System Complexity and the Challenge of Too Much Medicine

Neel Shah, MD, MPP

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United States Cesarean Delivery Rate (%)

Healthy People 2000: 15% CD Rate

Electronic fetal monitoring saturates market

Trial of labor after cesarean promoted
Healthy People 2000: 15% CD Rate

- Electronic fetal monitoring saturates market
- Trial of labor after cesarean promoted
The facility is a risk factor
Your Biggest C-Section Risk May Be Your Hospital

By Tara Haelle
Last updated: April 13, 2016

The most common surgery performed in U.S. hospitals isn’t on the heart or back or hips or knees. It’s a C-section. Roughly one of every three babies born in this country, or about 1.3 million children each year, are now delivered by cesarean section.

While a number of factors can increase the chance of having a C-section—being older or heavier or having diabetes, for example—the biggest risk “may simply be which hospital a mother walks into to deliver her baby,” says Neel Shah, M.D., an assistant professor of obstetrics, gynecology, and reproductive biology at Harvard Medical School, who has studied C-section rates in this country and around the world.

A new Consumer Reports investigation of more than 1,200 hospitals across the country supports that. It found that C-section rates for low-risk deliveries among U.S. hospitals vary dramatically, even in the same
Why is the facility a woman delivers at her biggest risk factor for major surgery?

How can we help hospitals improve?

How can we help patients choose better hospitals?
Know when you're most fertile.

Ovia™ Fertility gets to know your cycle so you can, too. Track your data,
73.2% emphasize their choice of OB/midwife over hospital
66.5% expect their OB/midwife will deliver their baby
55.1% do not believe their choice of hospital will impact their chance of CD.
74.9% understand that quality of care varies across hospitals—few value existing metrics.
What makes Hospital A different from Hospital B?

Management
The facility is a risk factor
“Darling, here’s the bill from the hospital. One more installment and the baby’s ours.”
## Statement of Account

**Associated Hospital Service of Philadelphia**

112 South 16th Street • Philadelphia 2, Pa. • Locust 4865

**Patient:** Mrs. Reba M. R.  
**Address:** 5800 Westminster Ave.  
**City:** Philadelphia 31, Pa.  
**Hospital:** Temple University

**Subscriber:** Mr. Morris R.  
**Group No.:** 9088-10  
**Certificate No.:** 160226

**Date:** January 16, 1946

### Hospital Care from 1/11/46 to 1/22/46

<table>
<thead>
<tr>
<th>Description</th>
<th>Standard Charge</th>
<th>C.M.A. P. Allow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Room &amp; Delivery Room</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Surgical Dressing</td>
<td>3.50</td>
<td>3.50</td>
</tr>
<tr>
<td>Drugs</td>
<td>3.50</td>
<td>3.50</td>
</tr>
<tr>
<td>Laboratory</td>
<td>10.00</td>
<td>8.00</td>
</tr>
<tr>
<td>X-Ray</td>
<td>10.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Electrocardiogram</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Nursery</td>
<td>5.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Circumcision</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Nurses Board</td>
<td>4.50</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>108.00</strong></td>
<td><strong>91.00</strong></td>
</tr>
</tbody>
</table>

**Allowance by Associated Hospital Service:**

**Balance (Paid by Subscriber to Hospital Named Above):** 17.80

**Hospital Services Rendered to Me from 1/11/46 to 1/22/46 Are Hereby Acknowledged As Full Benefits Under The Terms of Your Hospital Service Plan.**

**Charges of $ 91.00 Made By The Hospital Named Herein Are Acknowledged By Me As A Personal Obligation For Services Not Included Under The Terms of The Plan.**

**Signature of Subscriber:**

**We Appreciate Your Cooperation in Building This Non-Profit Community Plan**
Pressure Builds for a Delivery Decision
Three system factors that influence the decision between Vaginal vs. Cesarean Delivery

CAPACITY
- Delivery Volume/LDR Bed Ratio
- Nurse Staffing Model
- Shift Length

WORKLOAD
- Clinical Protocols
- Productivity Incentives
- Backup Coverage Policies

MOTIVATION
- Hiring Practices
- Talent Development and Retention
- Employee Satisfaction
- Performance and Consequence Management

Vaginal Delivery
20 hrs. Of Clinical Attention

Cesarean Delivery
2 hrs. Of Clinical Attention
Patient Level Model

**INPUTS**

**Patient Covariates:**
- Age at admission
- Age squared
- Race (16.4% missing)
- Interaction of age & race
- Payer (3.3% missing)
- MS-DRG

**Hospital Covariates:**
- Teaching Status
- Total Deliveries (2013-2014)
- NICU Level

**Hospital Management:**
- Capacity
- Workload
- Motivation

**OUTPUTS**

C-section Rates / Length of Stay / Adverse Outcomes
Structure | Process | Outcome

(design) | (management)
THE ROOM
Configuration & Size
Materials & Fixtures
Lighting

PATIENT

PROVIDER

THE UNIT
Bottlenecks
Shared Workspaces
Distance between Rooms
What improved knowledge, skills, and/or tools to managers need to run better labor and delivery units?

- Nurse workload measurement
- Dynamic bed management
- Case scheduling strategies
Next Steps: Management Intervention

DESIGN
- Prototype
- Stakeholder Consultation
- Rapid-cycle intervention testing and feedback
- Expert Consultation

TEST

SPREAD