

Perioperative Surgical Home in Obstetrics

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Introducing
EROS

Enhanced Recovery in Obstetric Surgery



Introduction of enhanced recovery for elective caesarean section enabling next day discharge: a tertiary centre experience

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ABSTRACT

Background: The widespread adoption of enhanced recovery programmes in various surgical specialties has resulted in patient benefits including reduced morbidity, reduced length of stay and an earlier return to normal activities. This evidence, along with the increased financial pressures in the UK National Health Service, has led many units to consider introducing such a programme for obstetric surgery. We report our experience in setting up an enhanced recovery programme for women undergoing elective caesarean section and a prospective analysis of factors that influence length of stay.

Methods: An enhanced recovery pathway was designed by a multidisciplinary team and introduced in March 2012. Factors influencing length of stay were determined using a log normal model.

Results: The proportion of women discharged on Day 1 increased from 1.6% in the first quarter of 2012 to 25.2% in the first quarter of 2014. The 30-day readmission rate was 4.4% for those discharged on Day 1 and 5.6% for Day 2. Earlier gestation, multiple birth, intention to breast feed, longer surgery and more time in the post-anaesthesia recovery unit were all independently associated with a longer postoperative stay. Women presenting for obstetric surgery with the indication “one previous caesarean section” were more likely to leave hospital earlier compared to most other indications.

Conclusion: An enhanced recovery programme was successfully introduced into our unit. Many of the interventions were straightforward and could be adopted easily elsewhere.

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Keywords: Enhanced recovery; Elective; Caesarean section

Introduction

The concept of an enhanced recovery programme, otherwise known as fast-track surgery, following elective surgery was developed more than 10 years ago.¹ The aim of enhanced recovery is to optimise multiple aspects of patient care, improve recovery, and facilitate earlier discharge without reducing patient satisfaction or the quality of care.^{2–6} Much of the work establishing the benefits of enhanced recovery has been conducted on patients undergoing colorectal surgery, but the same concepts have since been used in gynaecology, urology and orthopaedics.⁷ Widespread adoption is related to mounting evidence that implementation of enhanced recovery programmes results in reduced patient morbidity, reduced length of stay and earlier return to normal activities.^{2,7}

Until recently there has been little interest in enhanced recovery for obstetric surgery. However,

next-day discharge is in keeping with National Institute for Health and Care Excellence (NICE) guidance which states that “women who are recovering well, are asymptomatic and do not have complications following caesarean section (CS) should be offered early discharge (after 24 h) from hospital and follow-up at home, because this is not associated with more infant or maternal readmissions.”⁸ Pressure on National Health Service (NHS) budgets has resulted in increased support for earlier discharge for women following CS.^{9,10} Caesarean section is one of the commonest surgical procedures performed by the NHS, and most patients are discharged at least two days post-surgery.¹¹ Earlier discharge on the day after surgery could result in significant cost savings for obstetric units.

A survey in our unit of 58 women who were discharged on Day 2 or later after elective CS found that 46% would have preferred to go home at least a day earlier. We introduced fast-track surgery for this patient group, and now report our experience and an analysis of factors that may determine length of stay following elective CS.

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- The proportion of women discharged on Day 1
 - 1.6% in the first quarter of 2012
 - 25.2% in the first quarter of 2014

Marquette Law



- Medicare
- Medicaid/CHIP
- Medicare-Medicaid Coordination
- Private Insurance**
- Innovation Center
- Regulations & Guidance
- Research, Statistics, Data & Systems
- Outreach & Education

[CCIO Home](#) > [Other Insurance Protections](#) > [Newborns' and Mothers' Health Protection Act \(NMHPA\)](#)



The Center for Consumer Information & Insurance Oversight

Programs and Initiatives

[Consumer Support and Information](#)

[Health Insurance Market Reforms](#)

[Health Insurance Marketplaces](#)

[Insurance Programs](#)

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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.

The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS



FREQUENTLY ASKED QUESTIONS
LABOR, DELIVERY, AND POSTPARTUM CARE
FAQ006

Cesarean Birth (C-section)

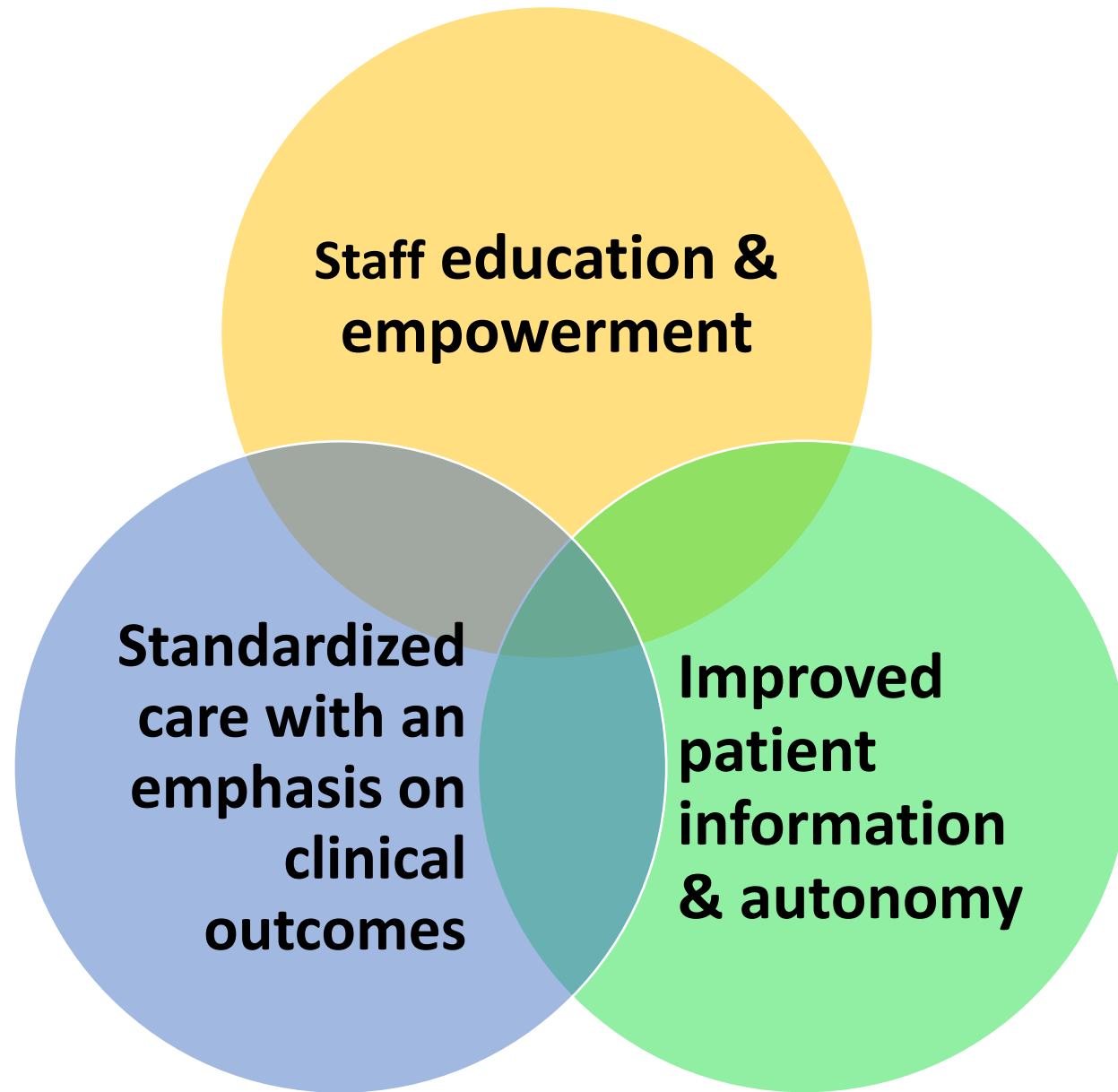
What should I expect after the procedure?

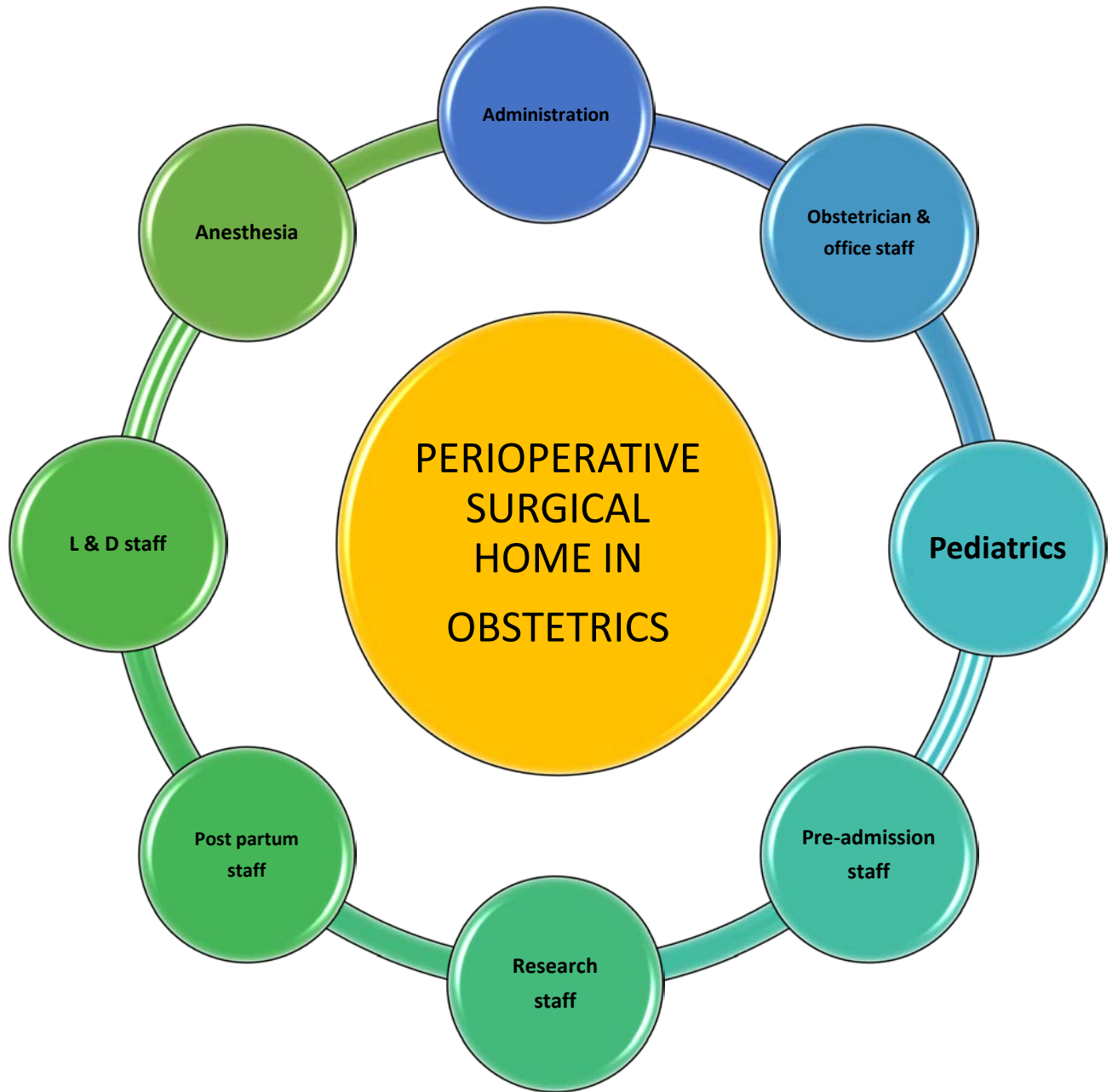
If you are awake for the surgery, you can probably hold your baby right away. You will be taken to a recovery room or directly to your room. Your blood pressure, pulse rate, breathing rate, amount of bleeding, and abdomen will be checked regularly. If you are planning on breastfeeding, be sure to let 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.

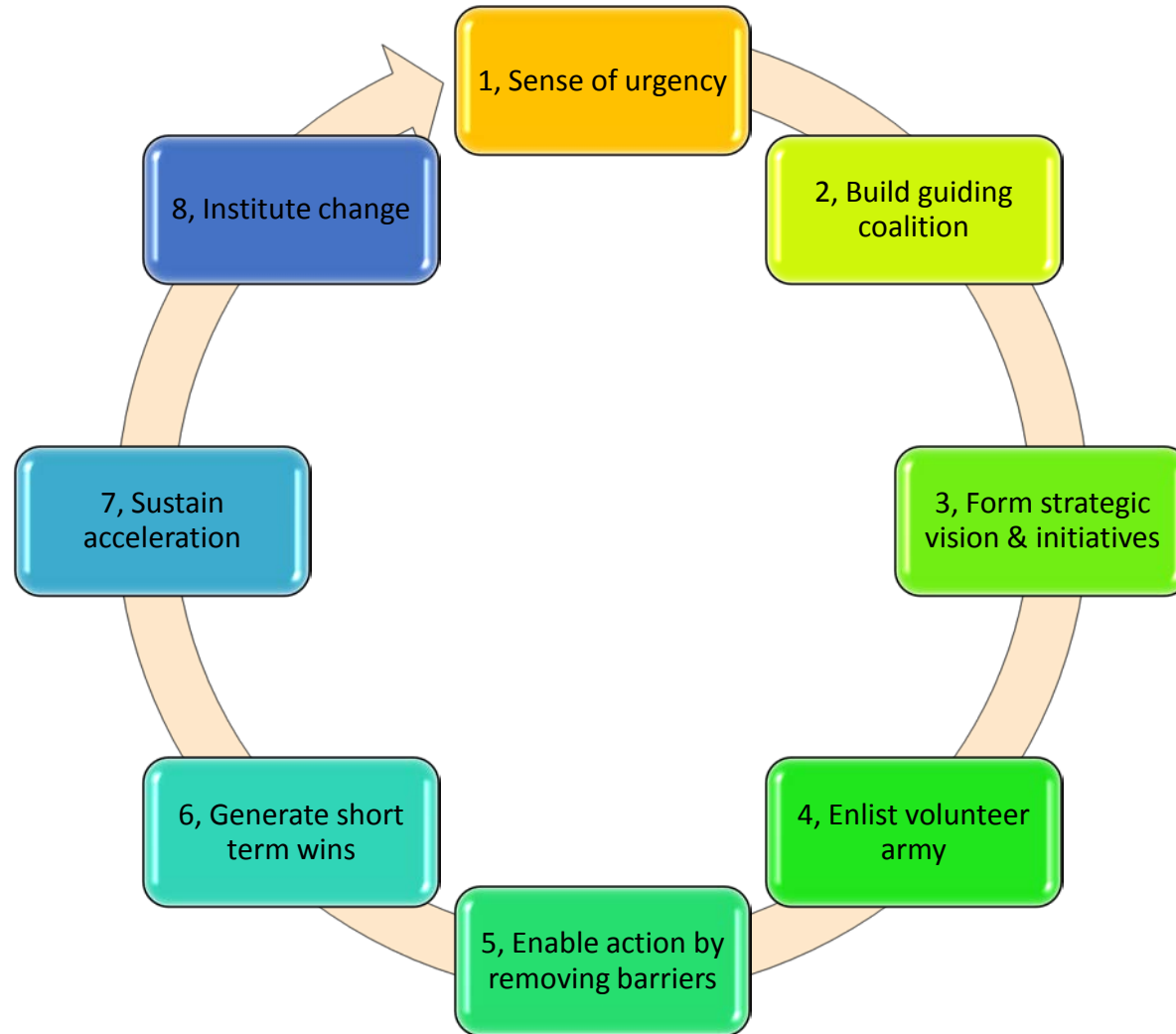
Soon after surgery, the catheter is removed from the bladder. The abdominal incision will be sore for the first few days. Your doctor can prescribe pain medication for you to take after the anesthesia wears off. A heating pad may be helpful. There are many different ways to control pain. Talk to your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





Change management





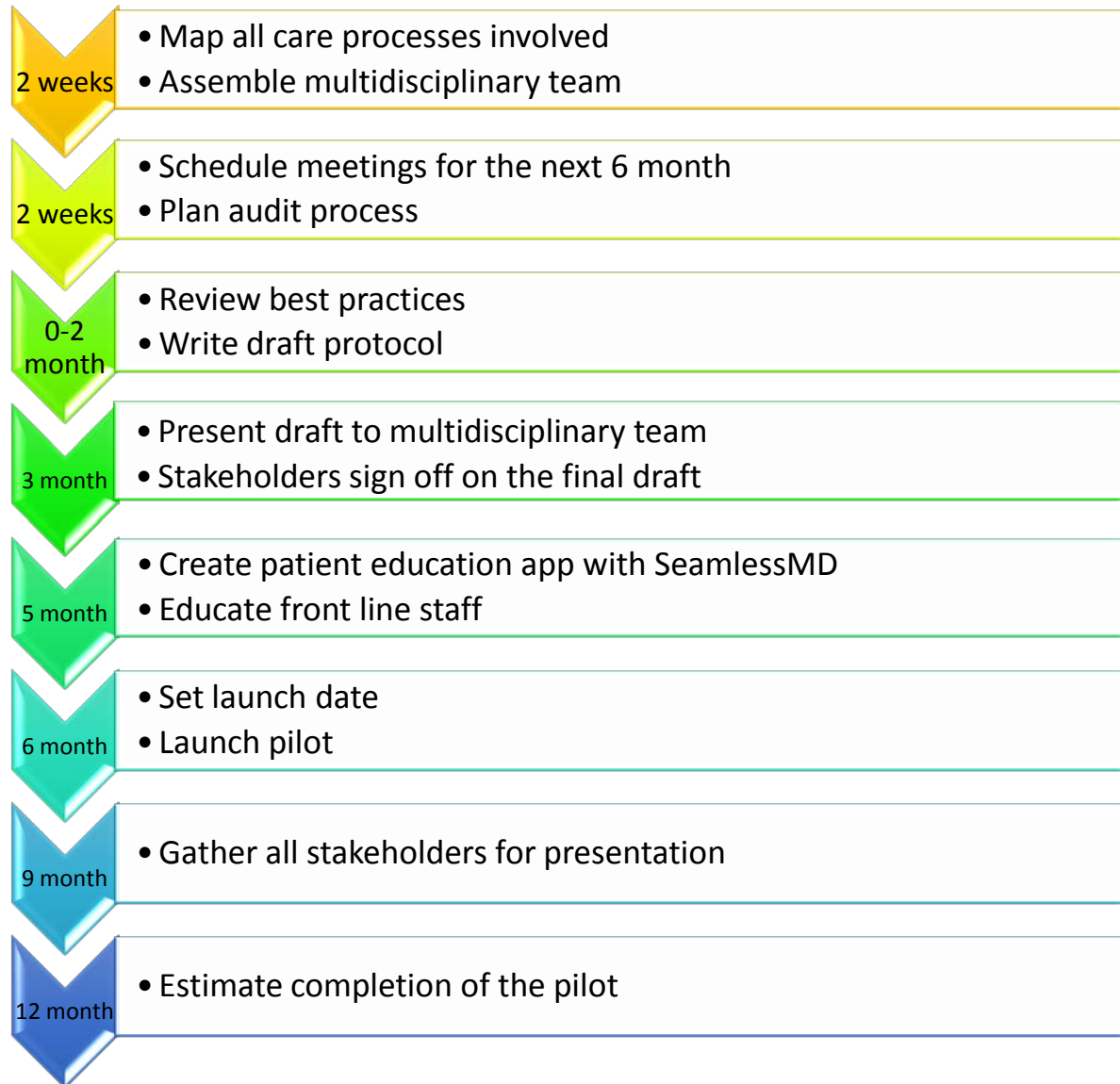
Informal networks of change agents

operate under the hierarchical radar to make something new happen faster.

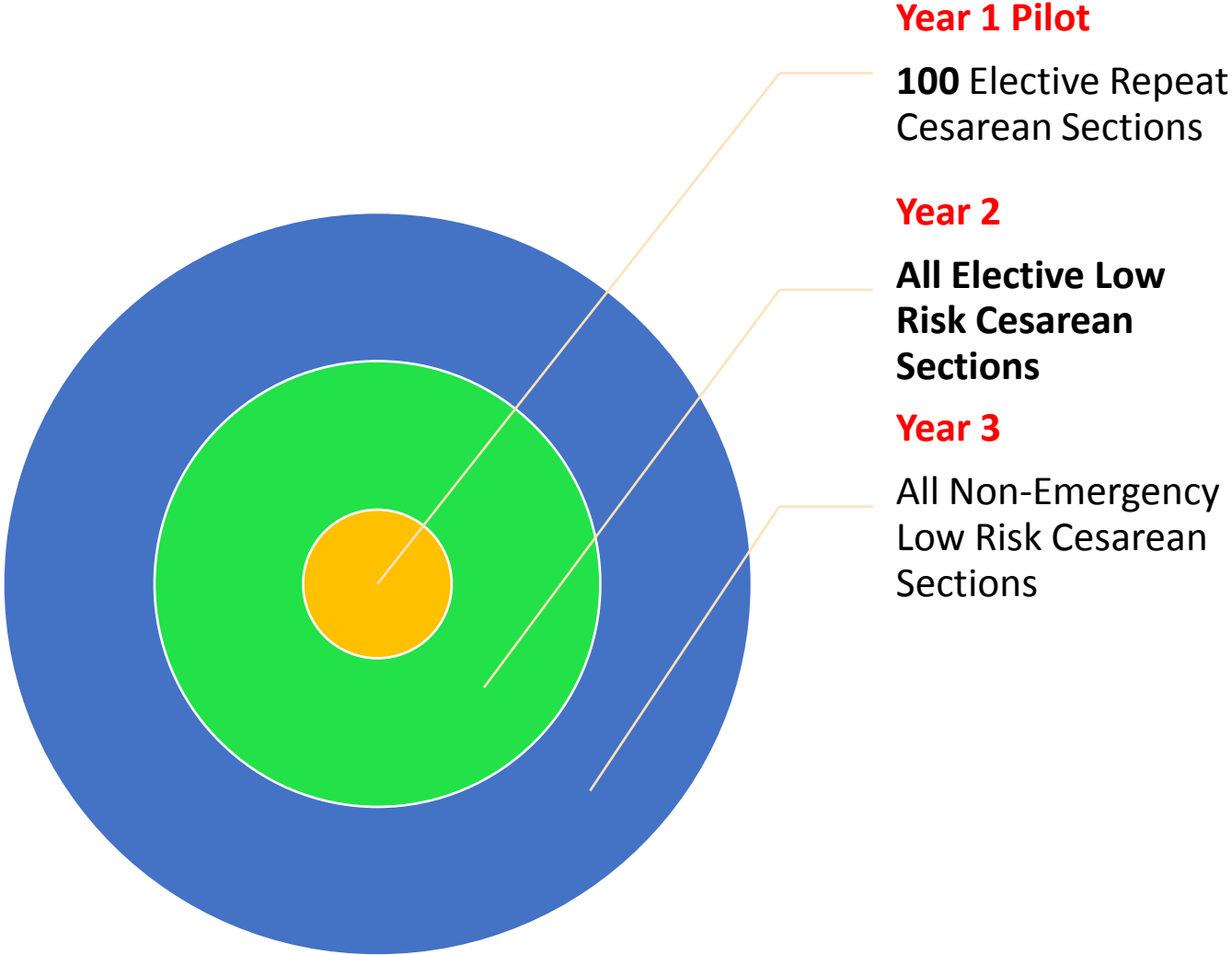
The processes in this network look less like management and more like

mobilized leadership

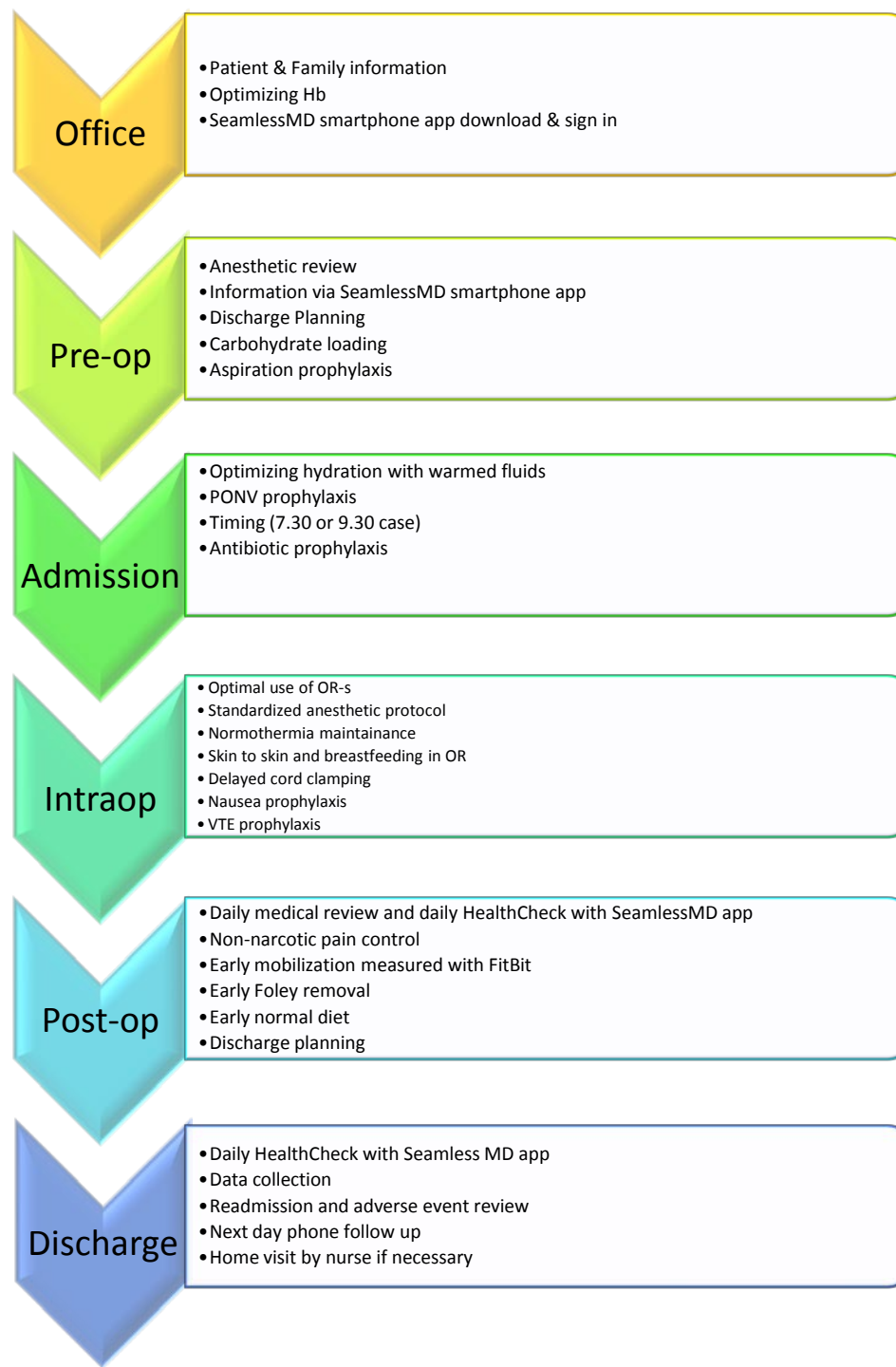
Timeline



Scope



Clinical Protocol



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.

New moms can focus on caring for themselves.

They can also get to know their new baby sooner!



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.



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 at 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.

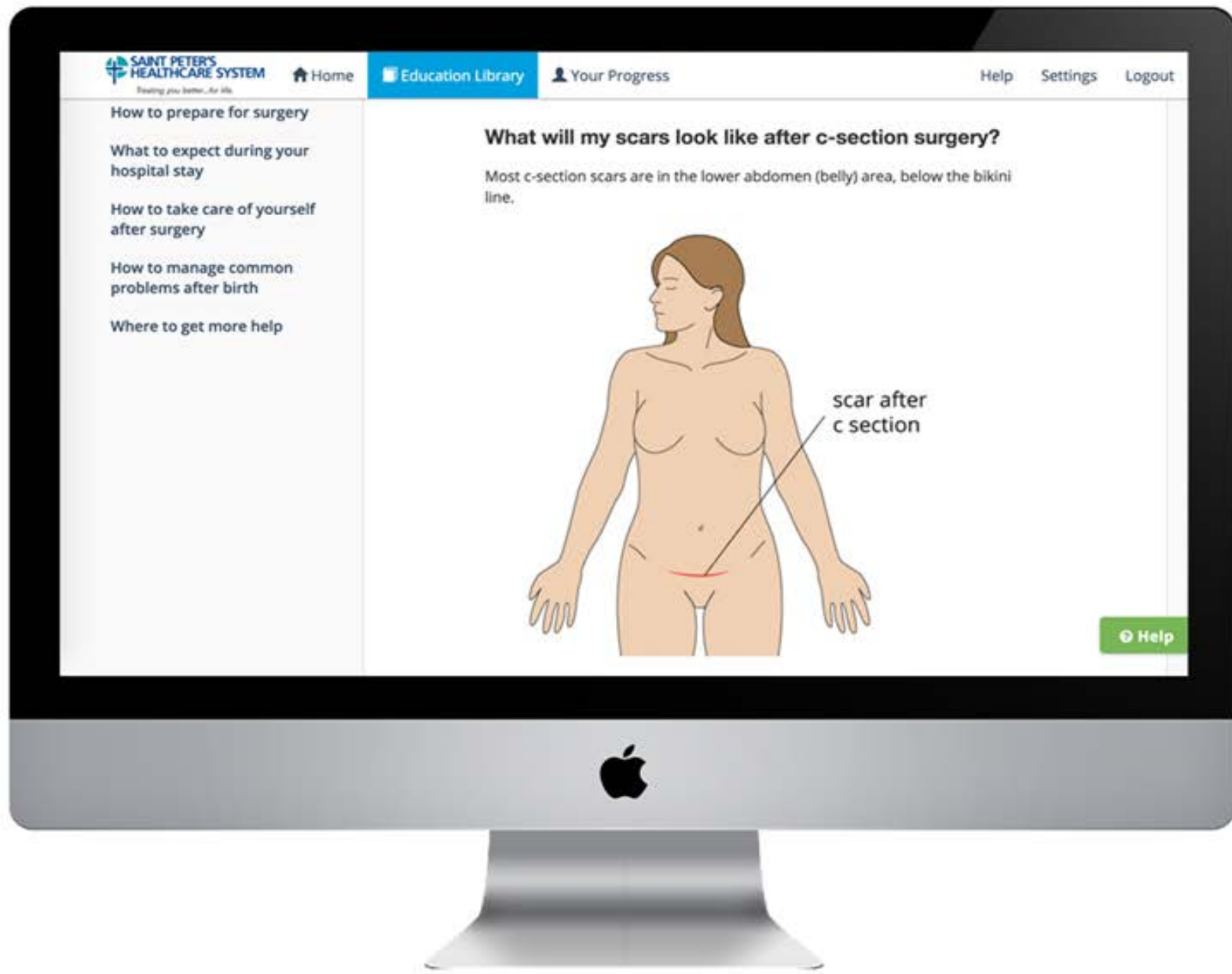


How to Get Started on your Enhanced Recovery after Cesarean Section App

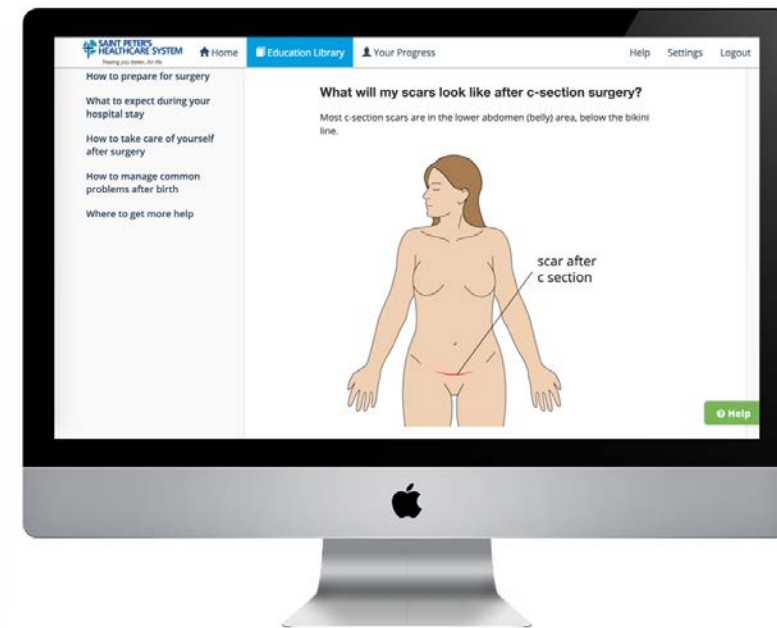
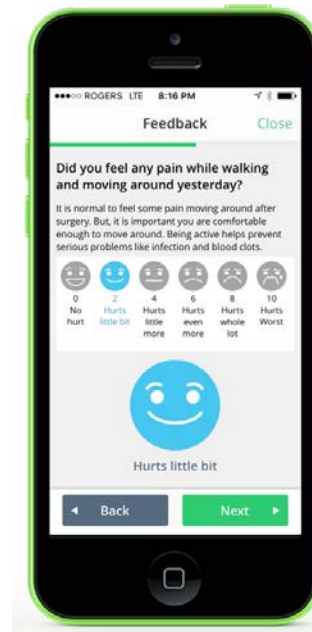
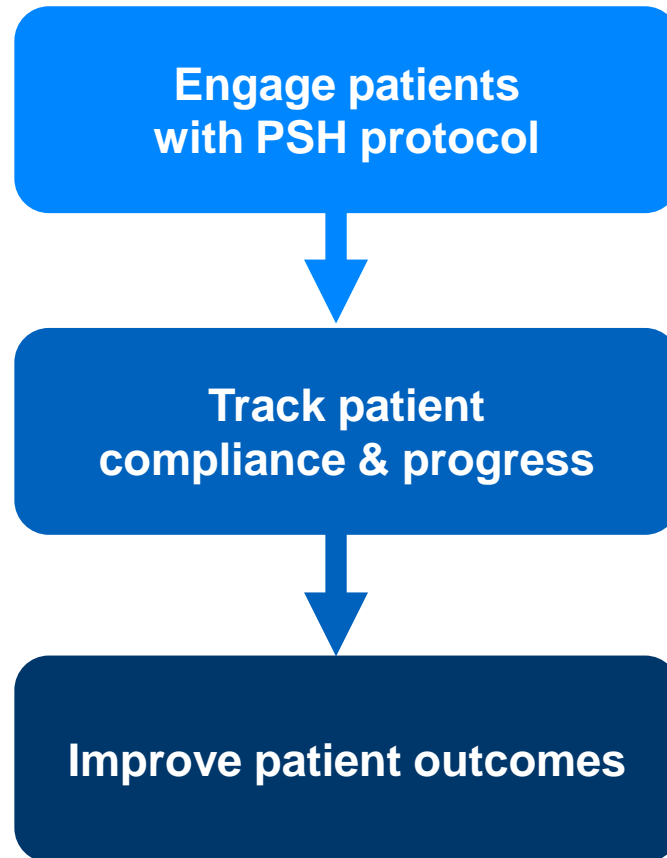
For women and their families

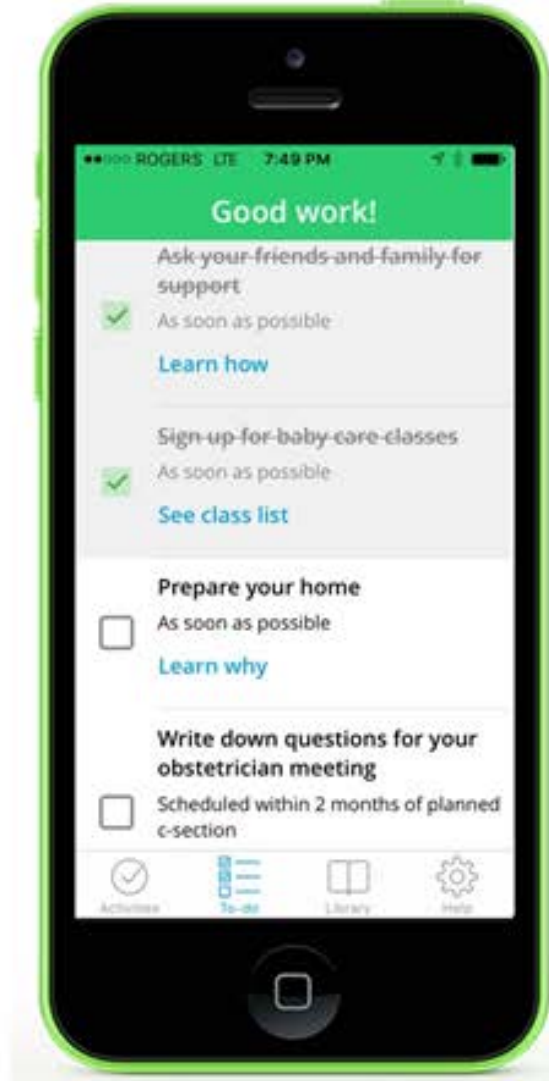
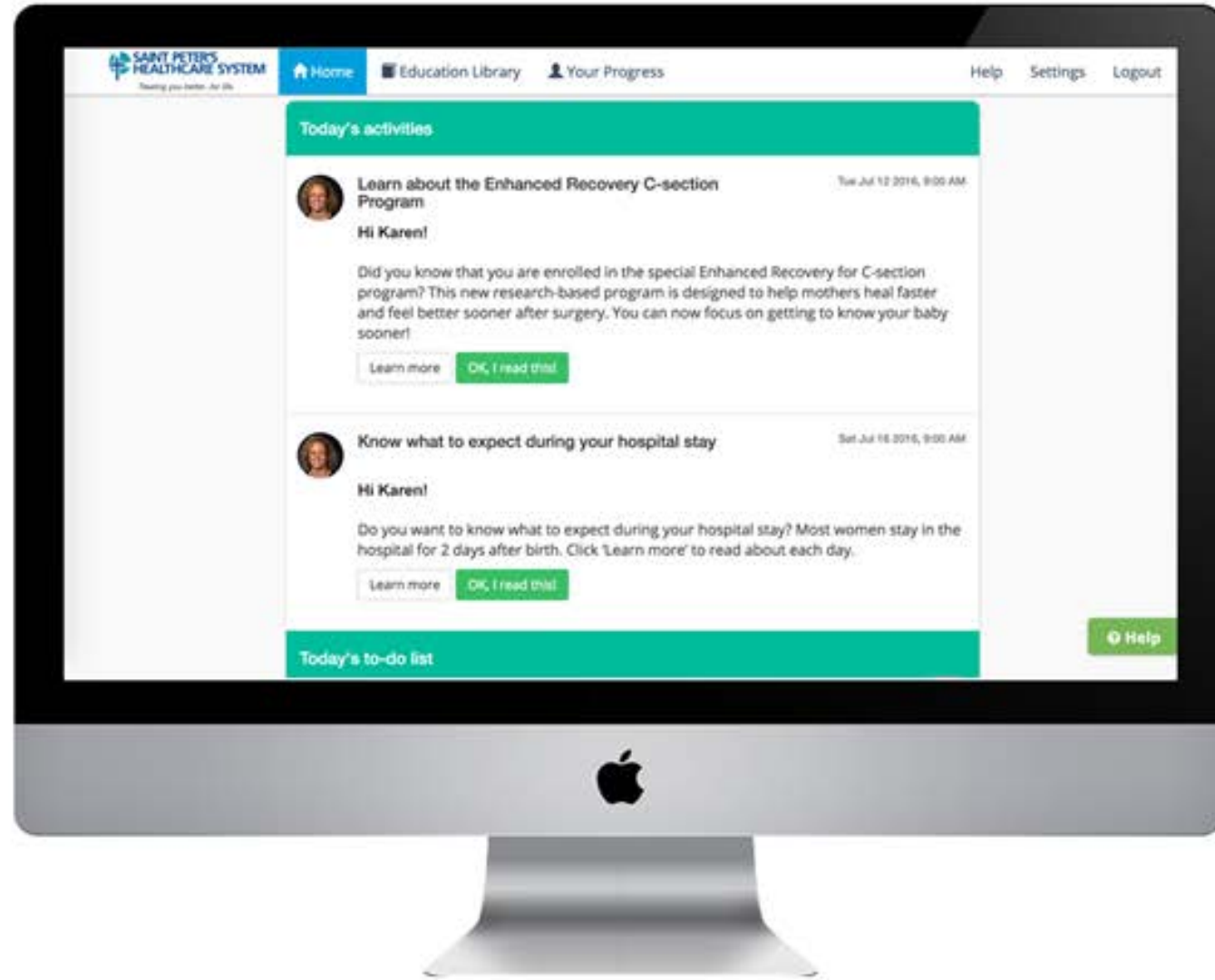
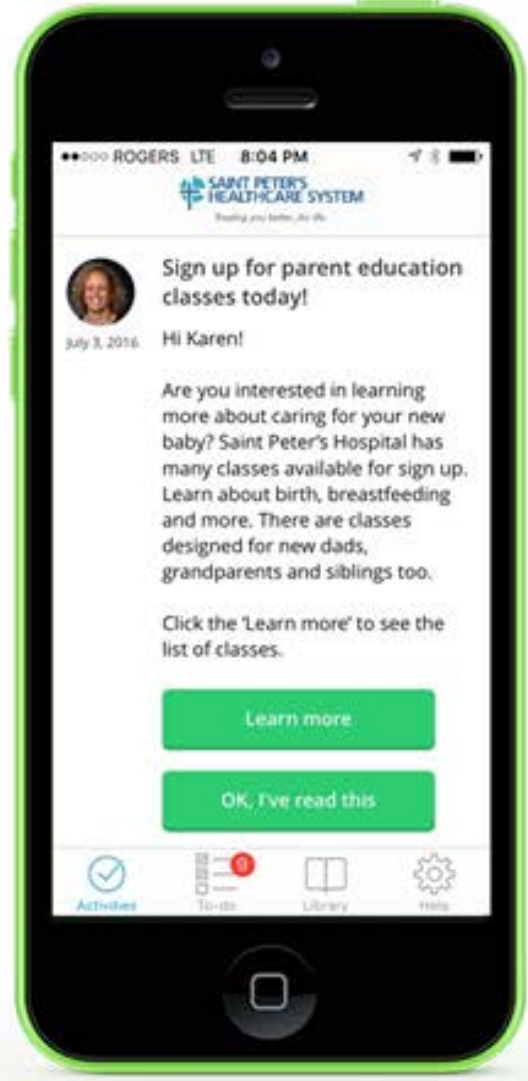
Read this booklet to know:

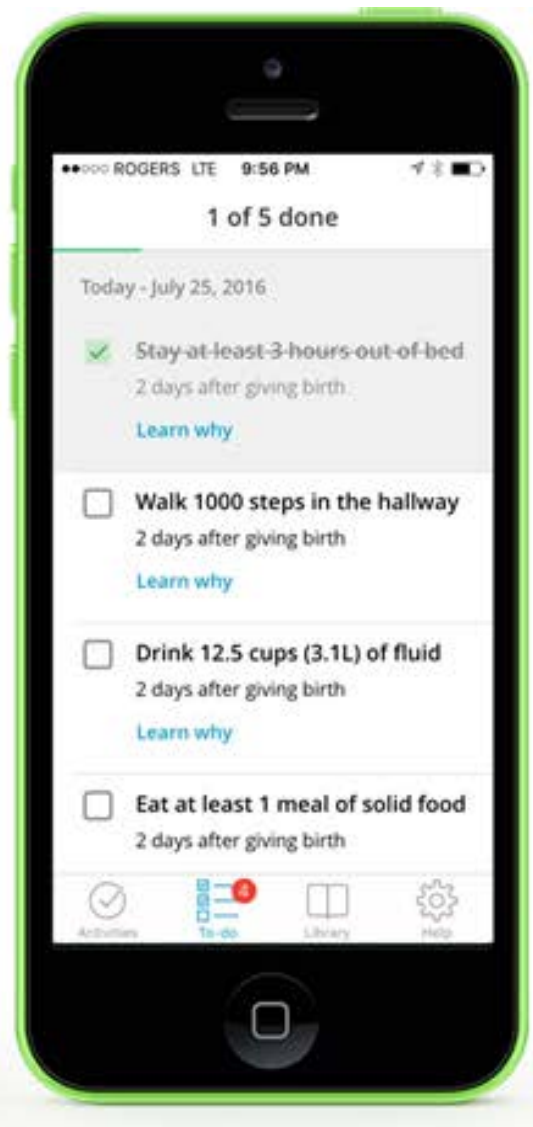
- What this app is
- How it can help you
- How you can sign up



Improving patient compliance with PSH protocol using patient engagement and care management technology

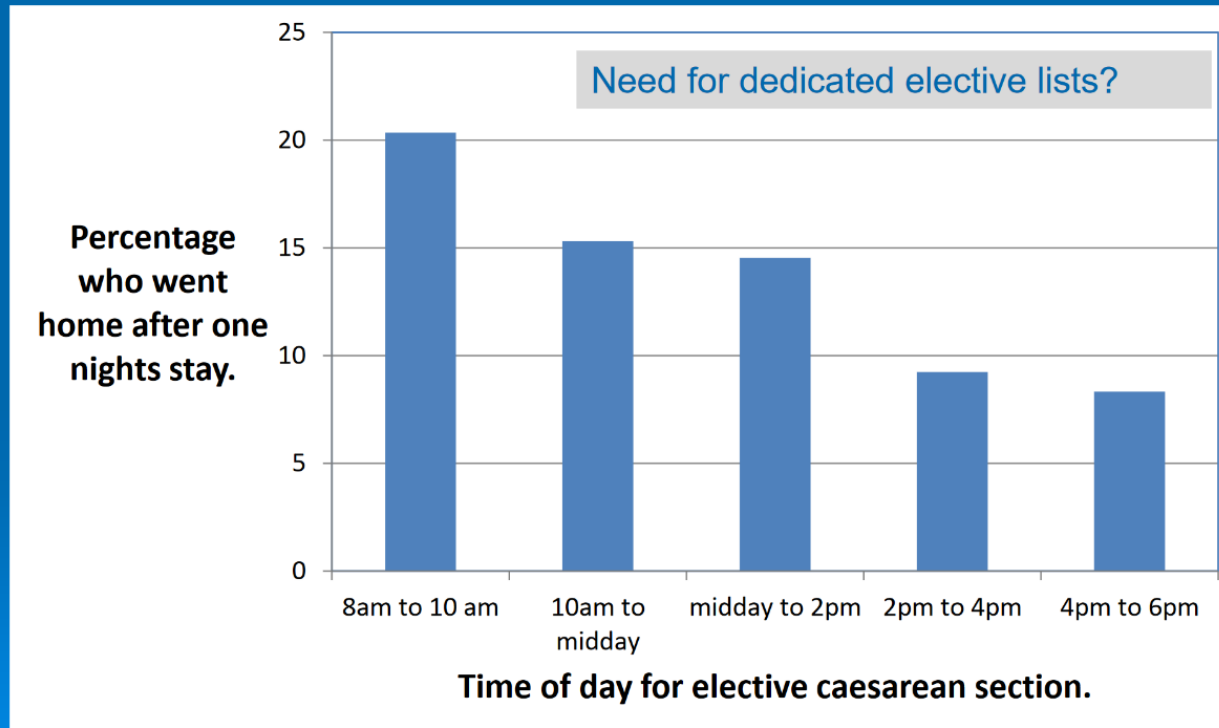






SCHEDULING

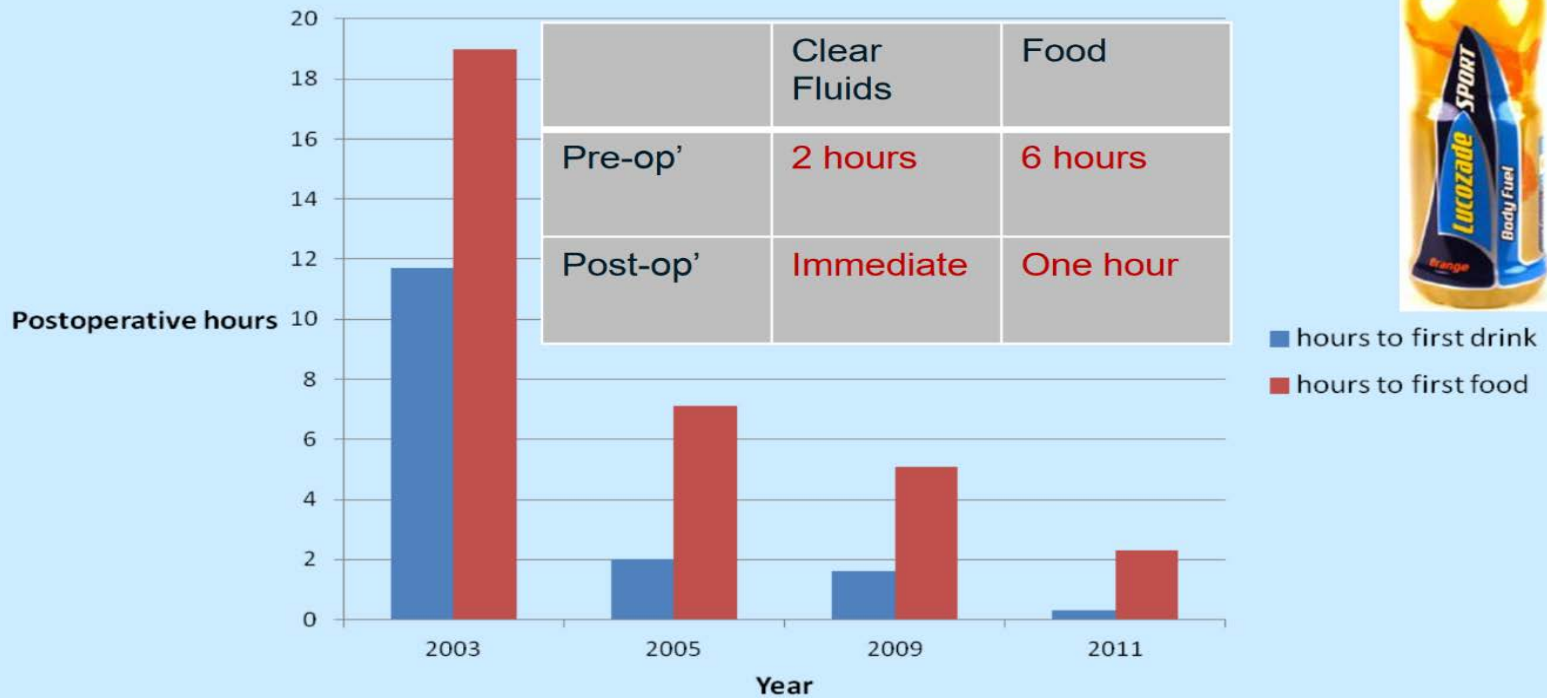
Effect of time of day of surgery on next day discharge:



Carbohydrate loading

Perioperative oral intake data

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

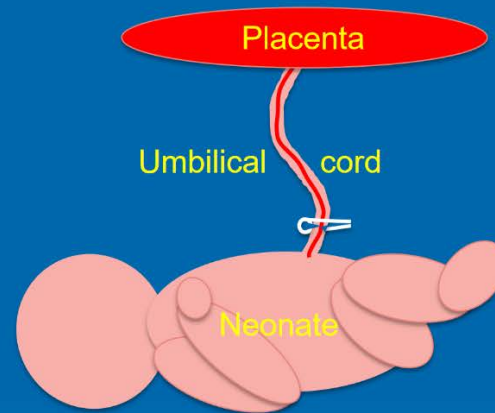


Perioperative temperature management



Delayed cord clamping

Delayed cord clamping:



No evidence that it reduces length of stay for term babies.

- 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

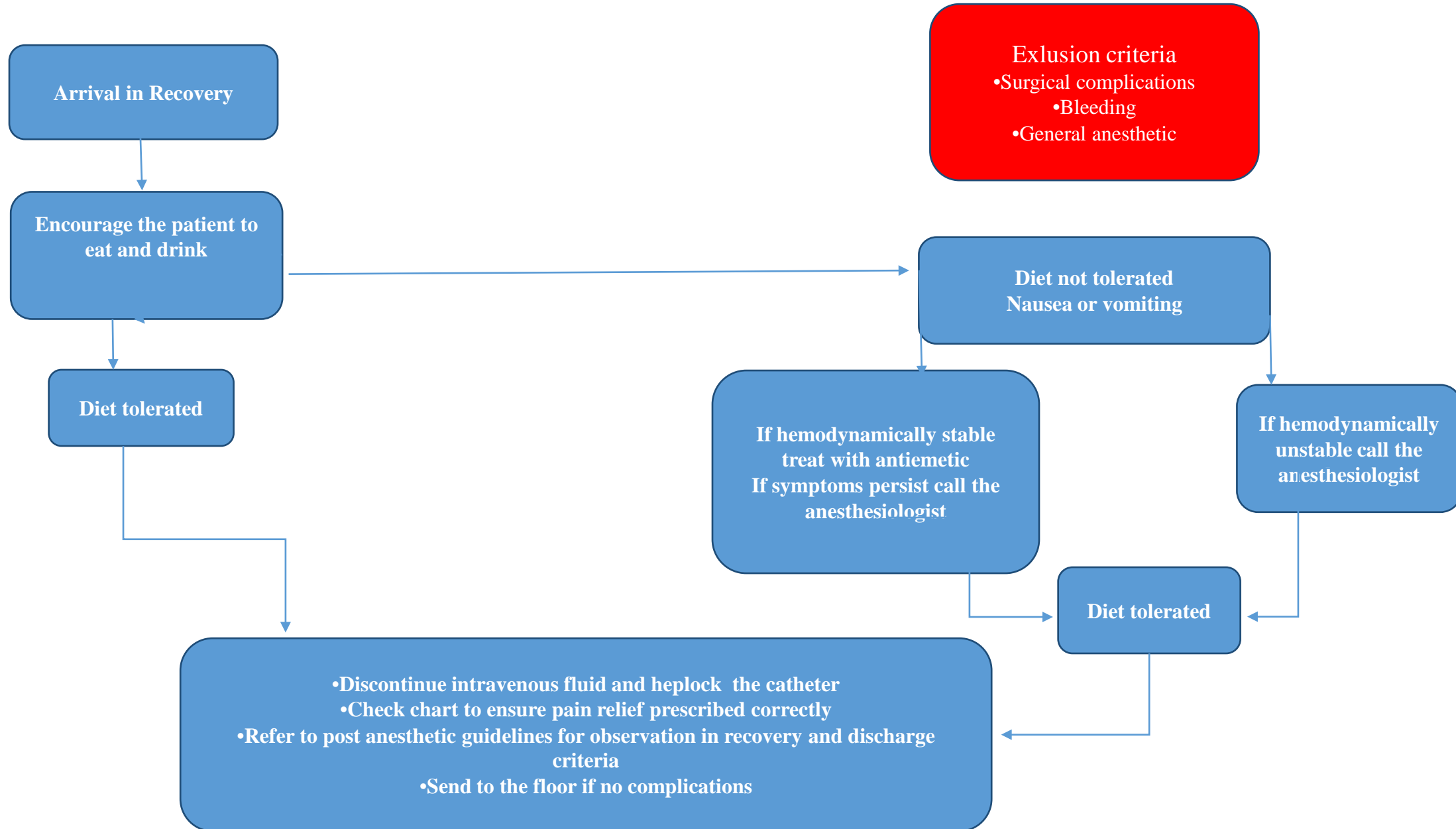
Early skin to skin



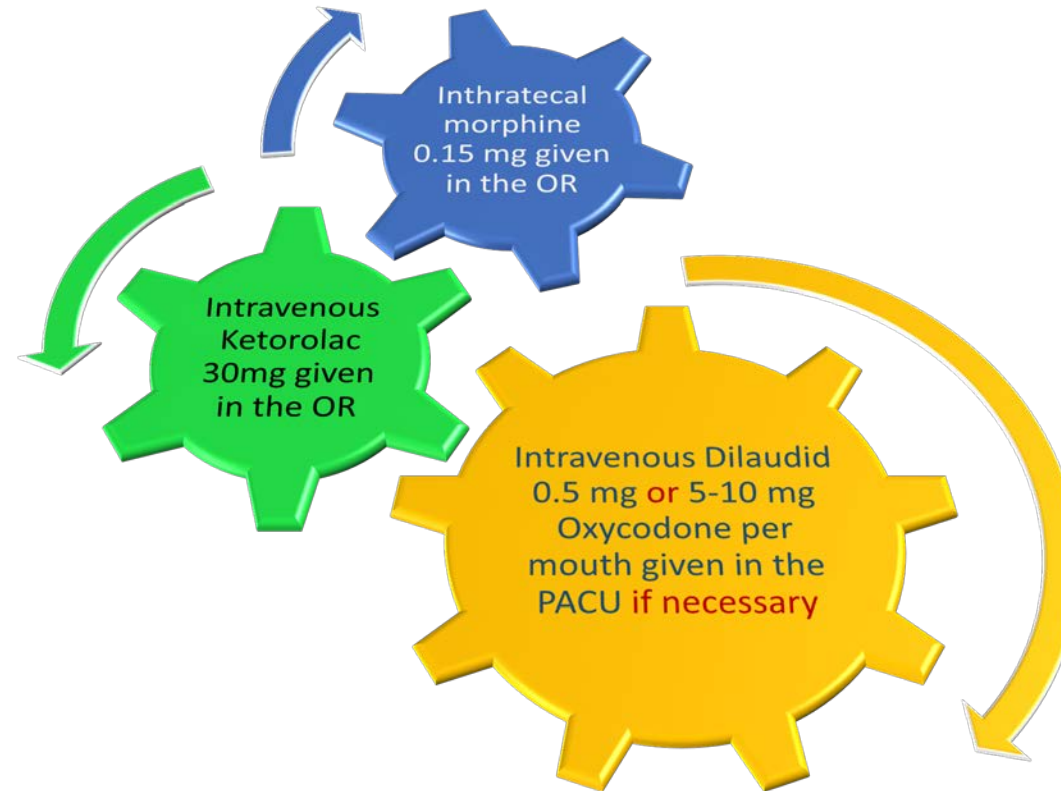
PREVENTION OF NAUSEA & VOMITING



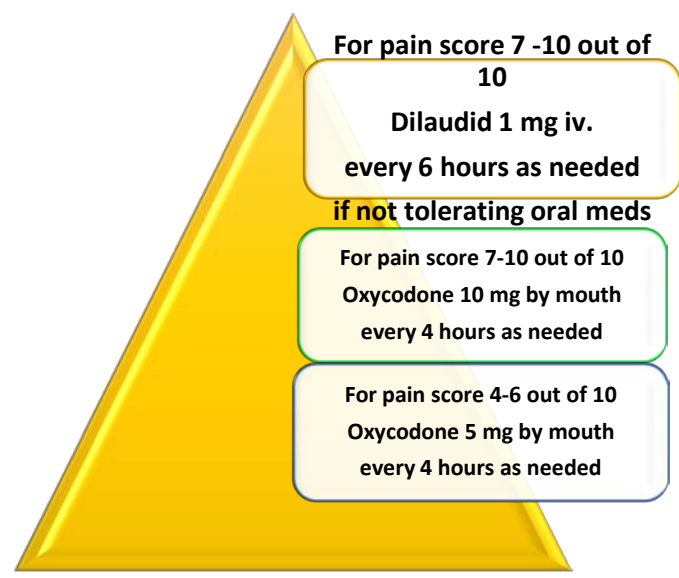
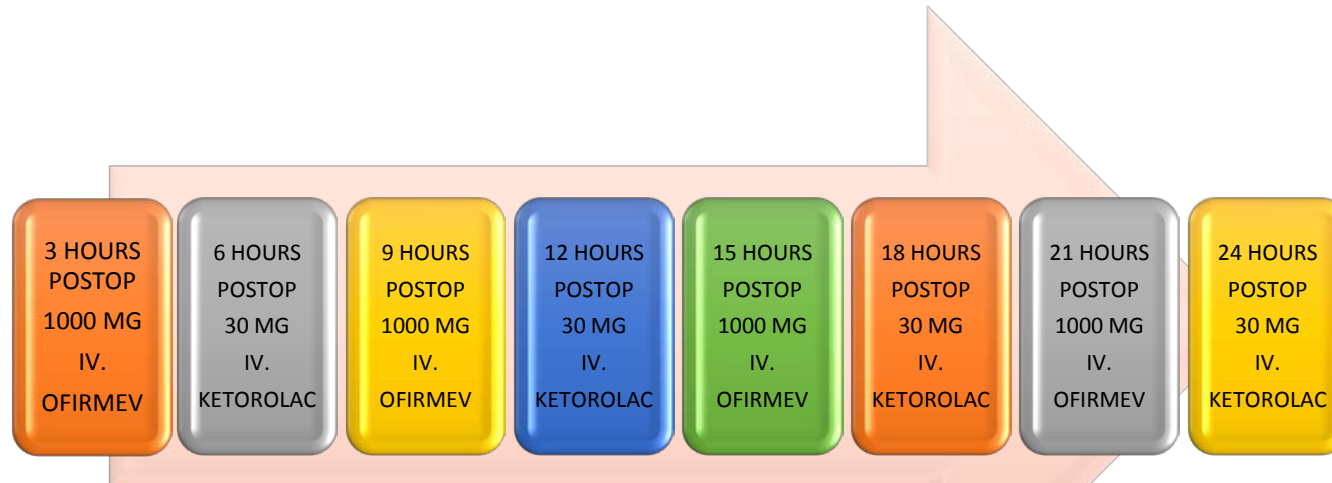
STEP FIVE: POST-OPERATIVE CARE IN THE HOSPITAL



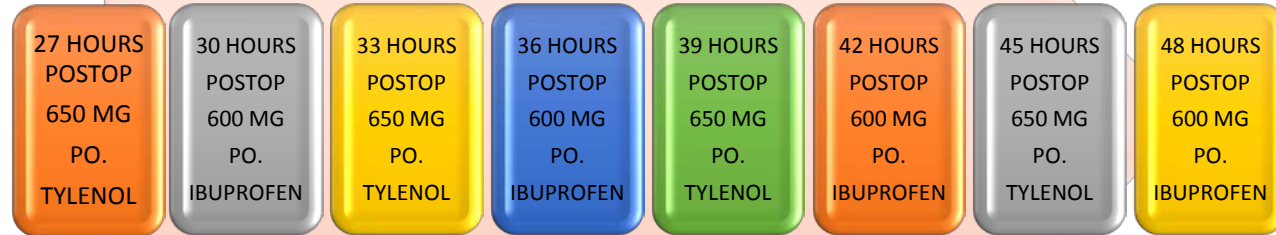
MANAGEMENT OF PAIN IN THE OR & IN THE PACU



PAIN MANAGEMENT on POD#1



PAIN MANAGEMENT on POD#2



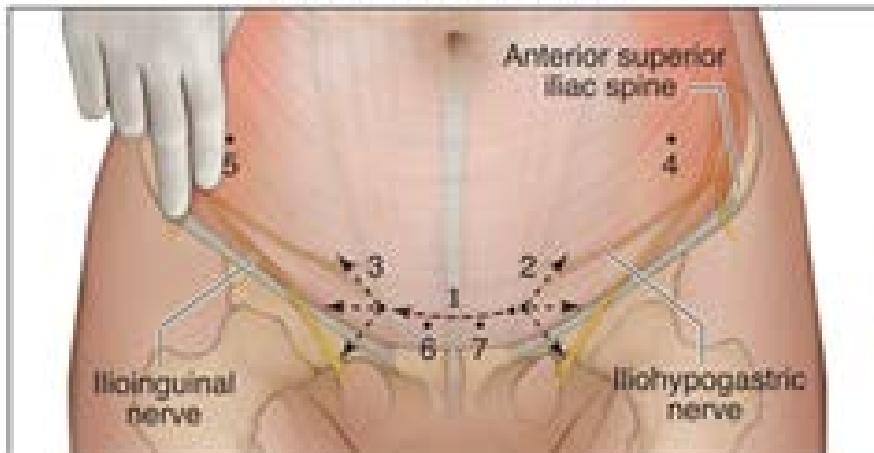
For pain score 7 -10 out of 10
Dilaudid 1 mg iv.
every 6 hours as needed
if not tolerating oral meds

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

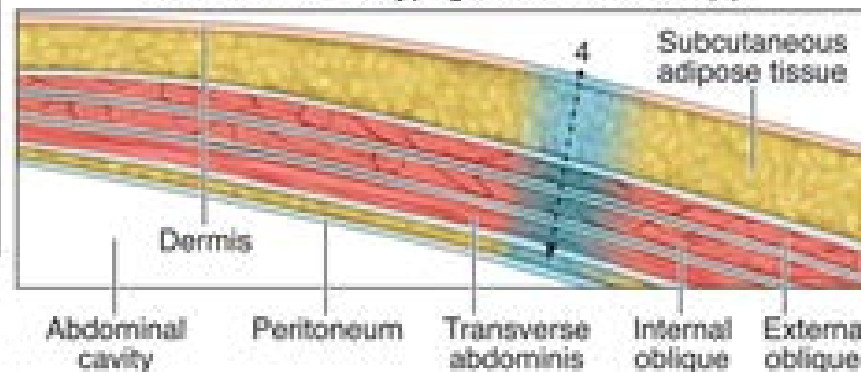
For pain score 4-6 out of 10
Oxycodone 5 mg by mouth
every 4 hours as needed

Pfannenstiel Incision

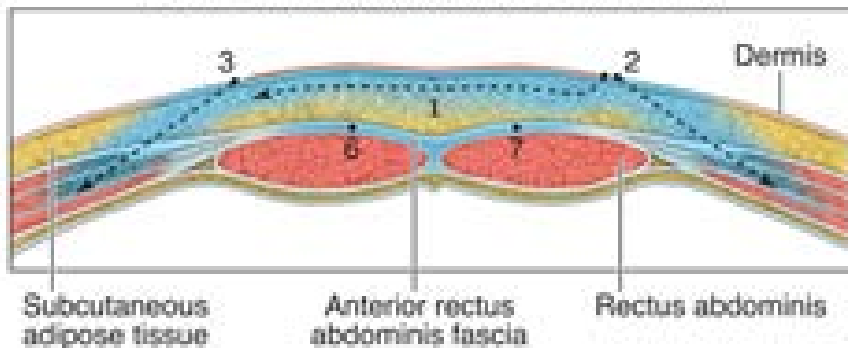
Frontal view of infiltrations



Axial view of iliohypogastric infiltration (4)

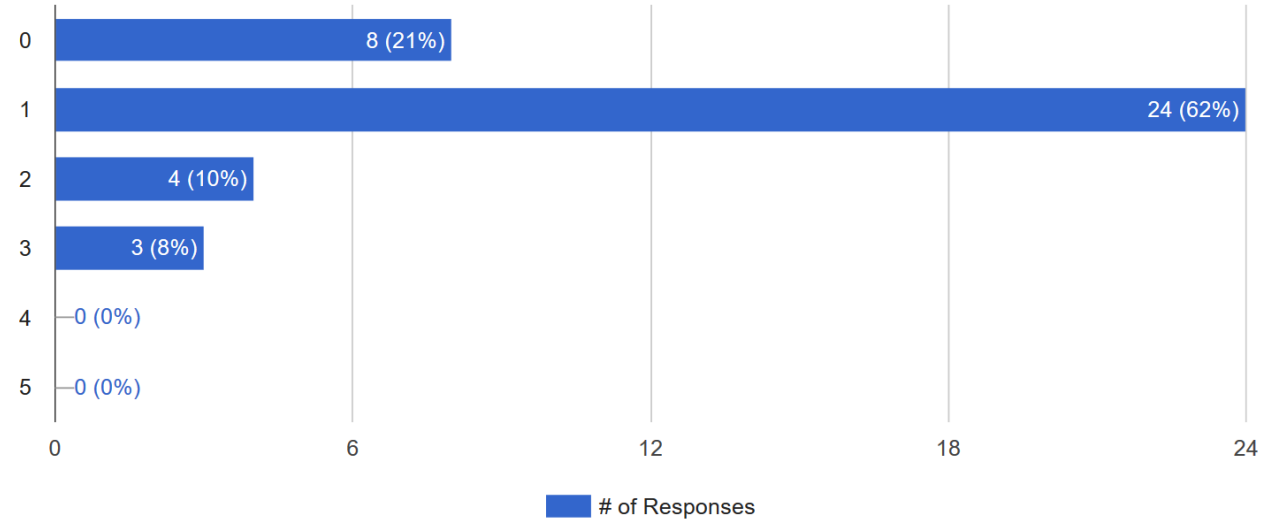


Axial view of subcutaneous, intramuscular, and rectus sheath infiltrations (1 - 3 and 6 & 7)

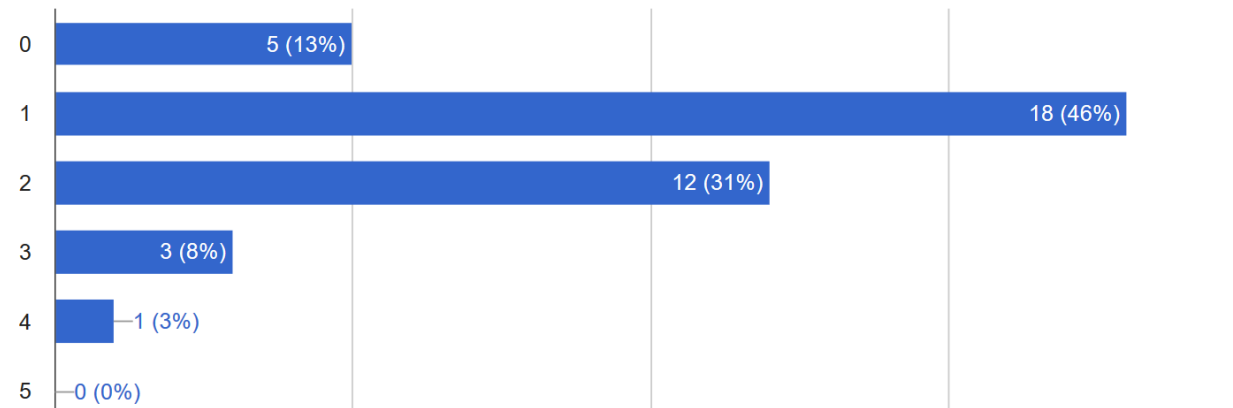


- Infiltration of Local Analgesic
- Dermis Incision
- Path of Needle Delivering Local Analgesic

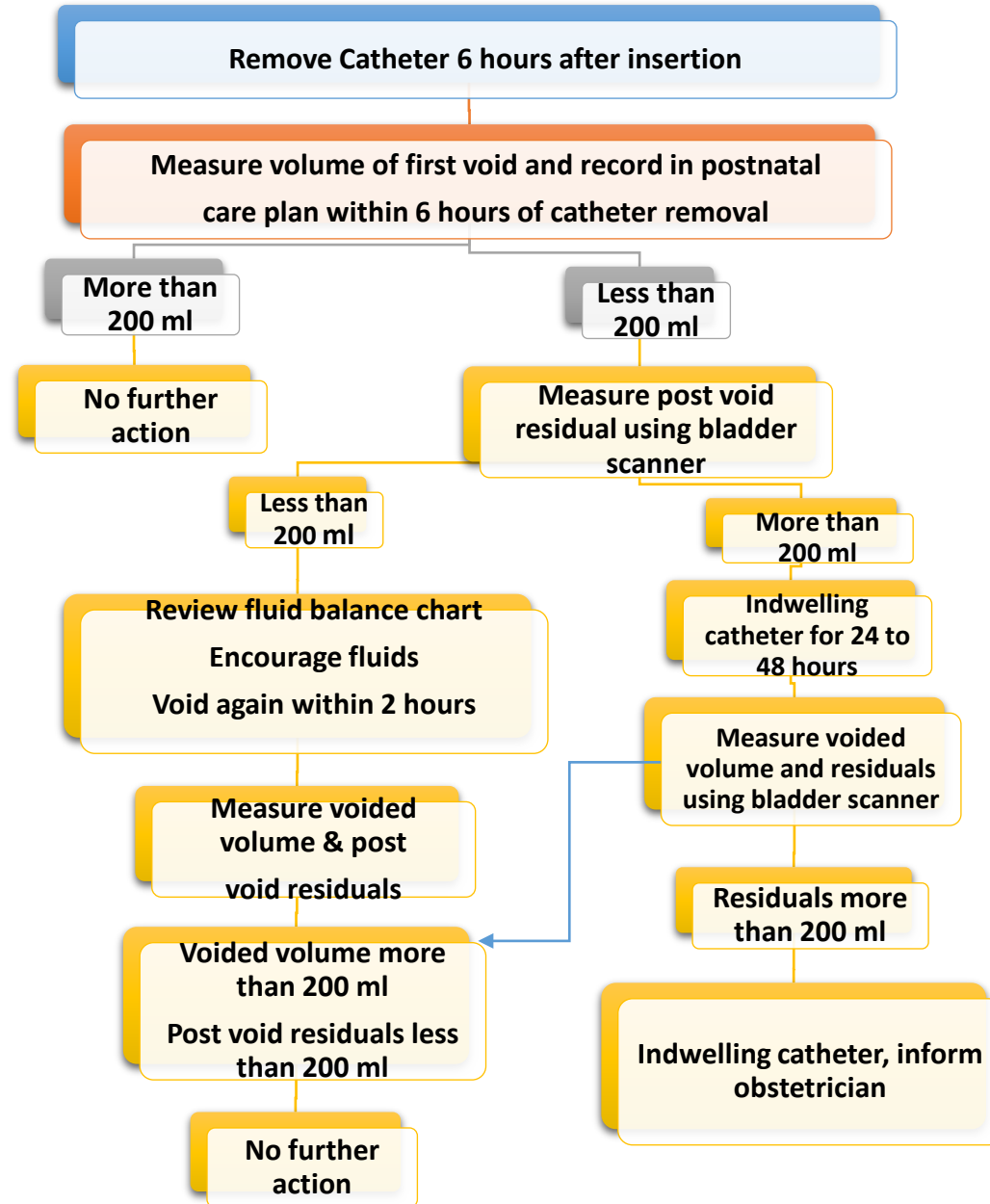
Did you feel any pain while resting or not moving yesterday?



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



GUIDELINES FOR BLADDER MANAGEMENT AFTER CESAREAN SECTION



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:

13:00 Lower limit	14:00	15:00	16:00	17:00	18:00 Median	19:00	20:00	21:00	22:00 Upper limit
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Great! 1 out of 12 milestones completed

Today's Milestones

1 out of 12 milestones completed



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 ✓



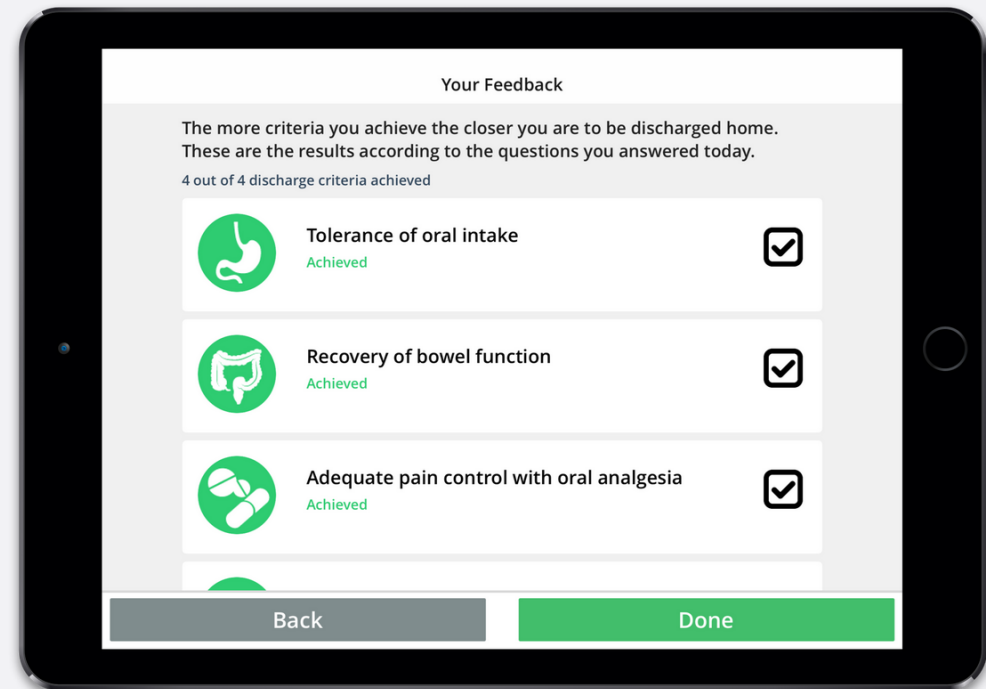
Drink liquids

Drink liquids (i.e. water, juice), as tolerated. Aim for at least 800 ml of liquids today.

OK, got it!

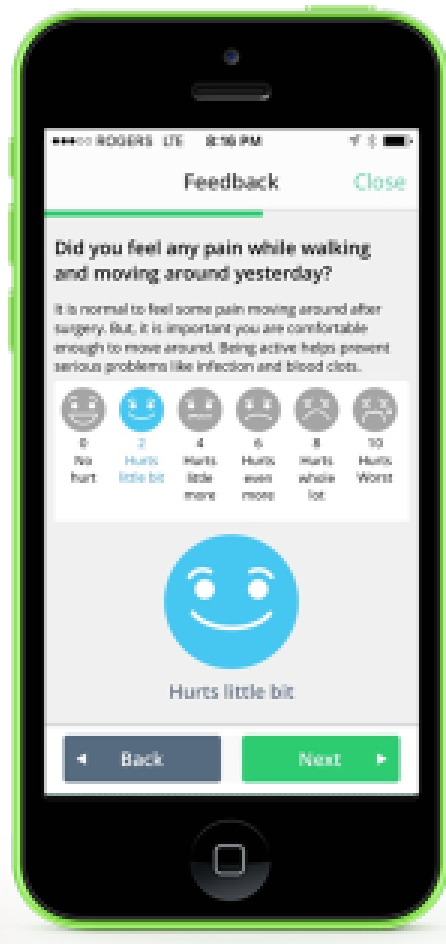
Engage patients in recovery with daily feedback

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.



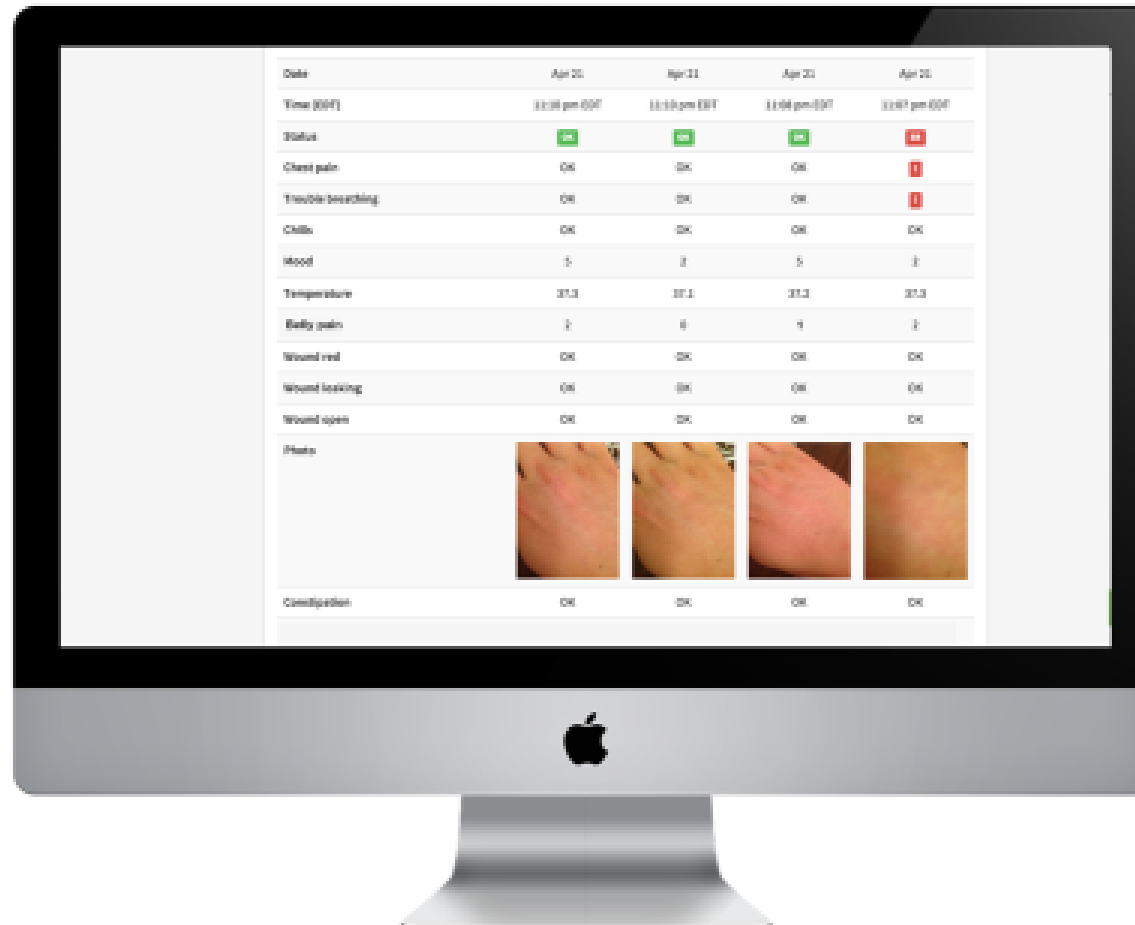
Empower self-management

Patients track progress & receive feedback for self-care.



Monitor patient progress

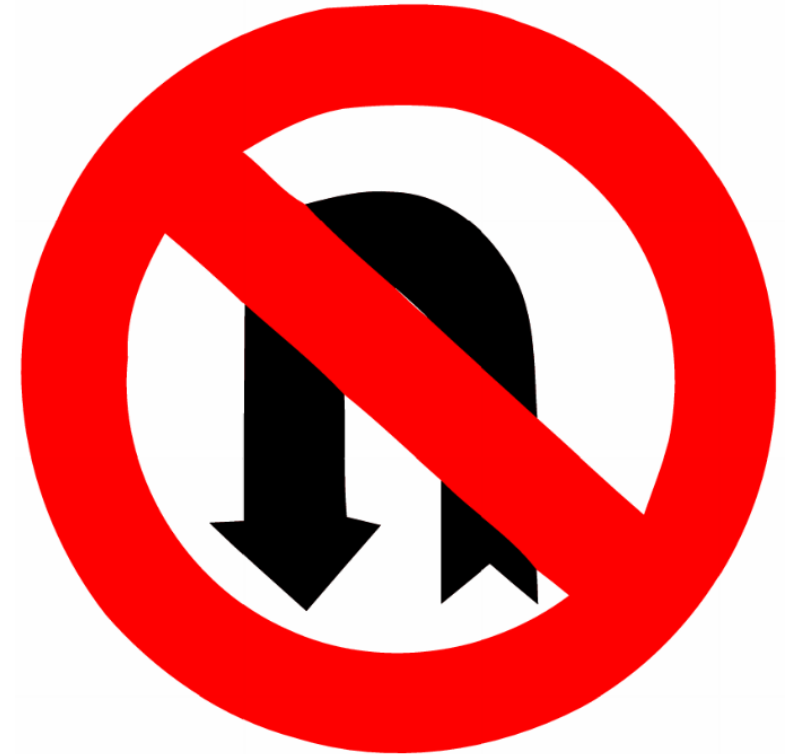
Care teams can track warning signs & recovery milestones.



Notify providers of at-risk patients

Alert care teams for early signs of complications.

Complications & Readmissions



ID	Last Name	First Name	Days since Signup	Post-Op Day	Info N/E	Channels	Care Plan	Surgeon	Surgery Date	Status	Actions
675	[REDACTED]	[REDACTED]	94	18			Published - v.2 - St. Peter's C-Section	Kristin Kinsler	November 9, 2016	Call your nurse	View Edit ★
646	[REDACTED]	[REDACTED]	85	23			Published - v.2 - St. Peter's C-Section	Michelle Huang	October 14, 2016	ER	View Edit ★
638	[REDACTED]	[REDACTED]	106	31			Published - v.2 - St. Peter's C-Section	Elizabeth Cherot	October 17, 2016	OK	View Edit ★
637	[REDACTED]	[REDACTED]	112	38			Published - v.2 - St. Peter's C-Section	Elizabeth Cherot	November 28, 2016	OK	View Edit ★
629	[REDACTED]	[REDACTED]	118	39			Published - v.2 - St. Peter's C-Section	Michelle Huang	October 14, 2016	Education	View Edit ★
624	[REDACTED]	[REDACTED]	133	57			Published - v.2 - St. Peter's C-Section	Elizabeth Cherot	November 16, 2016	OK	View Edit ★

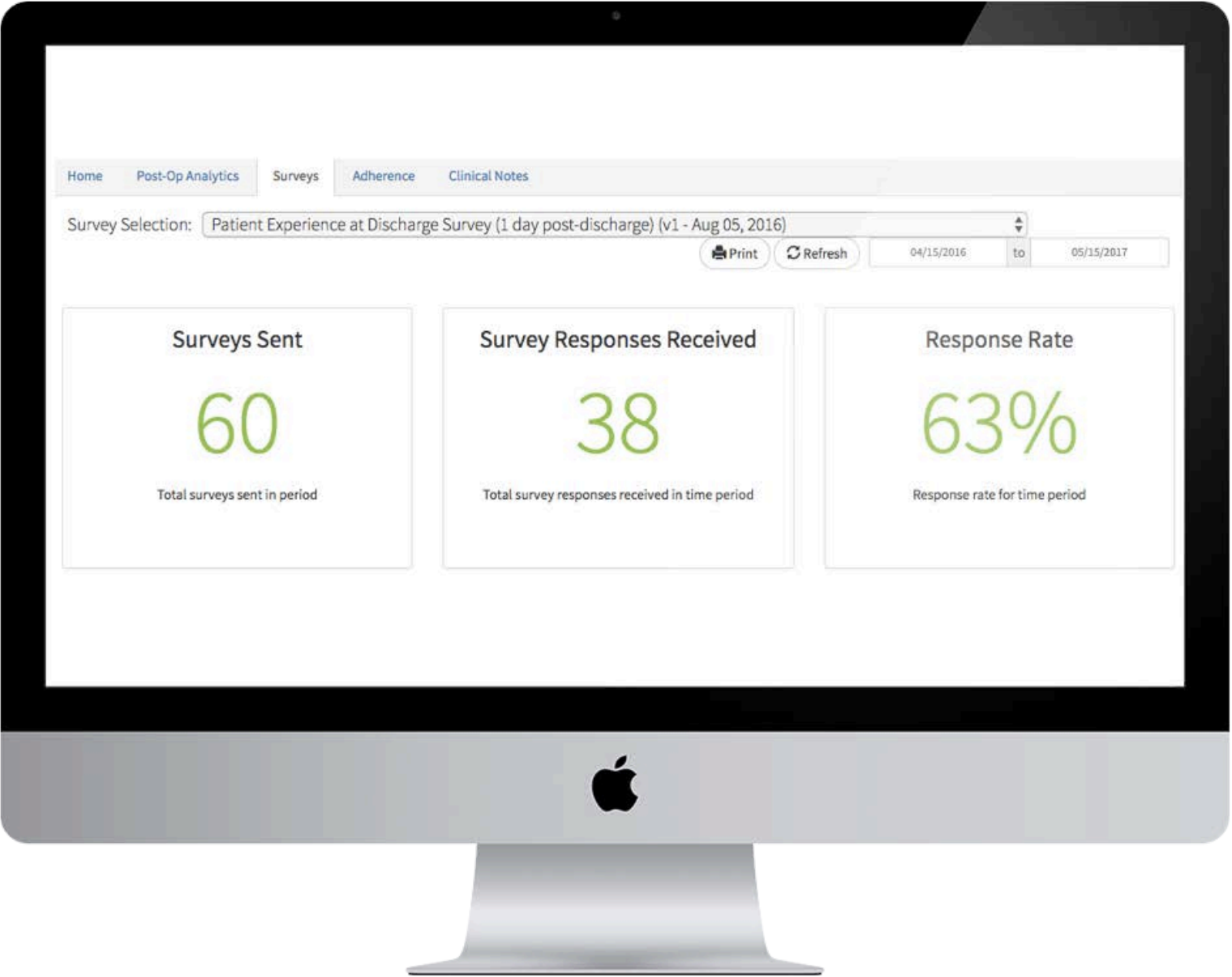


Date	Nov 06	Oct 31	Oct 24	Oct 23
Time (EDT)	7:27 am EST	6:16 pm EDT	6:03 pm EDT	2:19 pm EDT
Status	ER	ER	Call your nurse	Call your nurse
Mood	2/6 - Somewhat happy	0/6 - Neutral	-2/6 - A little down	4/6 - Very happy
Pain in lower belly	10	10	8	4
Pain medicines	Yes	No, forgot to bring it	No, forgot	Yes
Fluid leaking	OK	I	OK	OK
Wound splitting open	OK	OK	OK	OK
Red bump on wound	OK	OK	OK	OK
Temp. > 100.4°f (38°c)	No	No	No	No

Self-tracking	Nov 06	Oct 31	Oct 24	Oct 23
	my wound is leaking however there is brown color "like dirt" when i wipe and only 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 substance. i cannot seem to stay away sitting up.	my under belly and top vagina is numb. outside 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





Home Post-Op Analytics Surveys Adherence Clinical Notes

Survey Selection: Patient Experience at Discharge Survey (1 day post-discharge) (v1 - Aug 05, 2016)

Print

Refresh

04/15/2016

to

05/15/2017

Surveys Sent

60

Total surveys sent in period

Survey Responses Received

38

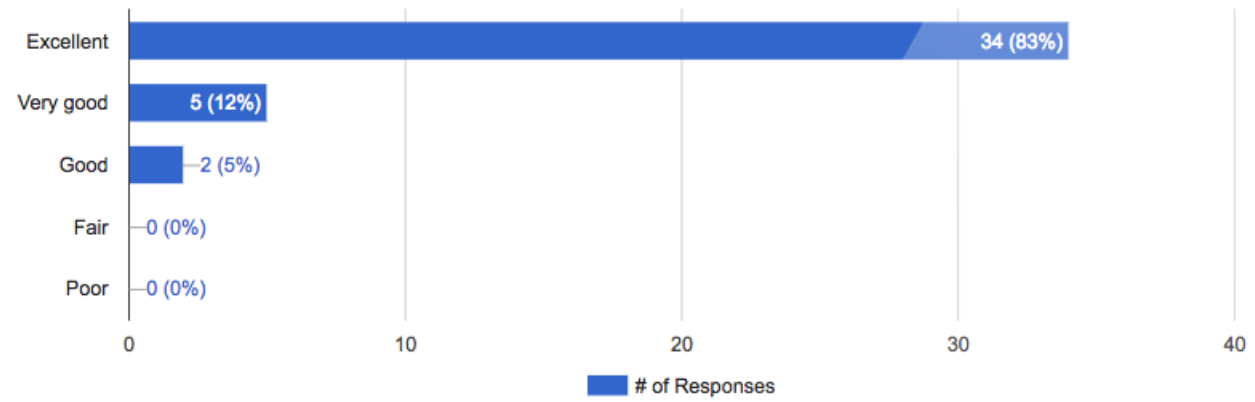
Total survey responses received in time period

Response Rate

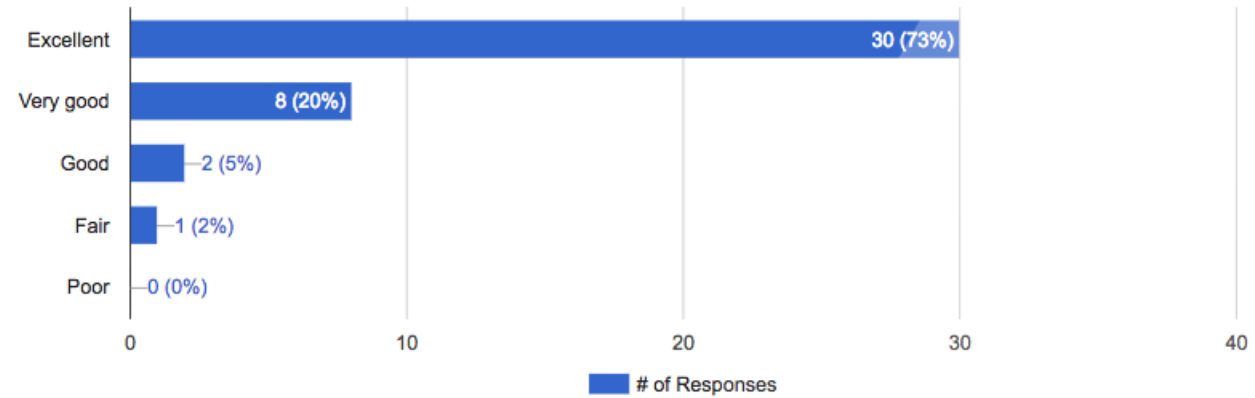
63%

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?

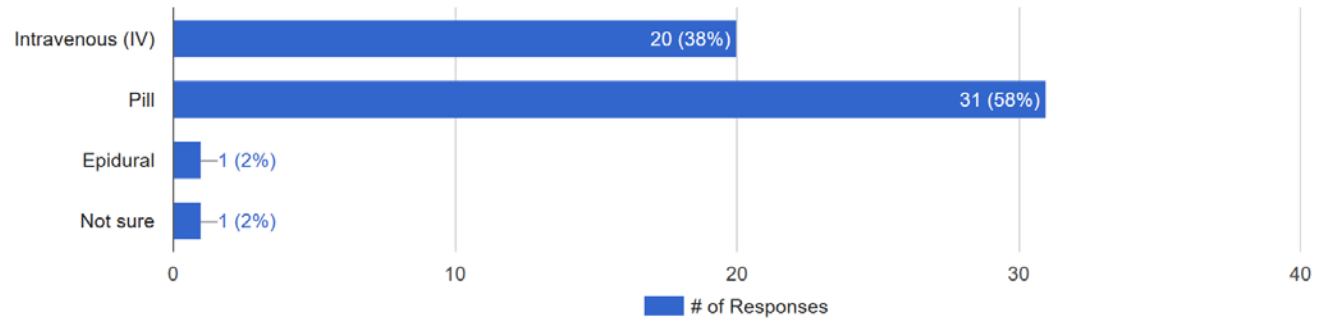


How well did the care team do with keeping your caregiver(s) and/or family member(s) updated on how you were doing during your surgery?

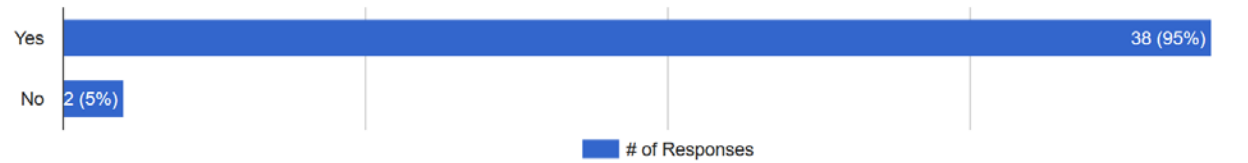


of Responses

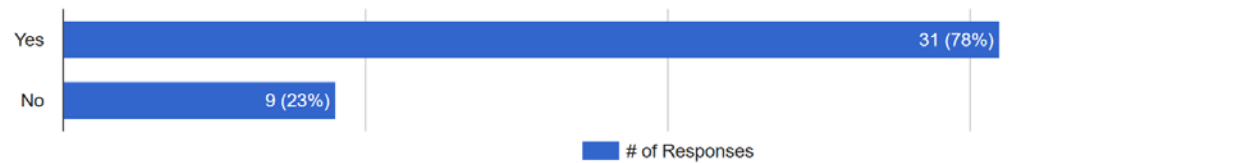
How did you get your pain medicines after surgery yesterday?



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



Did your nurse take off your urinary catheter yesterday?



Date	May 28	May 20	May 18
Time (EDT)	11:21 am EDT	1:47 pm EDT	9:11 am EDT
Status	Education	Education	Education
Mood	0/6 - Neutral	0/6 - Neutral	2/6 - Somewhat happy
Pain in lower belly	2	4	4
Pain medicines	No, not feeling pain	Yes	Yes
# narcotic pills	0	0	0
Eating healthy	No, ate enough but not healthy	Yes	Yes
Dark yellow/brown urine	OK	OK	OK
Urine <4 times/day	OK	OK	OK
Dry lips and mouth	OK	OK	OK
Dizziness/light-headed	OK	OK	OK
Headache	OK	OK	OK
Fainted or passed out	OK	OK	OK
Trouble urinating	OK	OK	OK
Diarrhea	OK	OK	OK
Hard poo	OK	OK	OK
Not pooped for 3+ days	OK	OK	OK
Chest pain	OK	OK	OK
Calf pain	OK	OK	OK
Sudden trouble breathing	OK	OK	OK
Redness or warmth that is increasing	OK	OK	OK
Swelling/hardness	OK	OK	OK

Length of stay

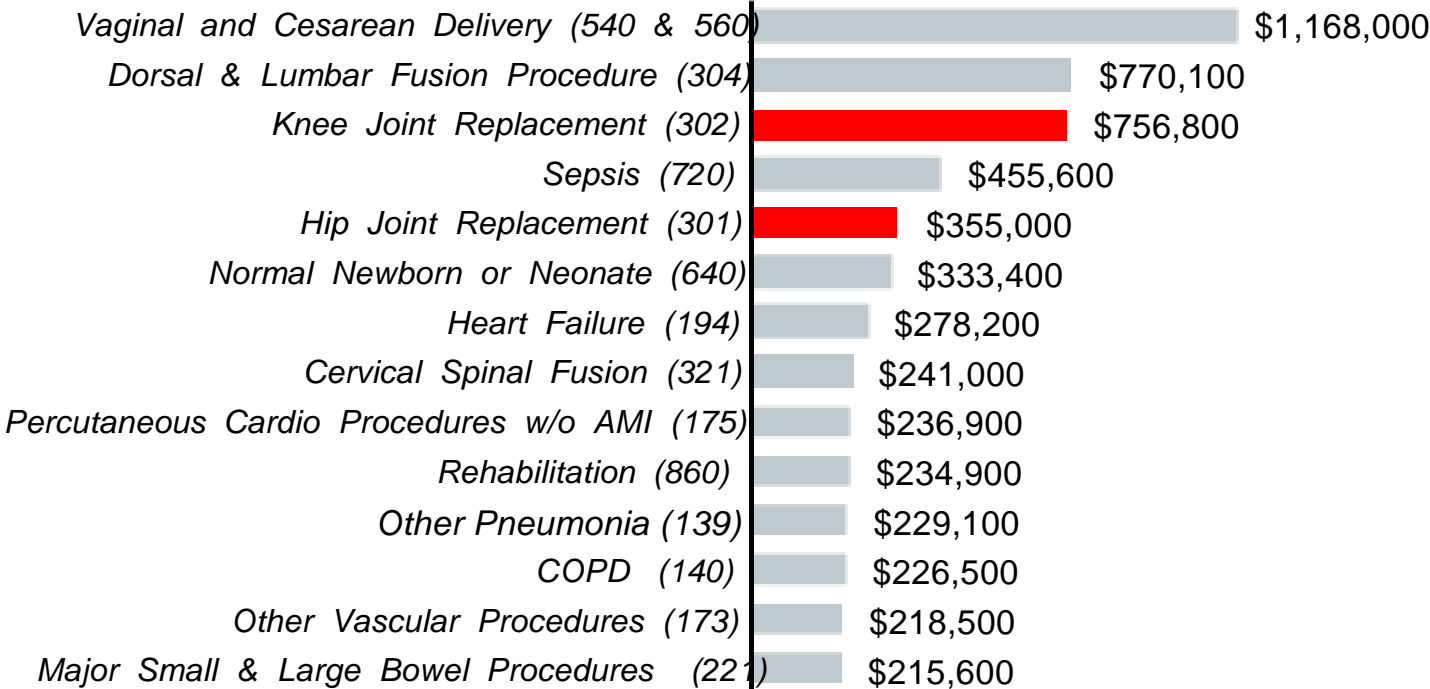


	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017
Patients enrolled in SeamlessMD	8	2	12	9	11
Patients activated their accounts within 7 days enrolled	75%	100%	100%	100%	90.91%
Number of patients who had surgeries on SeamlessMD	4	6	7	10	7
Average Length of Stay (Discharge day - Surgery Day)	3.5	2.4	2.7	2.7	2
% Patients checked-in within 7 days after surgery	25%	83.33%	57.14%	30%	57.14%
% Patients completed at least one health check	66.67%	100%	100%	80%	100%



Reducing Care Variation

Potential Hospital-wide Charge Savings by Reducing Variation



Direct variable cost

Per Patient	Supplies	Variable Labor	Variable Benefits	Drugs	Total Variable Costs per Day
Mother	\$ 159	\$ 576	\$ 176	\$ 26	\$ 937
Newborn	\$ 29	\$ 418	\$ 125	\$ 7	\$ 579

Variable cost savings

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

Program cost

Costs	Annual no. of ERAS cases		
	100	250	500
Implementation costs, \$			
Perioperative Surgical Home Learning Collaborative (year 1)	25,000	25,000	25,000
Physician/Nursing leadership time (year 1 only, 0.1 FTE)	0	60,000	60,000
Capital expenses, equipment (year 1 only)	500	12,500	24,000
Annual costs, \$			
Personnel			
Project manager (0.5 FTE)	0	40,000	40,000
Preoperative support (0.25 FTE)	0	20,000	20,000
Materials			
Education materials	5,000	12,500	25,000
Carbohydrate drinks/nutrition supplements	1,500	3,750	7,500
Disposable materials related to fluid warmers, heating blankets or other ERAS equipment and additional medication cost	16,000	40,000	80,000
Total first year costs, \$	48,000	213,750	281,500
Annual maintenance costs, \$	22,500	116,250	172,500
Cost per patient, year 1, \$	480	855	563

Net cost savings 1st year

Year 1	ERAS cases per year								
	100			250			500		
Net cost savings per day of LOS	.75	1	1.25	.75	1	1.25	.75	1	1.25
Conservative scenario, LOS 0.75 d (\$ in thousands)	37	66	94	0	71	142	145	288	430
Example scenario, LOS 1.0 d (\$ in thousands)	66	104	142	71	116	261	288	377	667
Optimistic scenario, LOS 1.25 d (\$ in thousands)	94	142	189	142	261	379	430	667	903

Net cost saving non-1st year

Non-year 1	ERAS cases per year								
	100			250			500		
Net cost savings per day of LOS	.75	1	1.25	.75	1	1.25	.75	1	1.25
Conservative scenario, LOS 0.75 d (\$ in thousands)	62	91	119	97	168	239	254	397	539
Example scenario, LOS 1.0 d (\$ in thousands)	91	129	167	168	213	358	397	486	776
Optimistic scenario, LOS 1.25 d (\$ in thousands)	119	167	214	239	358	476	539	776	1,012

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