Origins of Prenatal Care

• The traditional form of antenatal care developed in the early 1900s
  • Most women delivered at home with an unskilled attendant
Origins of Prenatal Care

• In the early 1900s, > 6/100 women died in childbirth

• “Hat trick” of maternal mortality:
  • Hemorrhage
  • Infection (“childbed fever”)
  • Toxemia (preeclampsia and eclampsia)
Origins of Prenatal Care

• “Modern prenatal care” was born in the early 1900s
  • Non-evidence based approach, serial assessment as a core tenant, primarily intended to diagnose PRE-eclampsia

• In the 100 years that followed:
  • Maternal and infant mortality dropped by over 90%
Maternal & Infant Mortality

We now sit at ~25 maternal deaths/100,000 births.
Prenatal Care in the U.S.

• With nearly 4 million births annually, prenatal care is one of the most widely used preventative health care strategies.
Prenatal Care in the U.S.

• Despite its near ubiquitous practice, the optimal quantity and character of prenatal care remains controversial
  • Paucity of randomized trials
  • Questions of optimal quantity, efficacy of its individual components, efficiency and cost-effectiveness remain
Objectives

1. Review current recommendations regarding evidence-based prenatal care
2. Understand emerging best practices
3. Discuss barriers to implementation (a.k.a. battling dogma)
“The specific content and timing of prenatal visits, contacts, and education should vary depending on the risk status of the pregnant woman and her fetus.”
1989: U.S. Department of Health and Human Services

Caring for our Future: The Content of Prenatal Care
Report of the Public Health Expert Panel on the Content of Prenatal Care

Proposed reduced frequency prenatal schedule for low-risk parous women based on the timing of specific events and tests that occur in pregnancy.
Proposed reduced frequency prenatal schedule for low-risk parous women based on the timing of specific events and tests that occur in pregnancy.

Reduced recommended visits from 14 to 8.
And absolutely nothing changed.
What should we be doing?

Guidelines:

U.S. Department of Health and Human Services
American Congress of Obstetricians & Gynecologists (ACOG)
American Academy of Pediatrics (AAP)
Institute for Clinical Systems Improvement (ICSI)
Department of Defense and Veterans Administration (DoD & VA)
What should we be doing?

**Guidelines:**

- All recommend a system of goal-oriented antenatal visits at specific gestational ages
- Endorse a reduced schedule of prenatal visits compared to traditional models for low-risk women
Is it safe to do fewer visits?

Systematic review of 7 RCTs:

• Reduced prenatal care model (4-9 visits) vs. standard care (13-15 visits)

• >60,000 low-risk women, spectrum of resource settings

Carroli et al. WHO systematic review of randomized controlled trials of routine antenatal care. Lancet 2001;357:1565-70

Is it safe to do fewer visits?

Systematic reviews of 7 RCTs:

• No difference in maternal or perinatal morbidity / mortality
• Particularly when there were at least 5 visits

Carroli et al. WHO systematic review of randomized controlled trials of routine antenatal care. Lancet 2001;357:1565-70

What about patient satisfaction?

Systematic reviews of 7 RCTs:

• Women in all settings were generally less satisfied with the reduced visit schedule and the gap between care provider contacts

Carroli et al. WHO systematic review of randomized controlled trials of routine antenatal care. Lancet 2001;357:1565-70

‘One Size Fits All’ Prenatal Care

• Despite compelling safety and efficacy data, prenatal care practices in the U.S. have generally continued a ‘one size fits all’ approach
‘One Size Fits All’ Prenatal Care

• Concerns have limited widespread use of a reduced prenatal care visit model
  • Patient satisfaction
  • Fear of liability
  • Obstetric dogma
DOGMA

...cannot be changed or discarded without affecting the very system’s paradigm...
How do you move toward an evidence-based prenatal care model with fewer visits but retain patient and provider satisfaction?
What baby step can we take?
The New Modern

• **Telemedicine Prenatal Care Programs**
  
  • Reduce the number of face-to-face visits, but keep a similar number of contacts with a provider for satisfaction
  • Face-to-face visits provide “goal-oriented visits”
    • Labs, ultrasound, physical exam

**Mayo Clinic OB Nest Program**

**University of Utah Health Virtual Prenatal Care Program**
Comparison of Randomized Trials of Telemedicine for Prenatal Care

<table>
<thead>
<tr>
<th></th>
<th>Mayo Clinic OB NEST</th>
<th>University of Utah Health Virtual Prenatal Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment</td>
<td>300</td>
<td>200</td>
</tr>
<tr>
<td>Subjects</td>
<td>Low-risk, excluding all medical comorbidities</td>
<td>Low-risk, excluding all medical comorbidities</td>
</tr>
<tr>
<td>Parity</td>
<td>Primiparas or multiparas</td>
<td>Limited to multiparas</td>
</tr>
<tr>
<td>Usual care</td>
<td>12-14 visits</td>
<td>12-14 visits</td>
</tr>
<tr>
<td>Face-to-face visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study group</td>
<td>8 visits</td>
<td>5 visits</td>
</tr>
<tr>
<td>Face-to-face visits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Comparison of Randomized Trials of Telemedicine for Prenatal Care

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<tr>
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<th>Mayo Clinic OB NEST</th>
<th>University of Utah Health Virtual Prenatal Care</th>
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</thead>
<tbody>
<tr>
<td><strong>Telemedicine provider</strong></td>
<td>Study RN</td>
<td>Patient’s physician or CNM</td>
</tr>
<tr>
<td><strong>Home monitoring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fetal monitor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Weight</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Access to online care</strong> (patient portal)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Intent to treat</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Primary outcome</strong></td>
<td>Patient satisfaction</td>
<td>Patient satisfaction</td>
</tr>
</tbody>
</table>
Clinic Schedule: Virtual Care Arm

- 5 scheduled *in-clinic* visits
  - *Key time points for evidence-based interventions*
- Remaining visits *virtual*

<table>
<thead>
<tr>
<th>First prenatal visit</th>
<th>16 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 weeks</td>
</tr>
<tr>
<td></td>
<td>24 weeks</td>
</tr>
<tr>
<td></td>
<td>28 weeks</td>
</tr>
<tr>
<td></td>
<td>30 weeks</td>
</tr>
<tr>
<td></td>
<td>32 weeks</td>
</tr>
<tr>
<td></td>
<td>34 weeks</td>
</tr>
<tr>
<td></td>
<td>36 weeks</td>
</tr>
<tr>
<td></td>
<td>37 weeks</td>
</tr>
<tr>
<td></td>
<td>38 weeks</td>
</tr>
<tr>
<td></td>
<td>39 weeks</td>
</tr>
</tbody>
</table>
Virtual Prenatal Care Strategy
# Your Prenatal Care Visit Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Visit Type</th>
<th>Survey/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Remote Visit</td>
<td>Remote Care Experience</td>
</tr>
<tr>
<td>20</td>
<td>In-Person Visit</td>
<td>Survey: Satisfaction, Preference, Cost</td>
</tr>
<tr>
<td>24</td>
<td>Remote Visit</td>
<td>Survey: Cost</td>
</tr>
<tr>
<td>28</td>
<td>In-Person Visit</td>
<td>Survey: Cost</td>
</tr>
<tr>
<td>30</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>32</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>34</td>
<td>In-Person Visit</td>
<td>Survey: Satisfaction, Preference, Cost</td>
</tr>
<tr>
<td>36</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>37</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>38</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>39</td>
<td>Remote Visit</td>
<td>Survey: None</td>
</tr>
<tr>
<td>40+</td>
<td>In-Person Visit</td>
<td>Survey: Satisfaction, Preference, Remote Care Experience</td>
</tr>
</tbody>
</table>

**Visit Checklist**

1. **Before Each Visit**
   - Measure your blood pressure, weight, & your baby's heart rate.
   - Record these measurements in MyChart (https://mychart.medicine.uh.edu/mychart/)
2. **Remote Visits Only**
   - Go to your doctor's ePrenatal menu*
3. **After Your Visit**
   - Complete the survey emailed to you.

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**Contact Info**

**Study Coordinators**
- Vera Wimmers
  - Phone: 801-587-9295
- Alyson Allen
  - Phone: 801-587-4101

**Email:** RemotePrenatalCare@uomail.com

**Principal Investigator**
- Dr. Erin Clark

*Your doctor's telemedicine room: https://util healthcare/*
Preliminary Results of Randomized Trials of Telemedicine Prenatal Care

- In-clinic visits were significantly reduced in both trials
- Mayo Clinic model introduced continuity into a system which had none
- University of Utah model retained continuity

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<tr>
<td>Mean # in-clinic visits</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Total # visits</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>Improved satisfaction (77 to 95%)</td>
<td>Satisfaction not inferior (98% to 100%)</td>
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- No difference in perceived quality of care
- No difference in unplanned visits
- No change in maternal or fetal outcomes (underpowered for this outcome)
Virtual Prenatal Care Patients

What are the 3 most important reasons you liked receiving remote prenatal care?

- Time Savings
- Convenience
- Cost Savings
- Feel More Empowered / Involved
- More Focused Time w/ Provider
- Other

%
Virtual Prenatal Care Patients

Preference for In-Person versus Remote Visits

- <20 wk
- 20-36 wk
- after 36 weeks

%
The New Modern

- Remote prenatal monitoring with digital health tools
  - New companies are marketing platforms that assist healthcare organizations in delivering remote prenatal care
    - Goal to reduce the number of visits while keeping patient satisfaction high
    - Create capacity for new patients in order to justify the investment
The New Modern

• Remote prenatal monitoring with digital health tools
  • Mobile app with cloud
    • Your branding
    • Gestational age specific educational content
    • Scheduling visits and appointment reminders
    • Blood pressure and weight tracking
    • Population Health Dashboard to facilitate care management
    • Purchase functionality in modules
      • Basic care navigation, hypertension, diabetes, postpartum
The New Modern

- Remote prenatal monitoring with digital health tools

Lessons Learned

• Women like these models of prenatal care
• They are willing to use new technology and they learn it easily
• MOST women already have the requisite technology
• Home Dopplers are not the problem that people feared
• Physician acceptance and adoption was the biggest hurdle
  • Baby steps to adoption were important
  • Once adopted, provider and staff satisfaction is high
\[ V = \frac{Q + S}{\$} \]

- \( V \) (Value)
- \( Q \) (Quality)
- \( S \) (Service)
- \( \$ \) (Cost)
Why would you want to tackle this?

• It’s a market differentiator
  • Innovative, novel
  • Patient-centered care
  • Choice
Choice is important in patient satisfaction

“Menu” of safe options for prenatal care

**Personalized Prenatal Care**

- Traditional prenatal care
- Remote prenatal care
- Centering group care
Why would you want to tackle this?

• It’s a market differentiator
  • Innovative, novel
  • Patient centered care
  • Choice

• Potential to increase capacity

• Population management
Opportunities

• Cost-effectiveness analyses & financial model?

• Novel strategies for a higher risk obstetric population

• Population strategies for those without the technology

• Reduce disparities in care for rural and remote patients
  • U.S. population: 19% rural*

*2010 U.S. Census
So you really want to do this...

• University of Utah Health Virtual Prenatal Care went live 2/2018

• Requires:
  • Institutional / hospital / clinic support
  • Talented and committed IT team if you are trying to change the EMR
  • Plan and program to distribute devices
  • Patient-facing materials; team-training materials
  • Enthusiastic and available team to train all staff to do their roles: MAs, nurses, physicians and trainees
ONE SIZE DOES NOT FIT ALL
Prenatal care as we know it is going to change...

Obstetric dogma will be replaced with a focus on evidence-based care, cost-effectiveness and patient satisfaction.