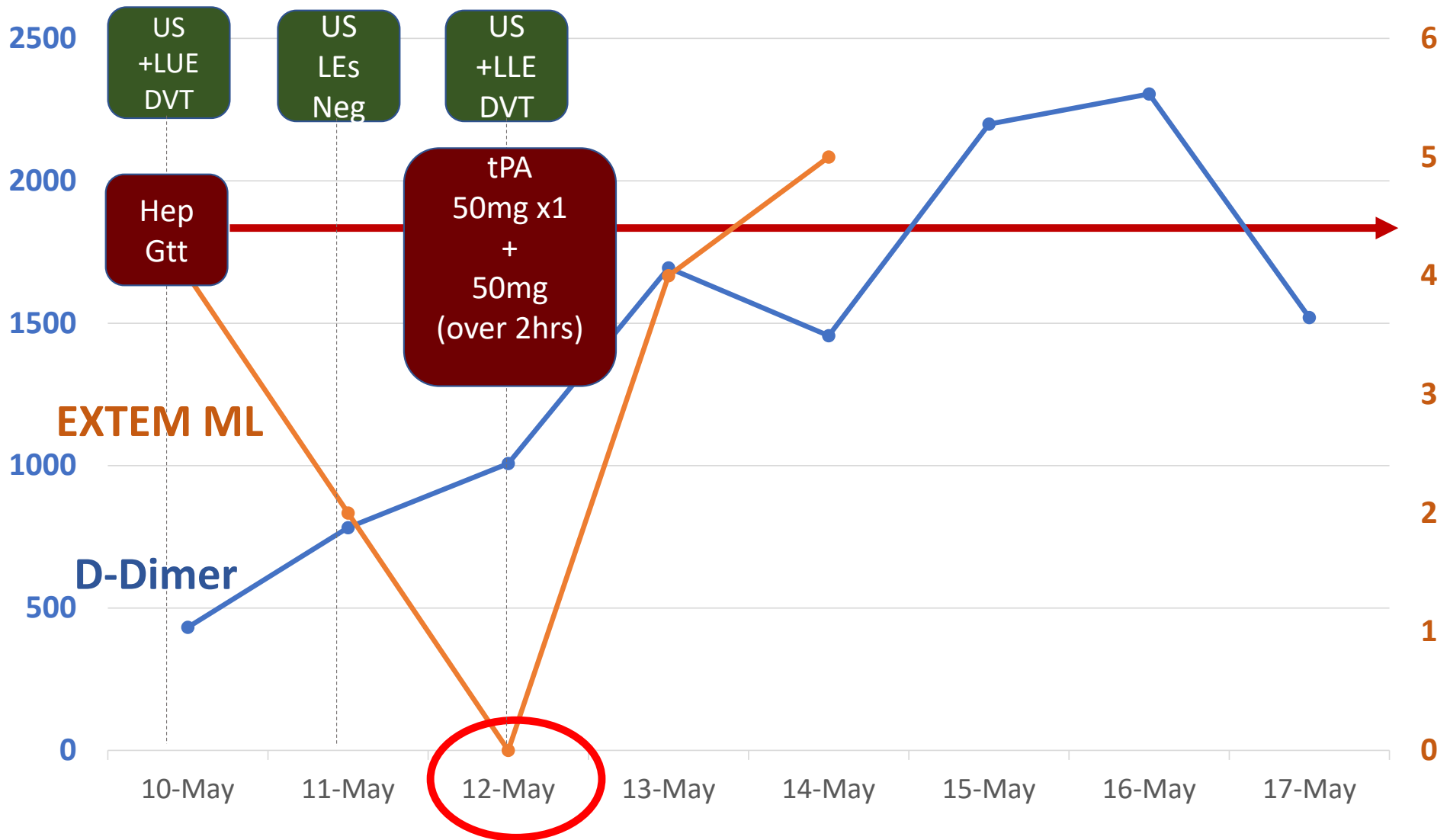
Next Step in Management?

A. Switch from heparin to a different anticoagulant

B. tPA

C. Therapeutic Plasma Exchange (TPE)

D. No change in management



Case #1 Update



- Oxygen requirements improved over time, extubated on 5/20 (HD #11)
- Transferred to the floor 5/25, shortly after transferred home
- Complete renal recovery now off CRRT
- Discharged on apixaban

Case #2



- 58yoM with T2DM, obesity
- Presented with 1 week of fevers, chills, cough
- SARS-CoV-2 (+)
- Intubated in the ED for respiratory distress and hypoxemia refractory to NRB

Case #2

ICU Course



- Severe ARDS (P/F 87 on 100% FiO₂, 18 PEEP)
 - Paralysis
 - Proning
 - Inhaled epoprostenol
 - Empiric treatment for PNA
- Severe ileus/distention limited further proning
- AKI (Cr peak 2.3 from baseline 0.6)

Case #2

ICU Course



Monitored Coagulopathy/Inflammation Labs

D-dimer
Fibrinogen
CRP
INR, PTT
Platelets

AT-III levels
Anti-Xa levels

Measures of fibrinolysis (TEG, ROTEM)
Plasma viscosity (normal 1.4-1.8 cP)

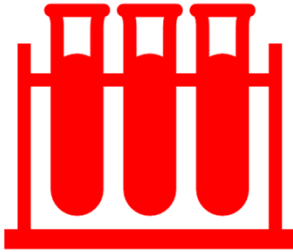
Why measure plasma viscosity in COVID?



Inflammation



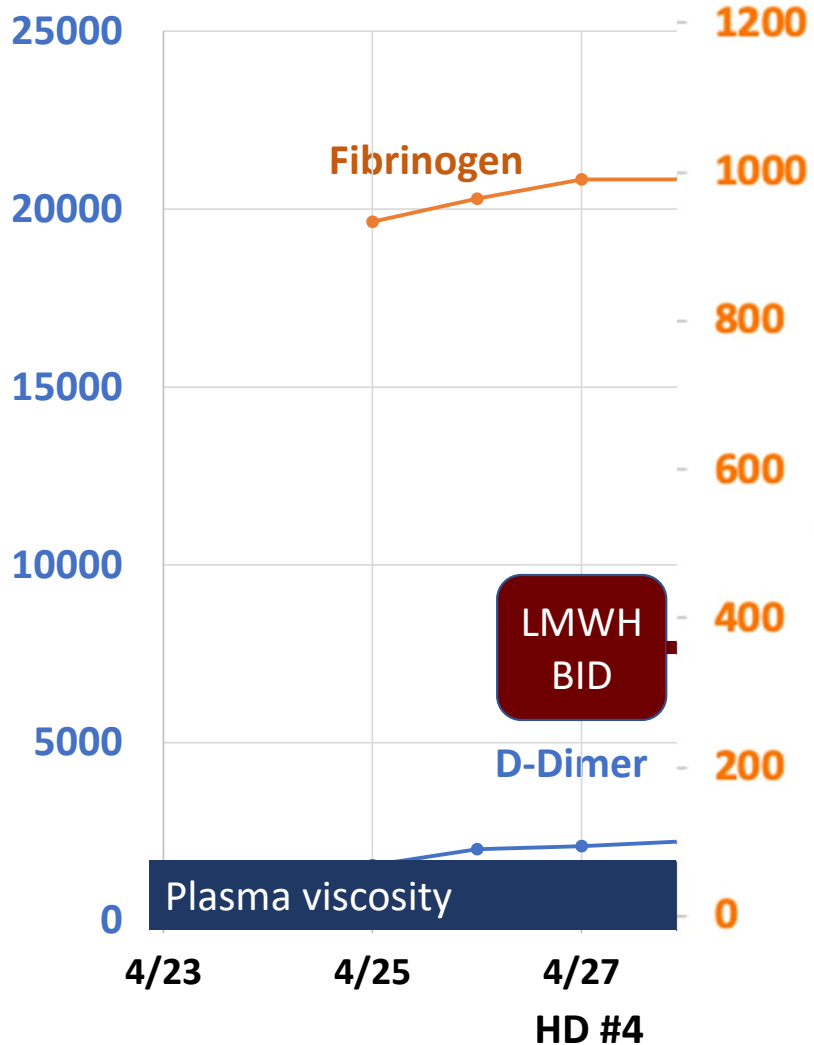
Fibrinogen
Immunoglobulins
Cytokines



Hyperviscosity



Increased risk
VTE



May 3 (HD #10)

FiO2 70%
 PEEP 14
 P/F <100

Hg 9
 Plt 607
 INR 1.1
 Anti-Xa level therap.
 CRP 260
 EXTEM ML 9 (nl)

Bedside Ultrasound Femoral Vein



Spontaneous Echo Contrast (SEC)

- AKA “Smoke”
- Echogenicity of blood in absence of contrast
- Optimize gain to measure

Is bedside POCUS (point of care ultrasound) a routine part of your assessment for VTE/coagulopathy in COVID patients?

A. Yes

B. No

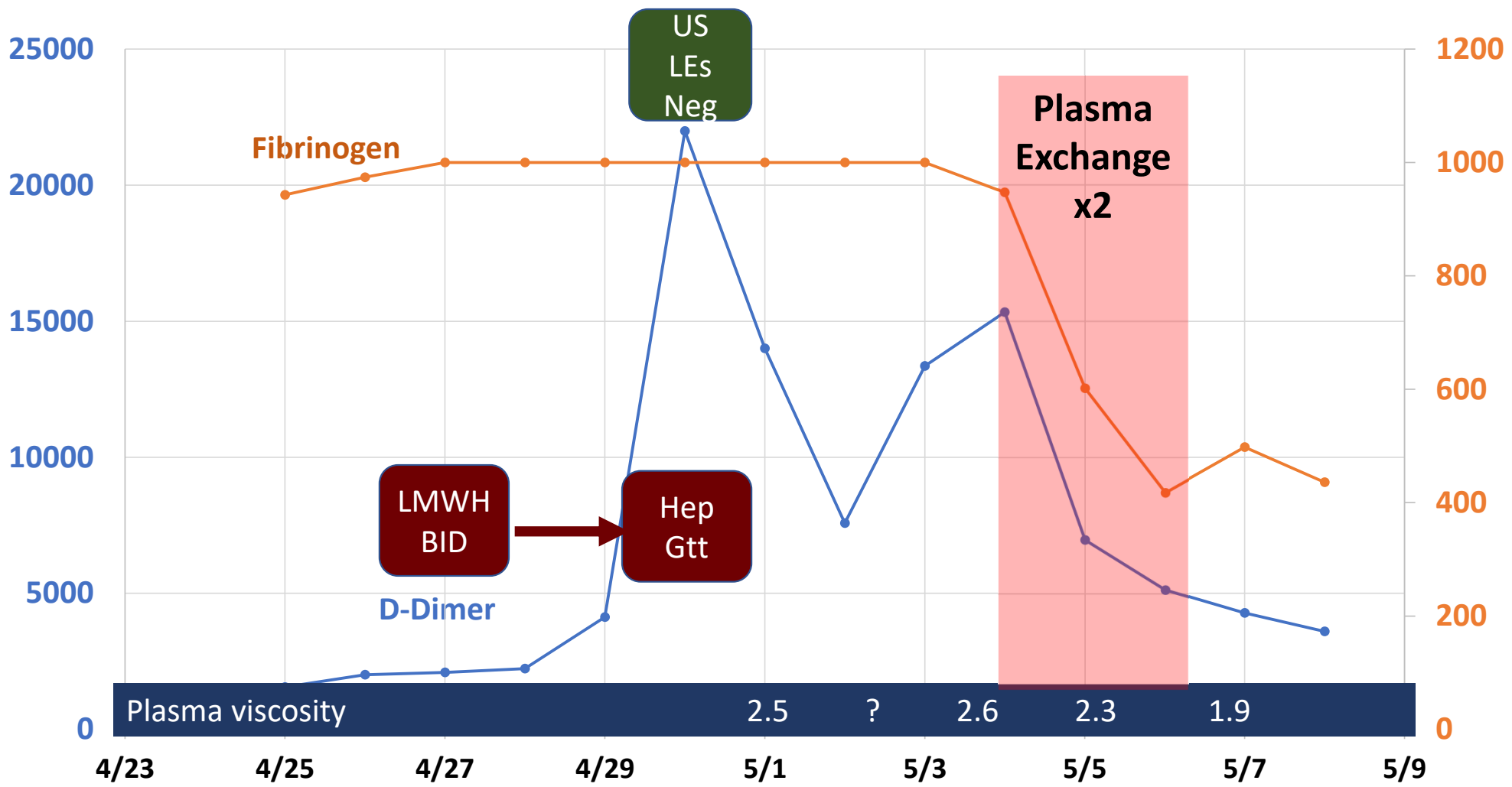
Next Step in Management?

A. Switch from heparin to a different anticoagulant

B. tPA

C. Therapeutic Plasma Exchange (TPE)

D. No change in management



Case #2 Update



- Decreasing requirements of FiO₂ and PEEP
 - Extubated 5/9 (HD #16, 4 days after TPE started)
- Cr returned to baseline
- Discharged to inpatient rehab, then home 2 weeks later
- Completed a 4-week course of apixaban outpatient

Does your institution have a process for follow up of COVID patients discharged on anticoagulation?

A. Yes, PCP

B. Yes, specialty clinic (pulmonary, hematology, AC clinic)

C. Yes, designated post-COVID clinic

D. No