Coagulation Interpretation Using a Web-based Reporting System

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Background

Web-based synoptic reporting systems have been successfully integrated into diverse fields of pathology. They improve efficiency and reduce typographic errors. Coagulation can be a challenging field for both practicing pathologists and trainees alike. A program that assists in formulating the best possible report in a short amount of time serves as both an educational tool for residents and a time management resource for practicing pathologists.

Design

We have developed a web-based synoptic reporting system composed of 118 coagulation report templates and 27 thromboelastograph report templates covering a wide range of findings (www.hemepathreview.com). The interactive coagulation panels consist of 29 findings which can be selected alone or in any combination. They include mixing study for PT/PTT, platelet aggregations, factor inhibitor screens, von Willebrand panel, and lupus anticoagulant (figure 1). The TEG panel allows for the selection of normal, low or high values for TEG parameters (figure 2). Once the selections are made, the report templates are displayed in a text window for editing.

Mixing Study for PT/PTT:		Factor VIII Inhibitor Screen:	
Factor VII deficiency:	☑	Negative for F VIII inhibitor:	☐
Factor deficiency in the intrinsic pathway:	☐	Positive for F VIII inhibitor:	☐
Factor deficiency in the common pathway and/or in both intrinsic and extrinsic pathways:	☐		
Factor inhibitor in the intrinsic pathway:	☐	Factor IX Inhibitor Screen	
Factor inhibitor cannot be ruled out:	☐	Negative for F IX inhibitor:	☐
Coumadin and Heparin effect or direct thombin inhibitor:	☐	Positive for F IX inhibitor:	☐
Heparin effect	☐		
		Vonwillebrand Panel	
Platelet Aggregation		Negative for vWD	☐
Non-diagnostic due to thrombocytopenia, lipemia, or hemolysis	☐	Negative for vWD, positive for Hemophilia A	☐
No evidence of platelet dysfunction	☐	Positive for vWD	☐
NSAID effect	☐		
Other medication effect/MPD/SPD/Glanzmann's	☐	Lupus Anticoagulant Panel	
Plavix effect vs. ADP receptor defect	☐	Negative for lupus anticoagulant with normal dRVVT:	☐
Uremia effect or high gamma globulin level	☐	Negative for lupus anticoagulant with prolonged dRVVT:	☐
		Positive for lupus anticoagulant with normal dRVVT:	☐
Heparin-Induced Platelet Aggregation		Positive for lupus anticoagulant with prolonged dRVVT:	☐
Negative for heparin-associated antibody	☐	Non-diagnostic for lupus anticoagulant	☐
Negative for heparin-associated antibody with spontaneous platelet aggregation	☐		
Positive for heparin-associated antibody	☐		
Non-diagnostic results due to spontaneous platelet aggregation	☐		

Get report now | Help

DRAFT FOR COAGULATION REPORT:

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Baseline PT is slightly prolonged, corrected with mixing. Thrombin Time is
normal at 16.2 sec. Impression: mild Factor VII deficiency (as seen in vitamin
K deficiency, or liver disease). Clinical correlation is suggested. CPT: 85390
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Baseline PT is prolonged, corrected with mixing. Thrombin Time is normal at
15.6 sec. Impression: Factor VII deficiency (as seen in vitamin K deficiency,
coumadin treatment, or liver disease). Clinical correlation is suggested. CPT:
85390
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```

Clear Window | Start Over

FINAL DRAFT:

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Baseline PT is prolonged, corrected with mixing. Thrombin Time is normal at
15.6 sec. Impression: Factor VII deficiency (as seen in vitamin K deficiency,
coumadin treatment, or liver disease). Clinical correlation is suggested. CPT:
85390
```

Clear Window | SELECT ALL

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Fig. 1 Coagulation Panel

Enter TEG Data [ref range for citrated whole blood]:

R [5-10 min]:	○ Normal |	○ Low |	◉ High
Alpha [53-72 deg]:	○ Normal |	◉ Low |	○ High
MA [50-70 mm]:	○ Normal |	◉ Low |	○ High
LY30 [0-8 %]:	◉ Normal |	○ N/A |	○ High

Notes:
Normal-in normal range or borderline
Low-significantly decreased
High-significantly increased

Diagnose now | Start Over | Help

LIST OF DIFFERENTIAL DIAGNOSES:

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decreased value of MA and Angle Alpha.  This finding is suggestive of defects
in both primary hemostasis (platelets) and secondary hemostasis (clotting
factors).  Transfusion with multiple blood components are suggested: fresh-
frozen plasma  (10-20 mL per Kg body weight, or 4-6 units for an average
adult), cryoprecipitate (6 units per 70 Kg body weight), and platelets (6
units per 70 Kg body weight).
CPT:85390
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Thrombelastograph results show markedly prolonged value of R, markedly
decreased value of MA and Angle Alpha.  This finding is suggestive of
hypocoagulable state in DIC. Transfusion with FFP (2 units/70 Kg BW), Cryo (6
units/70 kg BW), and platelets (6 units/70 kg BW).
CPT:85390
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Fig. 2 TEG Panel

Results

This web-based reporting system was put into place and used by residents on hematopathology starting July 2011. All reports were reviewed by faculty for accuracy and typographical errors before final verification. Evaluation via survey of the program by 24 residents and 2 attending pathologists has been unanimously positive. All reported this reporting system greatly improved turnaround time and accuracy. Typographic, grammatical errors, and exclusion of important information in the drafts were also decreased.

Conclusions

An easily accessible, user-friendly, and web-based synoptic reporting system for coagulation can be an asset to pathologists at any level of training. Survey data indicate that the program improves efficiency by saving time and reducing errors.

References

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