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Feasibility and Challenges of Performing the Detailed First Trimester Scan for MFM Fellows

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Background

We sought to assess feasibility and challenges associated with learning FT ultrasound as the transition of proficiency from 2nd trimester remains unknown.

Method

Prospective study in a single institution by a 3rd year MFM fellow with experience in 2nd trimester anatomical surveys. Structured weekly didactic, hands-on training with feedback was provided over 4 weeks. *This project was part of GOHO Memorial Foundation Beryl Benacerraf sponsored visiting US fellowship grant.*

Results

A total of 44 scans were done: 86% TA, 14% TA and TV. Mean BMI was 28.3 kg/m², CRL was 69.8 mm. Average completion time was 42.9 min with completion of all planes in 41%.

Easy planes (completion rate 100 %)	Moderate difficulty planes (completion rate >90 %)	Challenging planes (completion rate < 90%)
Situs	Butterfly view	Renal arteries with color Doppler
Abdominal wall/cord insertion	Cardiac axis	Nuchal translucency NT
Bladder	Stomach	TR with spectral Doppler
Bladder 3VC with color Doppler	Diaphragm	3VTV with color Doppler
UE arms	Spine sagittal plane	Hands/Feet
LE legs	4 chamber view	DV with spectral Doppler
	4 chamber with color Doppler	
	Orbits	
	Intracranial translucency IT	
	Nasal bone NB	
	Kidneys in coronal plane	
	Retronasal triangle RNT	
	Mandibular gap	
	Maxilla	

Table 1. Completion rate of individual planes

The easiest planes to obtain were situs, abdominal wall, bladder, arms/legs. The most challenging planes were DV (69.8%) and feet/hands (74.4%) (Table 1).

BMI category, kg/m2	Rate of completion, %	P-value	
20-29.9	68	***0.007***	
30-34.9	20		
> 35	14.3		***0.017***

Table 2. BMI and the success of FT scan completion

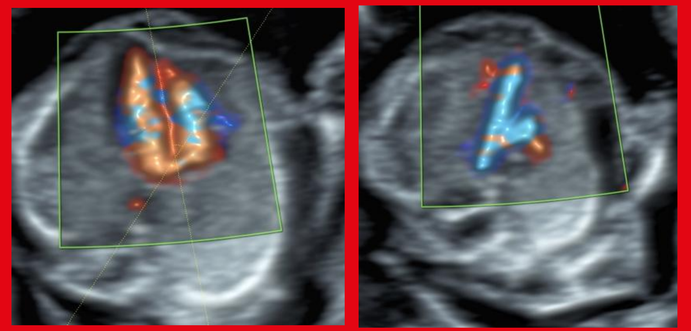
Completion of FT scan was possible in 68% with BMI < 30kg/m2 vs 17.6% with BMI > 30kg/m2 (p=0.0017) and it decreased with increasing BMI (p=0.007) (Table 2). Rate of completion increased with CRL from 25% to 63% (p<0.0007) for CRL less or above 70mm (Table 3). Time of completion improved with experience: 46.9min scans 1-22 vs 39.1min scans 23-44 (p=0.03).

CRL, mm	Proportion of cases within given CRL category, %	Rate of completion FT scan, %		P-value
50-59	18.6	25	25	***0.0007***
60-69	37.2	25		
70-79	27.9	58	63.2	
>80	16.3	71		

Table 3. CRL and the success of completion of FT scan

Conclusion

- Performance of FT ultrasound is a feasible skill to develop during MFM fellowship.
- The most difficult planes are those that require the use of color or spectral Doppler.
- Fetal CRL, maternal BMI, and gained experience are the most impactful factors.



Four-chamber View with Cardiac Axis and Three-vessel Trachea View with Color Doppler



Midsagittal Plane with Color Doppler