A PILOT STUDY EVALUATING THE CORRELATION OF SEER SONORHEOMETRY WITH ROTEM IN OBSTETRIC HEMORRHAGE

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Background

- Sonic Estimation of Elasticity via Resonance (SEER) Sonorheometry is a novel VET modality, utilized by the cartridge-based Quantra® Hemostasis Analyzer.
- Limited evaluation in obstetric hemorrhage patients

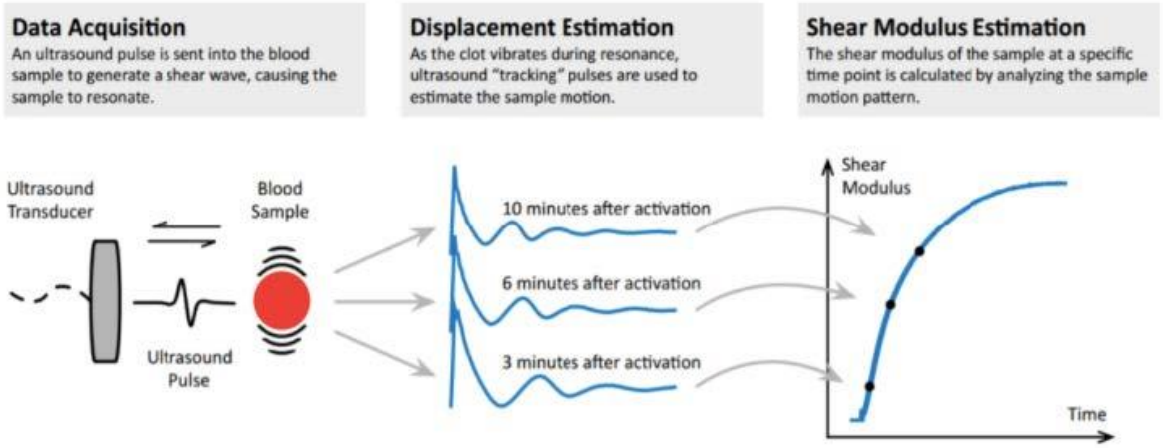

Figure 1. Principle of SEER Sonorheometry

Study Aim

- To determine the correlation of SEER-based Quantra® QStat cartridge parameters with those obtained from the ROTEM® delta and other lab-based coagulation assays used as standard of care in obstetric hemorrhage at our facility.

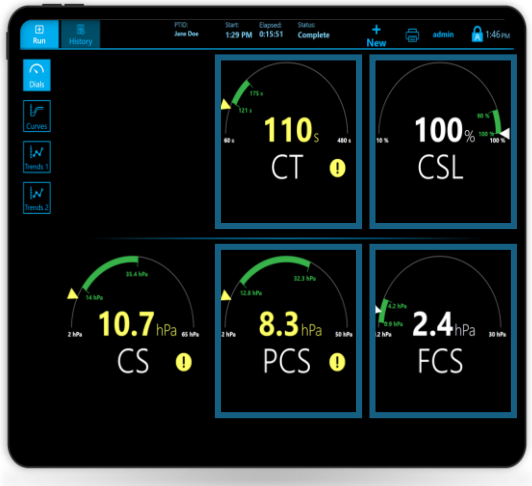

Figure 2. Dial output screen of the Quantra Hemostatic Analyzer

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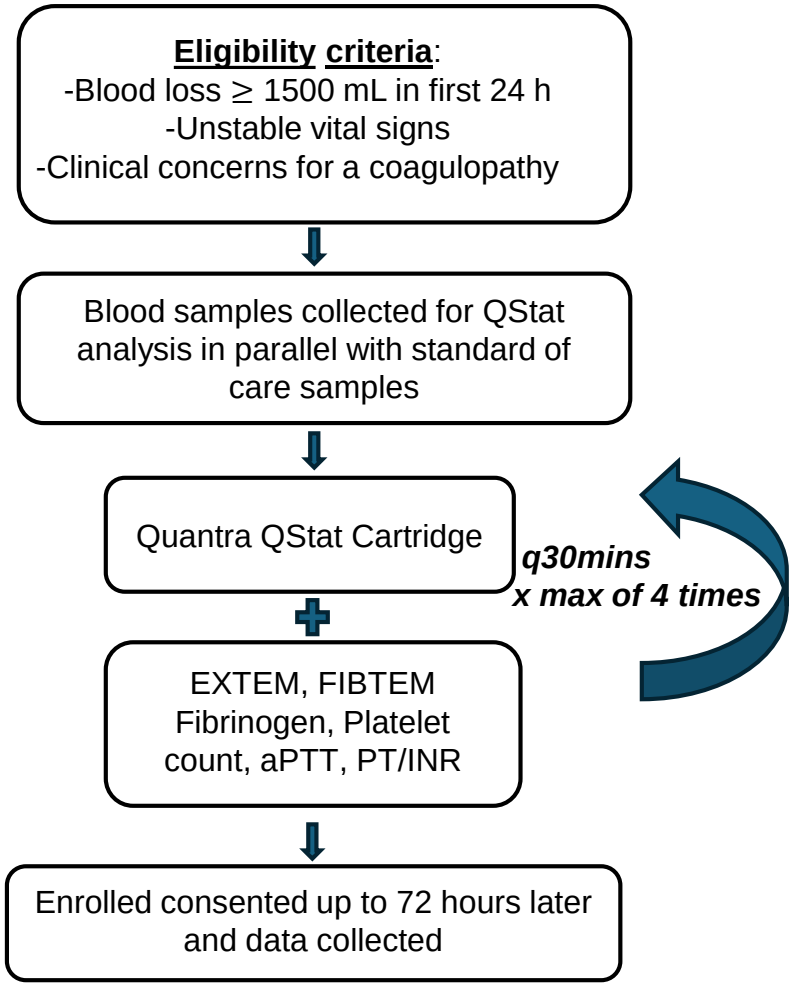
STUDY DESIGN AND METHODS



- Projected sample size goal: 50 patients
- Data collected
  - Demographic
  - Obstetric comorbidities
  - Transfusion data
  - hemorrhage-related outcome
- Pearson's correlation to assess the correlation between:
  - Clot Stiffness **(CS)** vs EXTEM A10 and A20
  - Fibrinogen Contribution to Clot Stiffness **(FCS)** vs FIBTEM A10 and A20
  - Platelet Contribution to Clot Stiffness **(PCS)** vs PLATEM=EXTEM A20-FIBTEM A20
  - **PCS** vs Platelet count
  - Clot time **(CT)** vs aPTT
- Clinical concordance analysis to assess agreement between Extem ML and Qstat Clot Stability to Lysis **(CSL)** (fibrinolysis parameters)

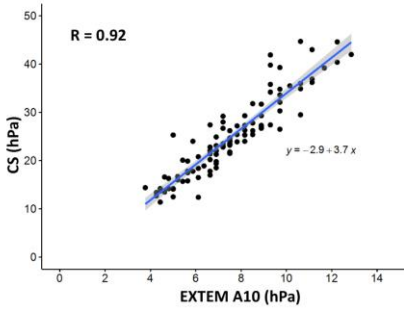
Results

Demographic data (n=50)	
Age (years)	33 (30, 37)
BMI (kg/m^2)	32 (29, 39)
Race	
White	28 (56%)
Black	18 (36%)
Asian	4 (8%)
Gestational Age (weeks)	37 (36, 39)
Prior pregnancies	1 (1,3)
Prior Births	0 (0,1)
Cesarean Section	72%
Labor augmentation	28 (56%)
Multiple Gestation	3 (6%)
Gestational Diabetes	7 (14%)
Preterm Births	13 (26%)
Preeclampsia	12 (24%)
Chorioamnionitis	4 (8%q)

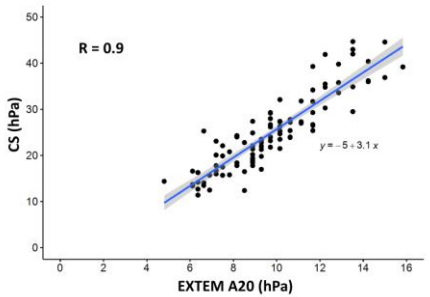
Hemorrhage management (n=50)	
2nd line uterotonic administered	38 (76%)
Balloon tamponade	16 (32%)
Uterine compression sutures	5 (10%)
Hysterectomy	3 (6%)
Uterine artery ligation	1 (2%)
ICU admission	3 (6%)

Hemorrhage etiology (n=50)	
Uterine Atony	26 (52%)
Placenta Accreta Spectrum	4 (8%)
Surgical Bleeding	16 (32%)
Coagulopathy	1 (2%)
Genital Tract Laceration	8 (16%)
Retained Placenta	5 (10%)
Unknown	1 (2%)

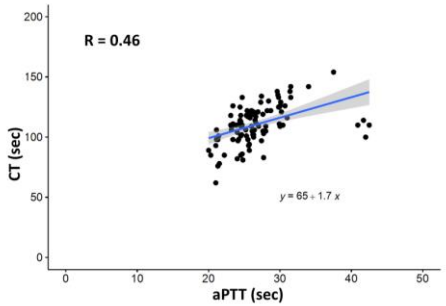
Transfusion Data (n=50)	
Quantitative blood loss (mL) *(Q1,Q3)*	1828 *(1566, 2325)*
Transfused PRBCs	29 (58%)
Transfused Plasma	1 (2%)
Transfused Cryoprecipitate	7 (14%)
Transfused Platelets	1 (2%)
Tranexamic acid administered	49 (98%)
Received fibrinogen concentrate	5 (10%)



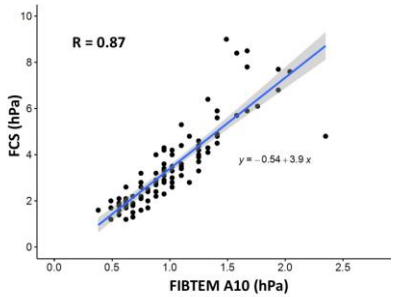
CS vs EXTEM A10



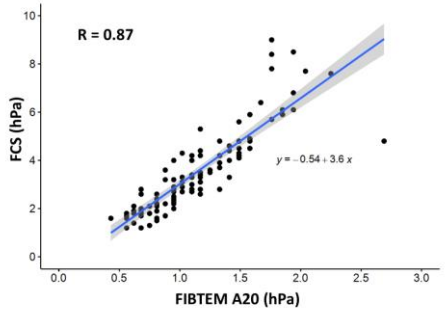
CS vs EXTEM A20



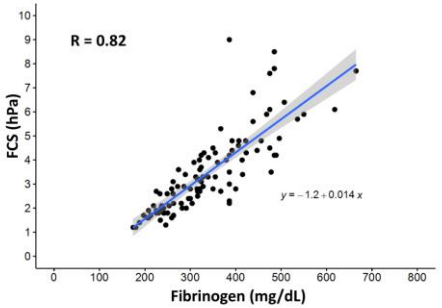
CT vs aPTT



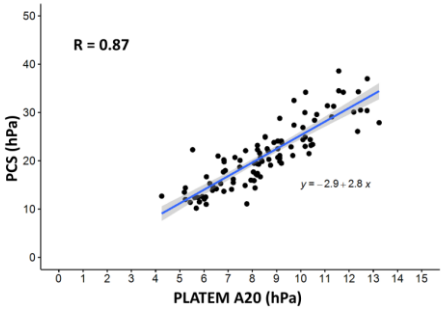
FCS vs FIBTEM A10



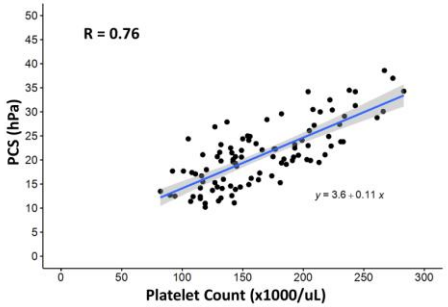
FCS vs FIBTEM A20



FCS vs Fibrinogen



PCS vs PLATEM A20



PCS vs Platelet Count

Overall agreement 84.3%		EXTEM ML>15%	
		Positive	**Negative**
Qstat CSL>5%	**Positive**	0	0
	Negative	11	59

Clinical concordance between Qstat CSL and EXTEM for detecting hyperfibrinolysis

Conclusion

- In obstetric hemorrhage patients the QStat SEER derived parameters of clot stiffness demonstrated strong correlation with
  - Analogous ROTEM derived parameters of clot strength
  - Fibrinogen levels
  - Platelet count
- QStat SEER derived CT was only weakly correlated with aPTT
- The Qstat cartridge is a viable alternative viscoelastic testing device in managing obstetric hemorrhage patients

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