MFM Ultrasound Program
MFM Fellowship

UNM MFM Global Fellowship General Description:

- Fellows complete six months of dedicated diagnostic perinatal ultrasound didactic sessions (240 hours) and supervised clinical experience throughout MFM Fellowship
- The six months are scheduled throughout the first year with additional dedicated time in perinatal imaging and scheduled clinic throughout the remaining two years of Fellowship
- Fellows complete the Beginning and Intermediate Competencies established by Dr. Hall by the end of Year I and the Advanced competencies by the end of the Fellowship
- Fellow are be responsible to make presentations on assigned U/S topics

Goals:

- Pre-test for incoming Fellow I
- Cross-sectional anatomy is taught an ongoing didactic component throughout the fellowship
- Physics / Instrumentation
    - Knobology
    - Doppler Instrumentation
    - Bioeffects
- Detailed didactics regarding the following categories are covered:
    - 1st timester examination
        - Embryology
        - EV exam
        - Nuchal translucency
    - 2nd-3rd Trimester examination
        - Biometrics
        - Biometrics Ratios
        - BPP/AFI
        - AIUM/ACOG suggested Protocol
        - Placenta
        - IUGR
        - Fetal vascularity

        - Chest, Cardiac, GI-GU, Skeletal)
            - Embryology
            - Normal
            - Pathologies
            - Differential Diagnosis
- Syndromes
- Trisomies
- Case Review
- Research

Each fellow will take a two hour comprehensive written examination during their first year of fellowship. Additionally, there will be ongoing clinical Board Review case assessment in preparation for their MFM Board exams, as well as the Ob/Gyn, Physics and Fetal Echo ARDMS boards that are expected to be taken by each fellow.

Objectives

A. Medical Knowledge:

- Discuss physician training requirements to perform diagnostic sonology
- Discuss basic physics concepts in diagnostic ultrasound
- Describe and perform detailed 2D and 3D instrumentation techniques to modify and enhance imaging assessment
- Utilize first steps toward examination assessment and diagnostic interpretation
- Define the most important instrumentation tools for ultrasound assessment
- Recognize examples of appropriate and inappropriate use of each tool
- Use the described "knobology" to apply immediate tasks
- Understand the unique changes per week of embryologic development
- Understand the correlative hCG levels associated with each week of development
- Recognize the components for the most common first trimester pathologic entities, including ectopic gestation, subchorionic bleed and normal pregnancy with concomitant extra-uterine findings
- Describe: AIUM, ACR and ACOG expected protocol for second and third trimester imaging for the normal pregnancy
- Describe "how to perform" the expected parameters and anatomic fetal evaluation
- Describe biometric ratios and how they are utilized in overall fetal assessment
- Describe normal and cross-sectional neuroanatomy
- Describe **CNS** embryology and progressive fetal anatomic
- changes throughout pregnancy
- Utilize multiple planes to assess normal development
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the DDx

- Consider associated findings when fetal neuroanatomy
- is abnormal
- Describe normal and cross-sectional fetal abdominal and pelvic anatomy
- Describe **GI-GU** embryology and progressive fetal abdominal and pelvic anatomic changes throughout pregnancy
- Utilize multiple planes to assess normal development
- Consider associated findings when fetal abdominal and pelvic anatomy is abnormal
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the differential diagnosis.
- Describe embryology and progressive fetal abdominal and pelvic anatomic changes throughout pregnancy
- Utilize multiple planes to assess normal development
- Consider associated findings when fetal abdominal and pelvic anatomy is abnormal
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the differential diagnosis.
- Describe normal and cross-sectional fetal cardiac anatomy
- Describe **CVS** embryology and progressive fetal abdominal and pelvic anatomic changes throughout pregnancy
- Utilize multiple planes to assess normal development
- Consider associated findings when fetal cardiac anatomy is abnormal
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the DDx
- Describe normal and cross-sectional fetal skeletal anatomy
- Describe **Skeletal** embryology and progressive fetal skeletal anatomic changes throughout pregnancy
- Utilize multiple planes to assess normal development
- Consider associated findings when fetal skeletal anatomy is abnormal
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the DDx

- Understand the components of a complete pelvic gyn and pelvic floor urogyn ultrasound examination
- Describe and perform 2D and 3D instrumentation techniques to modify and enhance imaging assessment
- Consider associated findings when the adult female pelvic and pelvic floor anatomy is abnormal
- Create an imaging differential diagnosis for abnormal findings and determine characteristics to narrow the DDx
- Understand the utility of Doppler and spectral waveform assessment in evaluation of the uterine arteries, umbilical arteries, MCA, DV and all other vessels for fetuses with IUGR, systemic infections, cardiac disease and fetal abnormalities
- Perform detailed color power Doppler and spectral waveform analysis of any of the above categories of fetal assessment and describe the clinical utility

B. Patient Care:

Upon completion of the ultrasound program, fellows will be able to

1. Perform detailed fetal anatomic survey in the second and third trimester of pregnancy according to AIUM guidelines
2. Perform targeted second and third trimester ultrasound examination of fetal anatomy in instances of suspected fetal anomalies.
3. Perform uterine, umbilical artery, middle cerebral artery, and ductus venosus Doppler studies
4. Evaluate transvaginal cervical length
5. Evaluate placentation with special reference to disorders of invasive placentation

C. Practice Based Learning:

1. Demonstrate ability to perform self-assessment and incorporate feedback into improving ultrasound skill and practice

2. Critically analyze and understand the appropriate use of the ultrasound and clinical management plans formulated and identify areas for improvement.

3. Understand and describe ultrasound techniques and modalities for which there is evidence-base for clinical benefit versus emerging technologies that remain investigational.

3. Use information technology to locate scientific studies from the literature on the test characteristics (sensitivities/specificities, positive, and negative predictive value)

of various ultrasound technologies and apply these to improve practice and patient care.

D. **Interpersonal and Communication Skills:**

1. Demonstrate ability to communicate test results to patients and families
2. Use effective listening skills to elicit and then provide information to patients and families
3. Work effectively, interact, and communicate appropriately with referring providers.
4. Learn to communicate ultrasound findings in a manner that is understandable to patients and families.
5. Learn to differentiate communication of ultrasound findings of major anomalies from communication of findings such as “soft” markers for aneuploidy.

E. **Professionalism:** Fellows are expected to:

1. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population
2. Demonstrate respect, compassion, and integrity in interactions with patients, families, and other health care professionals
3. Demonstrate sensitivity and responsiveness to patient’s culture, age, gender, and disabilities

F. **Systems-Based Practice:**

1. Practice cost-effective healthcare and demonstrate knowledge of resource allocation that does not compromise quality of care, especially in the ultrasound technology.