Perioperative Surgical Home in Obstetrics

Attila Kett, MD, MBA
Introducing

EROS

Enhanced Recovery in Obstetric Surgery
The proportion of women discharged on Day 1

- 1.6% in the first quarter of 2012
- 25.2% in the first quarter of 2014
The Center for Consumer Information & Insurance Oversight

Newborns' and Mothers' Health Protection Act (NMHPA)

The Newborns' and Mothers' Health Protection Act of 1996 (NMHPA) is a federal law that affects the length of time a mother and newborn child are covered for a hospital stay in connection with childbirth. In general, group health plans and health insurance issuers that are subject to NMHPA may NOT restrict benefits for a hospital stay in connection with childbirth to less than 48 hours following a vaginal delivery or 96 hours following a delivery by cesarean section.

If you deliver your baby in the hospital, the 48-hour (or 96-hour) period starts at the time of delivery. If you deliver your baby outside the hospital and you are later admitted to the hospital in connection with childbirth (as determined by the attending provider), the period begins at the time of the hospital admission.

If the attending provider, in consultation with the mother, determines that either the mother or the newborn child can be discharged before the 48-hour (or 96-hour) period, the group health plan or health insurance issuer does not have to continue covering the stay for the one ready for discharge. An attending provider is an individual, licensed under State law, who is directly responsible for providing maternity or pediatric care to the mother or the newborn child. In addition to physicians, an individual such as a nurse midwife, physician assistant, or nurse practitioner may be an attending provider. A health plan, hospital, insurance company, or HMO would NOT be an attending provider.
Cesarean Birth (C-section)

What should I expect after the procedure?

If you are awake for the surgery, you can probably hold your baby right away. You will be taken to a recovery room or directly to your room. Your blood pressure, pulse rate, breathing rate, amount of bleeding, and abdomen will be checked regularly. If you are planning on breastfeeding, be sure to let your health care provider know. Having a cesarean delivery does not mean you will not be able to breastfeed your baby. You should be able to begin breastfeeding right away.

You may need to stay in bed for a while. The first few times you get out of bed, a nurse or other adult should help you.

Soon after surgery, the catheter is removed from the bladder. The abdominal incision will be sore for the first few days. Your doctor can prescribe pain medication for you to take after the anesthesia wears off. A heating pad may be helpful. There are many different ways to control pain. Talk to your health care provider about your options.

A hospital stay after a cesarean birth usually is 2–4 days. The length of your stay depends on the reason for the cesarean birth and on how long it takes for your body to recover. When you go home, you may need to take special care of yourself and limit your activities.
Staff education & empowerment

Standardized care with an emphasis on clinical outcomes

Improved patient information & autonomy
PERIOPERATIVE SURGICAL HOME IN OBSTETRICS
1. Sense of urgency
2. Build guiding coalition
3. Form strategic vision & initiatives
4. Enlist volunteer army
5. Enable action by removing barriers
6. Generate short term wins
7. Sustain acceleration
8. Institute change
Informal networks of change agents operate under the hierarchical radar to make something new happen faster.

The processes in this network look less like management and more like mobilized leadership.
Timeline

- **2 weeks**
  - Map all care processes involved
  - Assemble multidisciplinary team

- **2 weeks**
  - Schedule meetings for the next 6 months
  - Plan audit process

- **0-2 months**
  - Review best practices
  - Write draft protocol

- **3 months**
  - Present draft to multidisciplinary team
  - Stakeholders sign off on the final draft

- **5 months**
  - Create patient education app with SeamlessMD
  - Educate front line staff

- **6 months**
  - Set launch date
  - Launch pilot

- **9 months**
  - Gather all stakeholders for presentation

- **12 months**
  - Estimate completion of the pilot
Scope

Year 1 Pilot
100 Elective Repeat Cesarean Sections

Year 2
All Elective Low Risk Cesarean Sections

Year 3
All Non-Emergency Low Risk Cesarean Sections
Clinical Protocol

Office
- Patient & Family information
- Optimizing Hb
- SeamlessMD smartphone app download & sign in

Pre-op
- Anesthetic review
- Information via SeamlessMD smartphone app
- Discharge Planning
- Carbohydrate loading
- Aspiration prophylaxis

Admission
- Optimizing hydration with warmed fluids
- PONV prophylaxis
- Timing (7.30 or 9.30 case)
- Antibiotic prophylaxis

Intraop
- Optimal use of OR-s
- Standardised anesthetic protocol
- Normothermia maintenance
- Skin to skin and breastfeeding in OR
- Delayed cord clamping
- Nausea prophylaxis
- VTE prophylaxis

Post-op
- Daily medical review and daily HealthCheck with SeamlessMD app
- Non-narcotic pain control
- Early mobilization measured with FitBit
- Early Foley removal
- Early normal diet
- Discharge planning

Discharge
- Daily HealthCheck with Seamless MD app
- Data collection
- Readmission and adverse event review
- Next day phone follow up
- Home visit by nurse if necessary
What is the enhanced recovery after surgery program?

This new program focuses on helping improve each mom's experience after a cesarean section (c-section). The program helps moms heal faster and feel better sooner after surgery. Now moms can focus on caring for themselves.

How do I join this program?

Talk to your obstetrician about this program at your next appointment. Ask them if this program is a good option for you and your baby. Together, you can create a care plan that is right for you.

They can also get to know their new baby sooner!

Know your Enhanced Recovery after Cesarean Section Program

For women preparing for surgery

Read this booklet to know:
• What this program is
• How it can help you
• How you can join
What is the enhanced recovery after cesarean section app?

This state-of-the-art smartphone app is a real-time step-by-step guide to your surgery journey. The interactive program puts you in the heart of your healthcare. The clear and simple design puts you in control of your own healthcare needs. All the advice on the program was designed by your Saint Peter’s Healthcare System cesarean section team.

The program is tailored for you and your family!

How do I sign up for this app?

Your obstetrician will talk to you about this app of your 36-week appointment. They will give you the sign-up form for the app.

To sign up, you need to:
1. Fill in the sign-up form for the app.
2. Give the form to your obstetrician’s office team.
3. Check your email for a message from “SeamlessMD”.
4. Follow the steps in the email to set up your account.
5. Download the “SeamlessMD” app from your app store.

How to Get Started on your Enhanced Recovery after Cesarean Section App

For women and their families

Read this booklet to know:
- What this app is
- How it can help you
- How you can sign up
Welcome to the Enhanced Recovery after cesarean section program!

This new program focuses on helping improve each mother’s experience after a cesarean section (c-section). The program helps mothers heal faster and feel better sooner after surgery.

New mothers can focus on caring for themselves and getting to know their baby. Please review the following topics:

- How to prepare for surgery
- What to expect during your hospital stay
- How to take care of yourself after surgery
- How to manage common problems after birth
- Where to get more help

What will my scars look like after c-section surgery?

Most c-section scars are in the lower abdomen (belly) area, below the bikini line.
Improving patient compliance with PSH protocol using patient engagement and care management technology

Engage patients with PSH protocol

Track patient compliance & progress

Improve patient outcomes
Sign up for parent education classes today!

Hi Karen!

Are you interested in learning more about caring for your new baby? Saint Peter's Hospital has many classes available for sign up. Learn about birth, breastfeeding and more. There are classes designed for new dads, grandparents and siblings too.

Click the 'Learn more' to see the list of classes.

Learn more
OK, I've read this

Learn about the Enhanced Recovery C-section Program

Hi Karen!

Did you know that you are enrolled in the special Enhanced Recovery for C-section program? This new research-based program is designed to help mothers heal faster and feel better sooner after surgery. You can now focus on getting to know your baby sooner!

Learn more
OK, I've read this

Know what to expect during your hospital stay

Hi Karen!

Do you want to know what to expect during your hospital stay? Most women stay in the hospital for 2 days after birth. Click 'Learn more' to read about each day.

Learn more
OK, I've read this
Effect of time of day of surgery on next day discharge:

Percentage who went home after one nights stay.

Time of day for elective caesarean section.

Need for dedicated elective lists?
Carbohydrate loading

Perioperative oral intake data

Average time (hours) to oral intake post elective caesarean sections at Jessop Wing – 2003 to 2011.

<table>
<thead>
<tr>
<th></th>
<th>Clear Fluids</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op’</td>
<td>2 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>Post-op’</td>
<td>Immediate</td>
<td>One hour</td>
</tr>
</tbody>
</table>

![Graph showing the average time (hours) to oral intake post elective caesarean sections at Jessop Wing – 2003 to 2011.](chart.png)
Perioperative temperature management
Delayed cord clamping:

- Increases the amount of blood going to the newborn from the placenta
- Increases blood haemoglobin levels
- Should improve neonatal recovery
- Obstetricians have instituted a new protocol for this

No evidence that it reduces length of stay for term babies.
Early skin to skin
PREVENTION OF NAUSEA & VOMITING

**REOP**
1.5 MG TRANSDERMAL SCOPLAMINE
IF PATIENT HAS HISTORY OF POSTOPERATIVE NAUSEA & VOMITING OR MOTION SICKNESS

**INTRAOP**
4 MG INTRAVENOUS ZOFRA
10 MG INTRAVENOUS REGLAN
10 MG INTRAVENOUS DEXAMETHASONE

**POSTOP**
IF SYSTOLIC BLOOD PRESSURE LESS THAN 90 mmHG
GIVE IV. EPHEDRINE 10 MG
IF SYSTOLIC BLOOD PRESSURE MORE THAN 90 mmHG
GIVE 4 MG INTRAVENOUS ZOFRA
Arrival in Recovery

Exclusion criteria
- Surgical complications
- Bleeding
- General anesthetic

Encourage the patient to eat and drink

Diet not tolerated
Nausea or vomiting

If hemodynamically unstable
Call the anesthesiologist

Diet tolerated

If hemodynamically stable
Treat with antiemetic
If symptoms persist
Call the anesthesiologist

Diet tolerated

- Discontinue intravenous fluid and heplock the catheter
- Check chart to ensure pain relief prescribed correctly
- Refer to post anesthetic guidelines for observation in recovery and discharge criteria
- Send to the floor if no complications

Refer to post anesthetic guidelines for observation in recovery and discharge criteria
MANAGEMENT OF PAIN IN THE OR & IN THE PACU

- Intravenous Ketorolac
  30mg given in the OR

- Intravenous Dilaudid
  0.5 mg or 5-10 mg Oxycodone per mouth given in the PACU if necessary

- Intrathecal morphine
  0.15 mg given in the OR
### Pain Management on POD#1

<table>
<thead>
<tr>
<th>Time</th>
<th>Medication</th>
<th>Dosage</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 HOURS POSTOP</td>
<td>1000 MG IV. OFIRMEV</td>
<td>1000 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>6 HOURS POSTOP</td>
<td>30 MG IV. KETOROLAC</td>
<td>30 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>9 HOURS POSTOP</td>
<td>1000 MG IV. OFIRMEV</td>
<td>1000 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>12 HOURS POSTOP</td>
<td>30 MG IV. KETOROLAC</td>
<td>30 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>15 HOURS POSTOP</td>
<td>1000 MG IV. OFIRMEV</td>
<td>1000 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>18 HOURS POSTOP</td>
<td>30 MG IV. KETOROLAC</td>
<td>30 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>21 HOURS POSTOP</td>
<td>1000 MG IV. OFIRMEV</td>
<td>1000 MG</td>
<td>IV.</td>
</tr>
<tr>
<td>24 HOURS POSTOP</td>
<td>30 MG IV. KETOROLAC</td>
<td>30 MG</td>
<td>IV.</td>
</tr>
</tbody>
</table>

For pain score 7-10 out of 10:
- **Dilaudid 1 mg iv.** every 6 hours as needed
- If not tolerating oral meds:
  - **Oxycodone 10 mg by mouth** every 4 hours as needed

For pain score 4-6 out of 10:
- **Oxycodone 5 mg by mouth** every 4 hours as needed
PAIN MANAGEMENT on POD#2

For pain score 7-10 out of 10:
Dilaudid 1 mg iv. every 6 hours as needed
if not tolerating oral meds

For pain score 7-10 out of 10:
Oxycodone 10 mg by mouth every 4 hours as needed

For pain score 4-6 out of 10:
Oxycodone 5 mg by mouth every 4 hours as needed
Pfannenstiel Incision
Did you feel any pain while resting or not moving yesterday?

- 0: 8 (21%)
- 1: 24 (62%)
- 2: 4 (10%)
- 3: 3 (8%)
- 4: 0 (0%)
- 5: 0 (0%)

Did you feel any pain while walking and moving around yesterday?

- 0: 5 (13%)
- 1: 18 (46%)
- 2: 12 (31%)
- 3: 3 (8%)
- 4: 1 (3%)
- 5: 0 (0%)
GUIDELINES FOR BLADDER MANAGEMENT AFTER CESAREAN SECTION

Remove Catheter 6 hours after insertion

Measure volume of first void and record in postnatal care plan within 6 hours of catheter removal

- More than 200 ml
  - No further action
- Less than 200 ml
  - Measure post void residual using bladder scanner
    - Less than 200 ml
      - Review fluid balance chart
        - Encourage fluids
        - Void again within 2 hours
    - More than 200 ml
      - Indwelling catheter for 24 to 48 hours

- Less than 200 ml
  - Measure voided volume and residuals
    - Residuals more than 200 ml
      - Indwelling catheter, inform obstetrician
POSTOPERATIVE MOBILIZATION

- Service evaluation of spinal anaesthesia (n=50)
- Takes 7.5 (3-12) hours to wear off (median (range))
- For caesarean section finishing at 10am:

<table>
<thead>
<tr>
<th>13:00 Lower limit</th>
<th>14:00</th>
<th>15:00</th>
<th>16:00</th>
<th>17:00</th>
<th>18:00 Median</th>
<th>19:00</th>
<th>20:00</th>
<th>21:00</th>
<th>22:00 Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Great! 1 out of 12 milestones completed

Today's Milestones

- **Stay out of bed**
  Stay out of bed as much as you can, as tolerated. Aim for at least 6 hours out of bed.
  - OK, got it!

- **Walk in the hallway**
  Walk in the hallway at least three times today with the help of a nurse or your family. If your nurse says it's ok to walk by yourself, do accordingly.
  - OK, got it!

- **Sit in a chair for all meals**
  - Completed ✓

- **Drink liquids**
  Drink liquids (i.e. water, juice), as tolerated. Aim for at least 800 ml of liquids today.
  - OK, got it!
Engage patients in recovery with daily feedback

After completing the daily self-assessment, patients receive automated feedback letting them know if they are on track or behind schedule with their ERAS milestones. By keeping patients aware of both your expectations and their actual progress, you can motivate them to stay on track for discharge.
Empower self-management
Patients track progress & receive feedback for self-care.

Monitor patient progress
Care teams can track warning signs & recovery milestones.

Notify providers of at-risk patients
Alert care teams for early signs of complications.
Complications & Readmissions
<table>
<thead>
<tr>
<th>Date</th>
<th>Nov 26</th>
<th>Oct 31</th>
<th>Oct 24</th>
<th>Oct 23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (EDT)</td>
<td>7:27 am EDT</td>
<td>6:16 pm EDT</td>
<td>6:03 pm EDT</td>
<td>2:19 pm EDT</td>
</tr>
<tr>
<td>Status</td>
<td>8/8</td>
<td>8/8</td>
<td>8/8</td>
<td>2/9/7</td>
</tr>
<tr>
<td>Mood</td>
<td>2/8 - Somewhat happy</td>
<td>0/8 - Neutral</td>
<td>0/8 - A little down</td>
<td>4/8 - Very happy</td>
</tr>
<tr>
<td>Pain in lower belly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pain medicines</td>
<td>No</td>
<td>Yes, forget to bring it</td>
<td>Yes, forget</td>
<td>Yes</td>
</tr>
<tr>
<td>Fluid leaking</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Wound splitting open</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Red bump on wound</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Temp. &gt; 100.4°F (38°C)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Self-tracking**

- **Date**: Nov 26
  - My wound is leaking however there is brown color "like dirt" when I wipe and why shows on days I actually and walking. My left inner leg is burning. It is extremely bad when I am sleeping or sitting. The pain keeps me up at night.
  - My left side is extremely numb on certain days. I notice a dirt like sweat substante. I cannot seem to stay away sitting up.
  - My under belly and top vagina is numb, aside of my stomach is hanging lower than the other. I am also having itching on my incision, not sure if the numbness is normal.
  - True
Patient satisfaction
Survey Selection: Patient Experience at Discharge Survey (1 day post-discharge) (V1 - Aug 05, 2016)

Surveys Sent:
60
Total surveys sent in period

Survey Responses Received:
38
Total survey responses received in period

Response Rate:
63%
Response rate for time period
On the day of surgery, how well did the care team do with getting you ready to go into the operating room?

- Excellent: 34 (83%)
- Very good: 5 (12%)
- Good: 2 (5%)
- Fair: 0 (0%)
- Poor: 0 (0%)

# of Responses
How well did the care team do with keeping your caregiver(s) and/or family member(s) updated on how you were doing during your surgery?

- Excellent: 30 (73%)
- Very good: 8 (20%)
- Good: 2 (5%)
- Fair: 1 (2%)
- Poor: 0 (0%)
How did you get your pain medicines after surgery yesterday?

- Intravenous (IV): 20 (38%)
- Pill: 31 (58%)
- Epidural: 1 (2%)
- Not sure: 1 (2%)

Did your nurse detach your IV needle from the bag of medicine yesterday?

- Yes: 38 (90%)
- No: 2 (5%)

Did your nurse take off your urinary catheter yesterday?

- Yes: 31 (78%)
- No: 9 (22%)
<table>
<thead>
<tr>
<th></th>
<th>May 28</th>
<th>May 20</th>
<th>May 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (EDT)</td>
<td>11:21 am EDT</td>
<td>1:47 pm EDT</td>
<td>9:11 am EDT</td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood</td>
<td>0/6 - Neutral</td>
<td>0/6 - Neutral</td>
<td>2/6 - Somewhat happy</td>
</tr>
<tr>
<td>Pain in lower belly</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Pain medicines</td>
<td>No, not feeling pain</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td># narcotic pills</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eating healthy</td>
<td>No, ate enough but not healthy</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dark yellow/brown urine</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Urine &lt;4 times/day</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Dry lips and mouth</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Dizziness/light-headed</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Headache</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Fainted or passed out</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Trouble urinating</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Hard poo</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Not pooped for 3+ days</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Chest pain</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Calf pain</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Sudden trouble breathing</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Redness or warmth that is increasing</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Swelling/edema</td>
<td>OK</td>
<td>OK</td>
<td>OK</td>
</tr>
</tbody>
</table>
Length of stay
<table>
<thead>
<tr>
<th></th>
<th>Dec 2016</th>
<th>Jan 2017</th>
<th>Feb 2017</th>
<th>Mar 2017</th>
<th>Apr 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients enrolled in SeamlessMD</td>
<td>8</td>
<td>2</td>
<td>12</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Patients activated their accounts within 7 days enrolled</td>
<td>75%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>90.91%</td>
</tr>
<tr>
<td>Number of patients who had surgeries on SeamlessMD</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Average Length of Stay (Discharge day - Surgery Day)</td>
<td><strong>3.5</strong></td>
<td><strong>2.4</strong></td>
<td><strong>2.7</strong></td>
<td><strong>2.7</strong></td>
<td><strong>2.2</strong></td>
</tr>
<tr>
<td>% Patients checked-in within 7 days after surgery</td>
<td>25%</td>
<td>83.33%</td>
<td>57.14%</td>
<td>30%</td>
<td>57.14%</td>
</tr>
<tr>
<td>% Patients completed at least one health check</td>
<td>66.67%</td>
<td>100%</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Reducing Care Variation

Potential Hospital-wide Charge Savings by Reducing Variation

- Vaginal and Cesarean Delivery (540 & 560) $1,168,000
- Dorsal & Lumbar Fusion Procedure (304) $770,100
- Knee Joint Replacement (302) $756,800
- Sepsis (720) $455,600
- Hip Joint Replacement (301) $355,000
- Normal Newborn or Neonate (640) $333,400
- Heart Failure (194) $278,200
- Cervical Spinal Fusion (321) $241,000
- Percutaneous Cardio Procedures w/o AMI (175) $236,900
- Rehabilitation (860) $234,900
- Other Pneumonia (139) $229,100
- COPD (140) $226,500
- Other Vascular Procedures (173) $218,500
- Major Small & Large Bowel Procedures (221) $215,600

Crimson Continuum of Care data and analysis
### Direct variable cost

<table>
<thead>
<tr>
<th>Per Patient</th>
<th>Supplies</th>
<th>Variable Labor</th>
<th>Variable Benefits</th>
<th>Drugs</th>
<th>Total Variable Costs per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>$ 159</td>
<td>$ 576</td>
<td>$ 176</td>
<td>$ 26</td>
<td>$ 937</td>
</tr>
<tr>
<td>Newborn</td>
<td>$ 29</td>
<td>$ 418</td>
<td>$ 125</td>
<td>$ 7</td>
<td>$ 579</td>
</tr>
</tbody>
</table>
### Variable cost savings

<table>
<thead>
<tr>
<th></th>
<th>ERAS cases per year</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>250</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Direct variable cost</td>
<td></td>
<td>.75</td>
<td>1</td>
<td>1.25</td>
<td>.75</td>
</tr>
<tr>
<td>savings per day of LOS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conservative scenario, LOS 0.75 d ($ in thousands)</td>
<td>85 114 142 213 284 355 426 569 711</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example scenario, LOS 1.0 d ($ in thousands)</td>
<td>114 152 190 284 329 474 569 658 948</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimistic scenario, LOS 1.25 d ($ in thousands)</td>
<td>142 190 237 355 474 592 711 948 1,184</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Program cost

<table>
<thead>
<tr>
<th>Costs</th>
<th>Annual no. of ERAS cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Implementation costs, $</td>
<td></td>
</tr>
<tr>
<td>Perioperative Surgical Home Learning Collaborative (year 1)</td>
<td>25,000</td>
</tr>
<tr>
<td>Physician/Nursing leadership time (year 1 only, 0.1 FTE)</td>
<td>0</td>
</tr>
<tr>
<td>Capital expenses, equipment (year 1 only)</td>
<td>500</td>
</tr>
<tr>
<td>Annual costs, $</td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td>Project manager (0.5 FTE)</td>
<td>0</td>
</tr>
<tr>
<td>Preoperative support (0.25 FTE)</td>
<td>0</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Education materials</td>
<td>5,000</td>
</tr>
<tr>
<td>Carbohydrate drinks/nutrition supplements</td>
<td>1,500</td>
</tr>
<tr>
<td>Disposable materials related to fluid warmers, heating blankets or other ERAS equipment and additional medication cost</td>
<td>16,000</td>
</tr>
<tr>
<td>Total first year costs, $</td>
<td>48,000</td>
</tr>
<tr>
<td>Annual maintenance costs, $</td>
<td>22,500</td>
</tr>
<tr>
<td>Cost per patient, year 1, $</td>
<td>480</td>
</tr>
</tbody>
</table>
## Net cost savings 1st year

<table>
<thead>
<tr>
<th>Year 1</th>
<th>ERAS cases per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Net cost savings per day of LOS</td>
<td>.75</td>
</tr>
<tr>
<td>Conservative scenario, LOS 0.75 d ($ in thousands)</td>
<td>37</td>
</tr>
<tr>
<td>Example scenario, LOS 1.0 d ($ in thousands)</td>
<td>66</td>
</tr>
<tr>
<td>Optimistic scenario, LOS 1.25 d ($ in thousands)</td>
<td>94</td>
</tr>
</tbody>
</table>
## Net cost saving non-1st year

<table>
<thead>
<tr>
<th>Non-year 1</th>
<th>ERAS cases per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Net cost savings per day of LOS</td>
<td>.75</td>
</tr>
<tr>
<td>Conservativescenario, LOS 0.75 d ($ in thousands)</td>
<td>62</td>
</tr>
<tr>
<td>Example scenario, LOS 1.0 d ($ in thousands)</td>
<td>91</td>
</tr>
<tr>
<td>Optimistic scenario, LOS 1.25 d ($ in thousands)</td>
<td>119</td>
</tr>
</tbody>
</table>
296 % ROI during the first year. The return will increase to 451% in subsequent years.
Key elements of PSH for elective caesarean section:

• Many patients post elective CS may go home on the second day
• Communication is key
  • With patients
  • With colleagues
• Enthusiastic staff – particularly post-partum floor
• Maintain momentum over a long period
• Neonate/ breastfeeding – delay discharge