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Labor and Delivery Scheduling Program
An Overview

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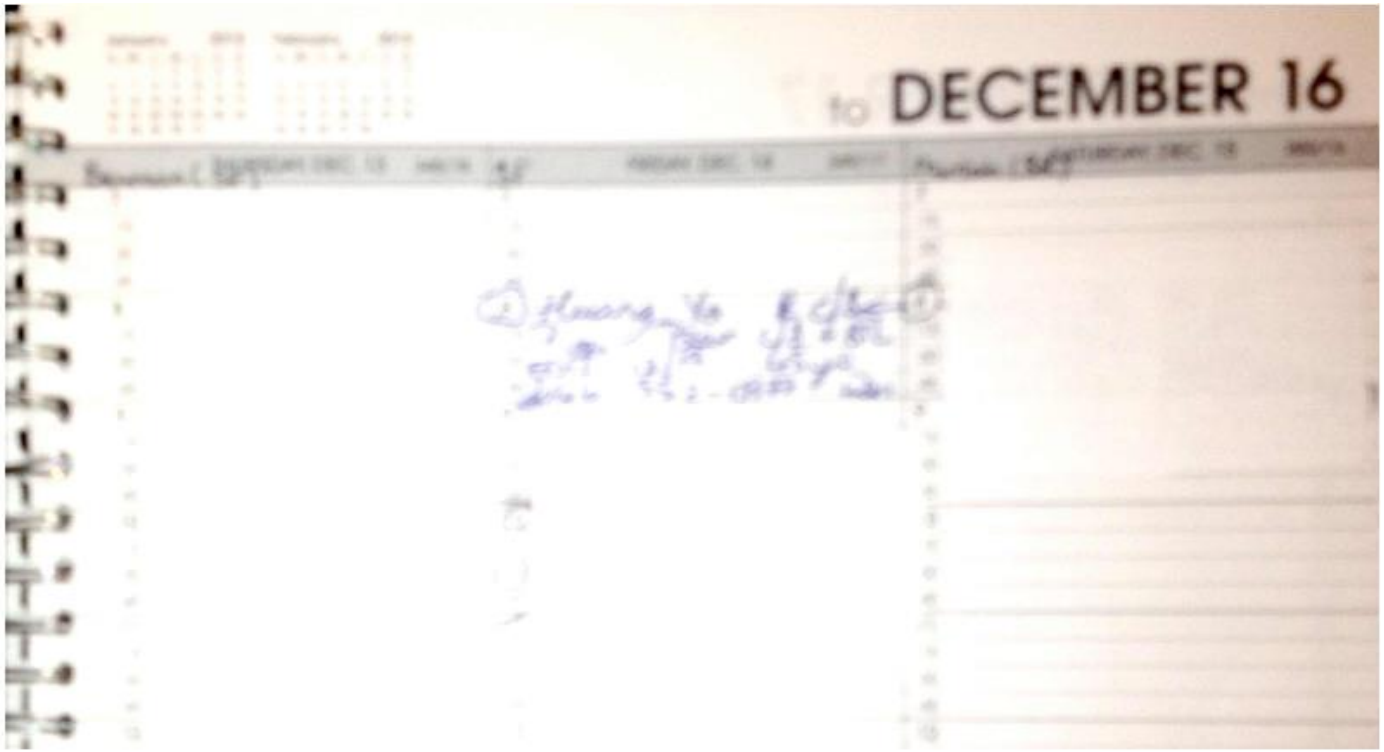
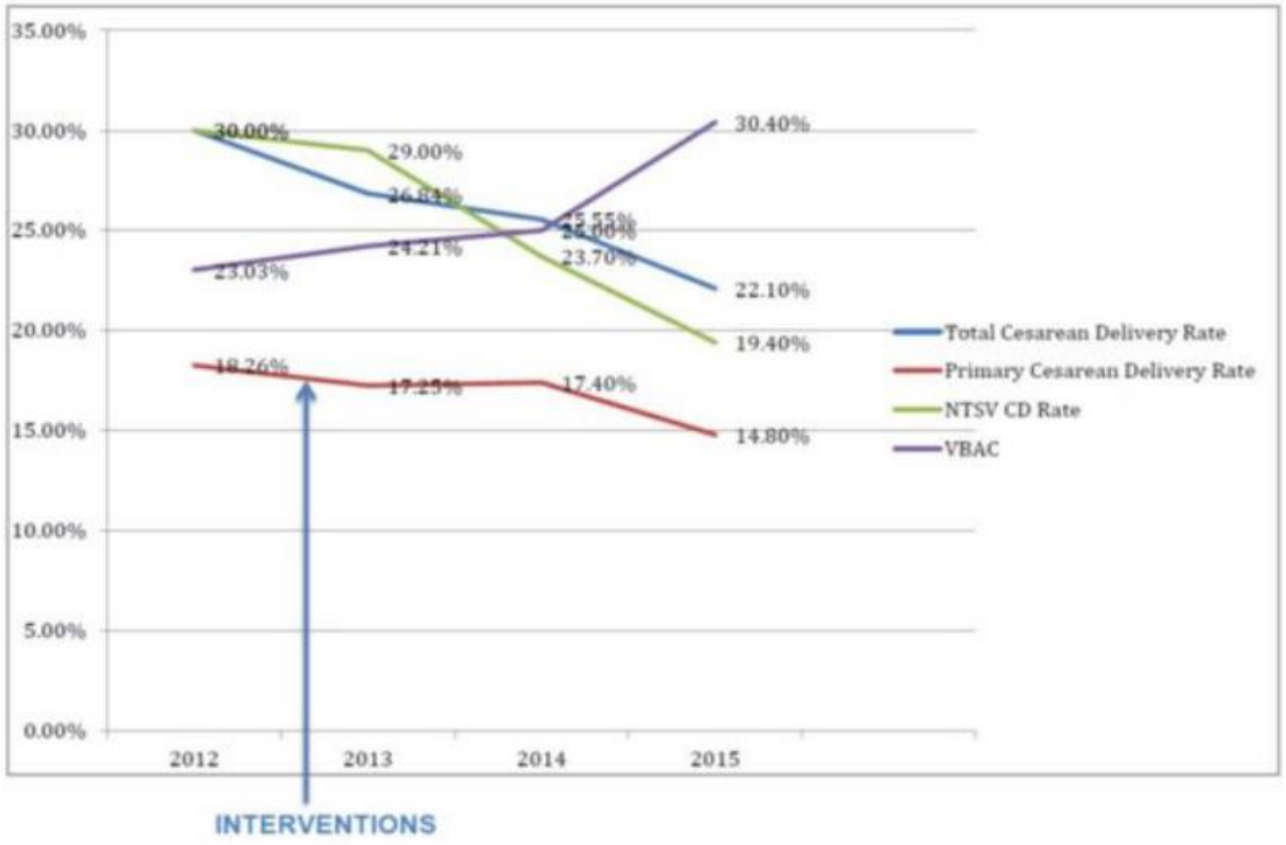


The former method of scheduling

Table 1.

Year	Total Cesarean Delivery Rate	Primary Cesarean Delivery Rate	NTSV CD Rate	VBAC	Elective Singleton Induction <39 wks
2012	30.00%	18.26%	30.00%	23.03%	0.00%
2013	26.84%	17.25%	29.00%	24.21%	0.00%
2014	25.55%	17.40%	23.70%	25.00%	0.00%
2015	22.10%	14.80%	19.40%	30.40%	0.00%

Figure 1.



Successful adoption and acceptance of a full-time laborist model in a community-based hospital

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Objective

Our goal is to demonstrate how a full-time laborist program was fully integrated and accepted into a busy urban hospital serving voluntary medical staff from the community while improving quality metrics including the reduction in Total Cesarean Sections (CS), Primary CS, and Nulligravida Term Singleton Vertex CS rates.

Study Design

This was a retrospective study of CS rates from 2012-2015 at a single center following the institution of a comprehensive program to improve quality and safety. Key components of the program included: (1) Recruitment of a Medical Director and 4 full-time laborists with no private practices of their own who provided 24/7 oversight and supervision of all patients on the unit. (2) A web-based electronic scheduling program with decision support and hard stops was implemented for scheduled CS and labor inductions. (3) A collaboration was established between the laborists and the hospital's Maternal-Fetal Medicine (MFM) specialists to provide external cephalic version (ECV), second-opinion consultations for elective primary CS, and consultations for all patients admitted less than 36 weeks' EGA; and a midwifery practice to promote vaginal birth. (4) A full-time Patient Safety Nurse was recruited to assist the Medical Director to facilitate communication, team training, data collection and analysis, and best practices such as safety huddles for laborists and nurses. Data was extracted from an integrated electronic medical record for analysis.

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Features

- Enhances patient safety, obstetrical team efficiency, documentation clarity, patient engagement
- Permits Labor and Delivery administrators to assure that the timing of scheduled deliveries are appropriate and within guidelines.
- Customized decision support algorithms based on current evidenced-based guidelines –or customized to organization guidelines to assure compliance with timing of scheduled deliveries for each indication.
- Provides a legible and organized schedule for inductions of labor, C-sections, and other necessary scheduled procedures Algorithms will assure that only one procedure of one type (i.e. induction of labor vs. C-section) will be scheduled per desired day, date and time slot. The day, date, month and time of scheduled procedures will conform with scheduling requirements of **your** Department
- Introduces hard stops and decision support for all scheduled inductions of labors and cesarean sections
- Prints out daily schedule for all Team members

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Features

- Enables an opportunity for discussions between providers and patients about timing of inductions of labor, trials of labor, versions, ambulation, returning to home during latent phase labors, etc.
  (i.e., encourages Shared Decision Making)

- Encourages discussions between providers and MFMs regarding indications, management plans, etc.

- Automatic calculations of
  - Gestational Age
  - BMI

- If needed, considerations for blood management / *cell saver* reservations are built into a mandatory input field. A schedule for those patient's requiring cell saver can then be accessed by the Blood Management / Perfusionist Team and they can be prepared and available for the procedure

- Maintains a robust, anonymized searchable SQL database to collect, store and retrieve anonymized data for clinical use and future statistical evaluation / research

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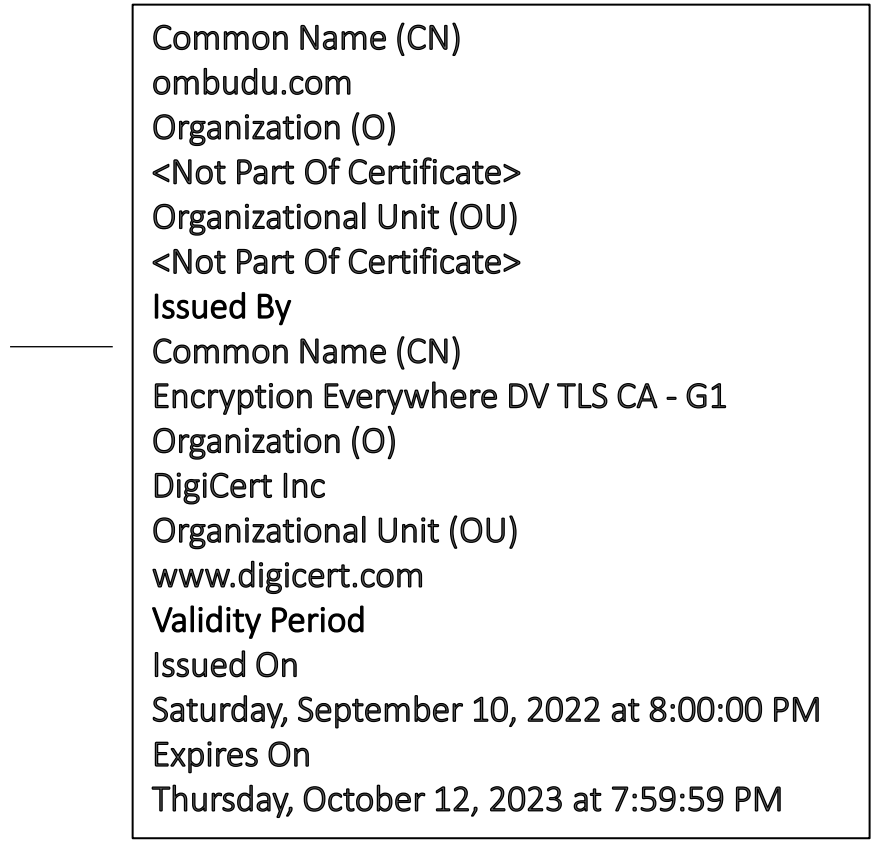
IT Model for the program

- Anonymized data-no PHI
  - Patient's name and pertinent information is printed on a program-generated hand-out form but *not stored* on any servers
- All software is web-based, original and proprietary
- Program and data files resides on encrypted SSL secure servers of Hygeia Health System, LLC. (vendor is Yahoo / Verizon.
- To assure HIPAA compliance, program must be cleared by institution HIPAA Officer and IT Department
- Workflow developed to eliminate need for collection, storage and retrieval of protected health information (PHI)



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Requirements to complete customization prior to go-live implementation

- Names and email addresses of all TEAM users including physicians, nurses, APRNs, PA's, midwives who will require access to program. These will be used to develop an initial authorized user table.

- Names and email addresses of all ADMIN users

- Names and email addresses of all designated ADMIN users of program

- Names and email addresses of MFMs and others(i.e. laborists) who will grant approval to ***non-conforming*** dates, times and indications of procedures. When this is required, internal decision support will permit the scheduling of the program.

- Correct Timing of procedures per individual, institution guidelines-see example below

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An example of current timing of delivery guidelines incorporated into LDSP. These can be customized to institutional needs and guidelines.

Recommended Timing of Delivery for Maternal or Fetal Indications for which MFM approval **IS REQUIRED**

Indications for Delivery	
Chronic HTN well-controlled on meds	$37^{0/7}$ - 39-$^{6/7}$
Chronic HTN poorly controlled	$36^{0/7} – 37^{6/7}$
GDM poorly controlled or evidence of diabetic fetopathy	$37^{0/7} – 38^{6/7}$
Pregestational DM, poorly controlled, or evidence of diabetic fetopathy	$36^{0/7} – 38^{6/7}$
IUGR <10th percentile with normal testing	$37^{0/7} – 39^{6/7}$
IUGR <10th percentile with abnormal testing	Individualize
Prior IUFD	Individualize and document discussion
Isolated oligohydramnios (AFI <5cm)	$37^{0/7} – 37^{6/7}$
Cholestasis of pregnancy	$36^{0/7} – 37^{6/7}$
Monochorionic/diamniotic twins, uncomplicated	$36^{0/7} – 37^{6/7}$
Monoamniotic twins, uncomplicated	$32^{0/7} – 34^{6/7}$
Triplets and higher order multiples	Individualize

Recommended Timing of Delivery for Maternal or Fetal Indications for which MFM approval is **NOT** required

Indications for Delivery	
Advanced maternal age 35-39	$40^{0/7} – 40^{6/7}$
Advanced maternal age ≥ 40	$39^{0/7} – 39^{6/7}$
Chronic HTN well-controlled on no meds	$38^{0/7}$ - $39^{6/7}$
Gestational HTN	$37^{0/7} – 38^{6/7}$
Preeclampsia without severe features	At time of diagnosis after $37^{0/7}$
GDM on diet, glyburide, metformin, or insulin well-controlled and no evidence of diabetic fetopathy	$39^{0/7} – 41^{0/7}$
Pregestational DM, well controlled, and no evidence of diabetic fetopathy	$39^{0/7} – 39^{6/7}$
PPROM	$34^{0/7} – 35^{6/7}$
Dichorionic/diamniotic twins, uncomplicated	$38^{0/7} – 38^{6/7}$
3 previous C-sections or greater	$37^{0/7} – 39^{0/7}$
Prior classical C-section	$37^{0/7}$ - $37^{6/7}$
Complete placenta previa	$36^{0/7}$ - $37^{6/7}$
Suspected placenta accreta	$36^{0/7} – 36^{6/7}$
Prior myomectomy involving extensive uterine surgery	$36^{0/7}$ - $37^{6/7}$
Vasa previa	$35^{0/7}$ - $36^{6/7}$

REFERENCES:

ACOG Practice Bulletin #107, 2009; Reaffirmed 2015
Spong et al. Obstet Gynecol. 2011 August; 118(2 Pt 1): 323-333.
ACOG & SMFM Obstetric Care Consensus. March 2014

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Deliverables to Institution

1. Trial period to use in demo mode for one month.

2. After one month, subscription to use program will begin on month-to-month basis. Implementation and subscription terms will be forthcoming.

3. Personal in-service instructions on the use of program will be provided.(via 'ZOOM' or phone). During trial period and beyond, full support for program will be provided during *usual* business hours.

4. Custom-developed decision support and algorithms based on information given to me prior to implementation if different from currently implemented guidelines.

5. If subscription is cancelled, all data in database will be transferred to Department in CSV and /or SQL format.

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Work Flow and Features

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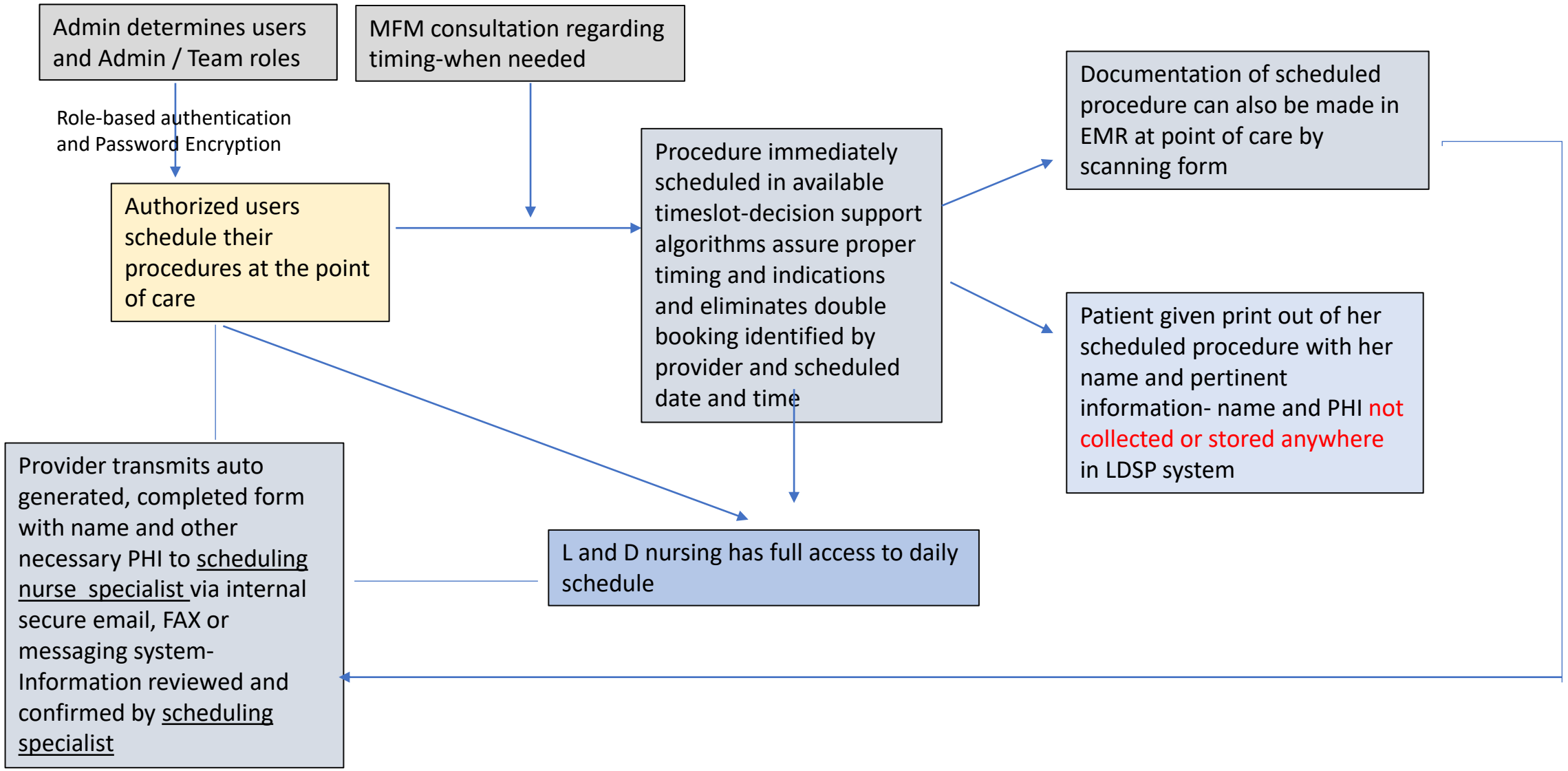
Workflow



To address issues of HIPAA and Security, the program will only collect and store non-PHI information such as:

a. Procedure Date Time
b. Gestational Age
c. Maternal Age
d. Provider Name
e. BMI
f. Procedure
g. # C-sections
h. Indication
i. Approved by If needed
j. Approval Confirmation if needed
k. Comments and Special Requests

At the time of scheduling the patient at the point-of-care, the patient will receive a printout of her scheduled appointment. This printout will also be transmitted to the scheduling nurse who will review and file. In this way, the appointment will be scheduled per rules defined by the department and reviewed and rechecked by the scheduling nurse. For details, please see the algorithm appendix 3 below and on the accompanying PDF.

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TEAM MENU

1. Schedule Procedure
2. View the Schedule for a given date(check if time is available)
3. View my Schedule by date
4. View All My Scheduled Patients
5. Cancel My Patients

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Admin Menu

AUTHORIZATION AND REGISTRATION

- Authorize a Team User
- Register new Team user

- Authorize an Admin User
- Register new Admin user
- View All Team Users
- View All Adnmins

ADMIN TASKS

- View Scheduled Cases for Given Day
- Review All Scheduled Cases and / or Cancel Procedures

ADMIN Scheduling

- General Scheduling
- Admin Scheduling-without indication-timing constraints
- Confirmation of MFM / Admin approval of non-conforming timing and indications

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- Reset Team User Password
- Reset Admin User Password
- Remove User and User Authorization
  - Step 1.
    - Remove Username and Password
  - Step 2.
    - Delete Authorization

DATA

- Full Data Search
- Data Dashboard

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January 03, 2023

This is the appointment information for **Joan Doe.**
Please bring this form with you on the day of your scheduled procedure.

Your provider is: mberman
Your requested procedure is: Primary C-Section
Your requested indication for the procedure is: Breech
Your scheduled date: Monday 2023-01-09
Your scheduled time: 0800 hrs

--------Other Information----------

If C-Section, what number is this c-section?: 1
Cell Saver Ordered: No
Calculated Gestational Age: 40
Maternal Age: 28
Gravida: 1
Para: 0
BMI: 26.31
Bishop Score: NA
GBS: Negative
AFI: NA
EFW: < 4000 Grams
Your procedure is approved by: NA

You have been scheduled
at **40** weeks gestation.

Your procedure has been approved and is scheduled.
This is your confirmation. Please check it for accuracy.
We will contact you if there is a question regarding the
procedure or an unexpected need to change the day and time.
Please contact us with any questions.

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Patient Auto-generated Print Out with PHI included- this is handed to patient at time of visit and transmitted to Scheduling Nurse Specialist

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This is the actual daily schedule of above example available to Team without PHI

Procedure Date Time;	Gestational Age	Maternal Age	Prov Name	BMI	Procedure	# C-sections	Cell Saver	Indication	Approved by If needed	Approval Confirmation	Comments and Special Requests
2023-01-09 0800 hrs	40	28	mberman	26.31	Primary C-Section	1	No	Breech	NA		None

Scheduled Procedure Documentation

PROCEDURE DATE AND TIME: 2023-01-09 0800 hrs
PROVIDER: mberman
PROCEDURE: Primary C-Section
 # C-SECTION: 1
CELL SAVER: No
INDICATION: Breech
APPROVED BY-if needed: NA
CALCULATED GESTATIONAL AGE: 40
METHOD TO DETERMINE EDD: US Dating < 20 weeks
DATE EDD DETERMINED : 2022-08-02
MATERNAL AGE: 28
GRAVIDA: 1
PARA: 0
BISHOP SCORE: NA
HEIGHT: 67
WEIGHT: 168
BMI: 26.31
GBS STATUS: Negative
IF OLIGOHYDRAMNIOS-AFI: NA
IF MACROSOMIA-EFW: < 4000 Grams
COMMENTS: None