

# Promotion of Safe Vaginal Delivery (PVD): Optimizing Obstetrical Care

## Tennessee Initiative for Perinatal Quality Care

### Inter-Institutional Quality Improvement Project

In Association with The American College of Obstetricians and Gynecologists' (ACOG)  
Alliance for Innovation in Maternal Health (AIM)

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## Introduction: What are we trying to accomplish?

### The Problem

From 1998 to 2008, cesarean birth rates in the United States rose from 22% to 33% of all births[1], making it the nation’s most common hospital surgery. The extraordinary rise and remarkable variation in rates of cesarean birth create concern for both the quality and cost of maternity care. As well, the overuse of cesarean birth has proven to be a consistent barrier to providing high-value, high-quality maternity care.

Even though rates of primary and total cesarean birth have recently leveled, there was a rapid rise in cesarean birth rates from 1996 to 2011 specifically (Figure 1). Thirty states and the District of Columbia have Cesarean delivery rates for first-time mothers with low-risk deliveries that are above the Health People 2020 goal of 23.9%. Nationally, Tennessee is in the highest quartile of cesarean birth rates (Figure 2) at 34.2%.[2] Based on 2015-2019 Tennessee Department of Health Vital Statistics data, 75% of TN hospitals have a cesarean birth rate above 20% (Figure 3).[3] There is notable variation in cesarean birth rates among the birthing hospitals in Tennessee, with 31 percentage points separating the facilities with the highest and lowest cesarean rates, 42% versus 11%. According to LeapFrog data[4], the rate of cesarean births among nulliparous, term, singleton, vertex (NTSV) pregnancies range from 11% to 42% among responding TN birthing hospitals (Figure 3 & 4).[5]

In addition, the percent of non-Hispanic Black low risk cesarean birth rates remain higher than all other ethnic groups in Tennessee (Figure 4). According to the recently released 2022 Tennessee Maternal Mortality Report, “Non-Hispanic Black women were 2.5 times more likely to die than white women” during pregnancy or up to one year after pregnancy.[6] Disparities in care are noted in

Figure 1: U.S. Delivery rates, 1969-2011

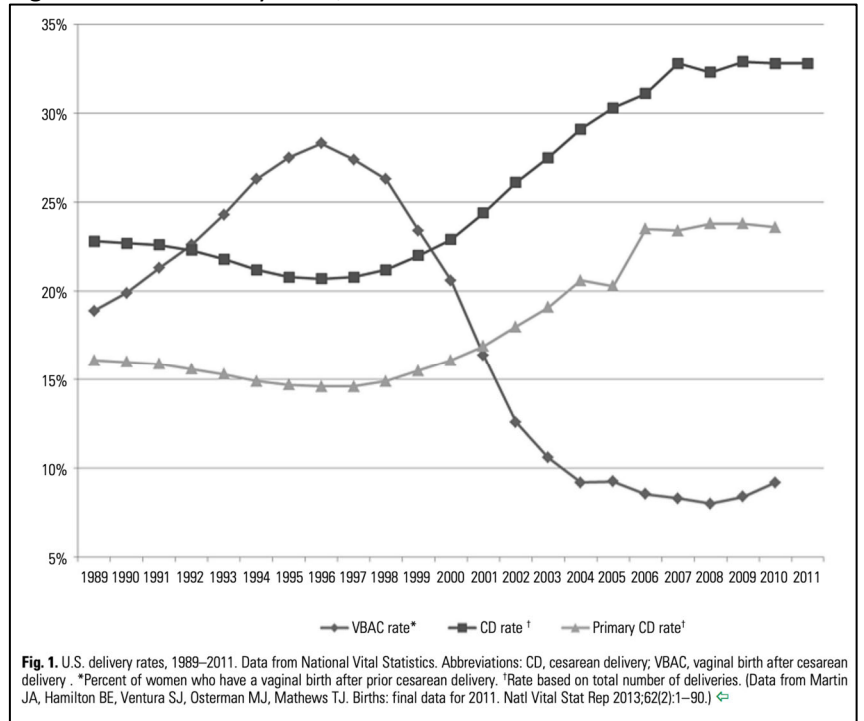
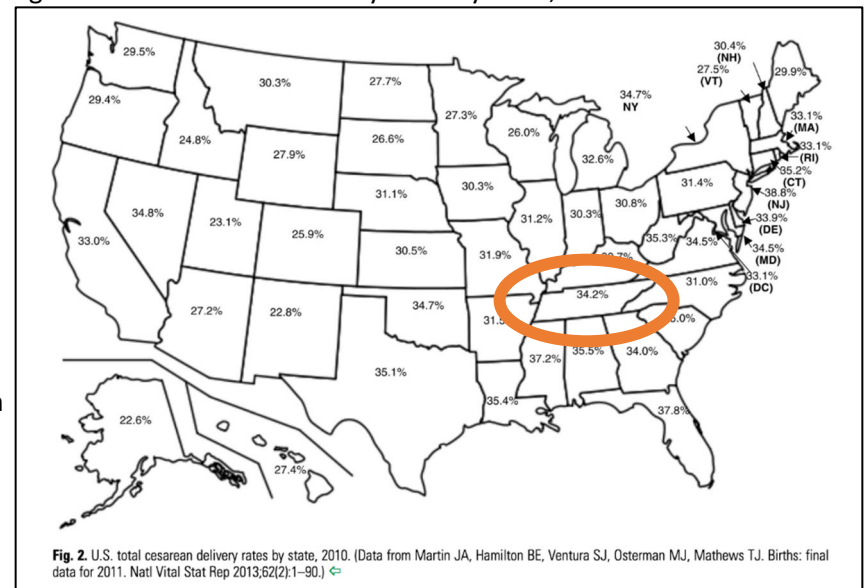


Figure 2: U.S. cesarean delivery rates by state, 2010



(Source: Safe prevention of the primary cesarean delivery. *Obstetric Care Consensus No. 1. American College of Obstetricians and Gynecologists. Obstet Gynecol* 2014;123:693–711.)

Figure 3: TN Percent Cesarean Deliveries Across Birthing Centers

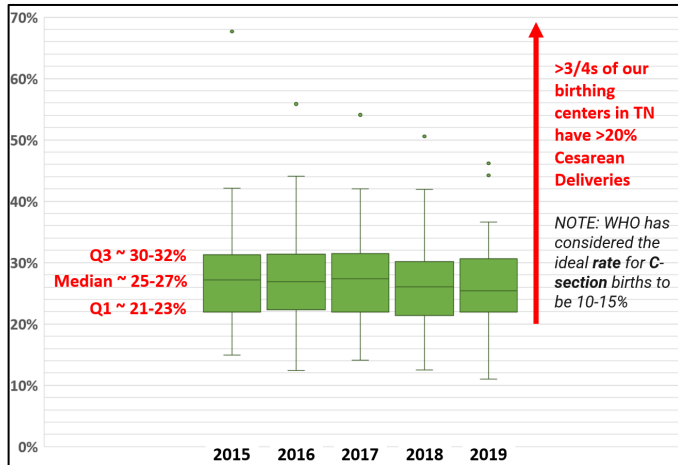
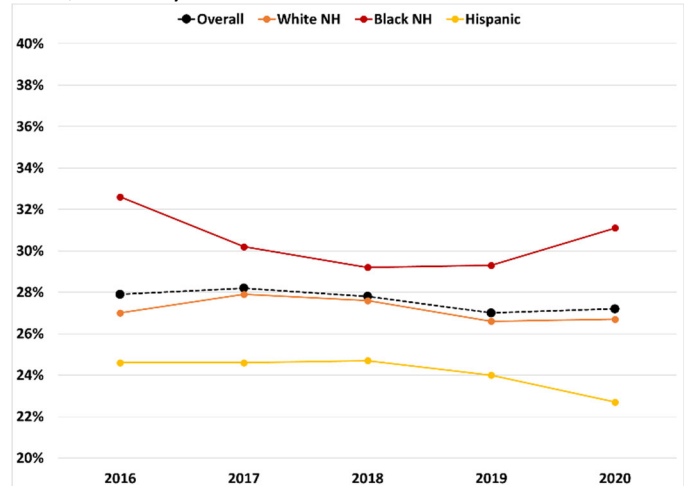


Figure 4: Rates of Low-Risk Cesarean Delivery by Race/Ethnicity in TN Residents.



multiple factors such as cesarean birth rates, preterm births, breastfeeding rates, and other areas TIPQC will continue to address through QI hospital team engagement in projects.

The most important group to focus on for cesarean birth reduction (safe vaginal birth promotion) and labor support are pregnancies that are considered Nulliparous, Term, Singleton, and Vertex (NTSV). NTSV is defined as first pregnancy beyond 20 weeks gestation (Nulliparous) with a >37 weeks gestation or full-term (Term), single baby in utero (Singleton) in the head down presentation (Vertex). These factors represent the most favorable set of conditions for successful vaginal birth while simultaneously carrying the highest rate of labor complications. It is also the largest contributor to the rise in cesarean rates and exhibits the greatest variation for all subpopulations of cesarean births for both hospitals and providers. The NTSV population can be compared between states, hospitals, and even providers.

## The Response

In response to Tennessee’s cesarean birth rate ranking and the rising rate of cesarean births annually in the state leading to increased maternal and neonatal risks, a team of key stakeholders across the state have undertaken efforts to reduce the rate and improve quality of care. There is no argument that cesarean birth is a necessary and appropriate care plan for many and oftentimes is a lifesaving procedure for both mother and baby. However, the significant increase and notable variation in rates raise concerns for both the quality and cost of this procedure as it relates to maternity care. Additionally, the Joint Commission has referred to the rising cesarean birth rates as an “epidemic” with no evidence of improved outcomes.[7] It can therefore be concluded that this variation in care and rising rates make improvement in practice across the nation a necessity.

Healthy People 2030, the United States Department of Health and Human Services project that defines health goals for the entire country every 10 years, set a target cesarean birth rate for NTSV of 23.6% to reflect a more realistic and attainable rate when compared to the Healthy People 2010 goal of 15%.[8] In 2011, the California Maternal Quality Care Collaborative (CMQCC) published a white paper entitled *Cesarean Deliveries, Outcomes, and Opportunities for Change in California: Toward a Public Agenda for Maternity Care Safety and Quality* that outlined the use of the NTSV metric as the best measure for quality improvement of cesarean birth rates.[1] This landmark publication showed that a focus on the NTSV population not only controls for risk factors but also addresses the subpopulation that accounts for the most variation between hospitals. [1] In addition, the Joint Commission endorsed the NTSV metric in 2010 followed by adoption of its use as part of quality initiatives by several additional entities including the Leapfrog Group and the Centers for Medicare and Medicaid Services. Starting in January 2016, the Joint Commission required all hospitals with 300 or more births annually to report NTSV cesarean births as part of their perinatal core measure report.[1, 5, 7] In addition, the American College of Obstetricians and Gynecologists (ACOG) and the Society for Maternal-Fetal Medicine (SMFM) published the *Obstetric Care Consensus on Safe Prevention of the Primary Cesarean Delivery* in 2014 that outlined key clinical strategies to reduce non indicated cesarean births.[5] As well, in 2015, the Alliance for Innovation

on Maternal Health (AIM) released the *Safe Reduction of Primary Cesarean Births Bundle* with the goal of aiding birthing facilities by providing an evidence-based set of strategies that are easily adoptable to allow for safe reduction of primary cesarean birth rates.[9] The national commitment to reduction of cesarean births is evident.

Participation in the TIPQC “Promotion of Vaginal Delivery” (PVD) Project will help participating Tennessee birthing facilities meet recent recommendations from Healthy People 2030, the World Health Organization (WHO), the American College of Obstetricians and Gynecologists (ACOG), Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN), and the Society for Maternal-Fetal Medicine (SMFM).

## Expected Benefits

Overall, successful completion of the TIPQC PVD project is expected to generate the following benefits:

- 1) Reduction in maternal and neonatal risks
- 2) Reduction in related costs
- 3) Reduction in maternal morbidity and mortality
- 4) Reduction in nonindicated cesarean birth
- 5) Development of a uniformed labor progress assessment
- 6) Improved identification of those at low risk versus high risk of primary cesarean birth
- 7) Reduction in healthcare disparities
- 8) Increase in maternal satisfaction with birthing experience
- 9) Increase in shared decision-making regarding cesarean birth
- 10) Reduction in postpartum complications

For the majority of NTSV pregnancies, cesarean birth carries an increased risk of pregnancy-related complications for both mother and baby. Well recognized maternal risks include hemorrhage, venous thromboembolism, wound infection, anesthesia complications, increased pain, longer recovery times, prolonged hospitalization, delayed and difficulty with breastfeeding, and maternal death. Lesser recognized, long term and subsequent maternal risks include abnormal placentation, repeat cesarean birth, uterine rupture, postsurgical adhesions, bowel injury and obstruction, and delayed interval from incision to birth of the infant. In addition, there are many psychological risk factors including delayed and ineffective bonding with the infant and postpartum mood disorders including anxiety, depression, and Post Traumatic Stress Disorder (PTSD). Neonatal risks include increased risk of respiratory morbidity, NICU admission, prolonged hospitalization, risk of childhood asthma, and breastfeeding difficulty.[1, 5]

Cesarean birth has proven to be costly for many reasons. Studies of actual payments to hospitals and providers indicate that each cesarean costs \$5,000 to \$10,000 more than a vaginal birth.[10] Most women with a previous cesarean will undergo a second or third surgery, so the actual cost of a primary cesarean should be doubled or even tripled to reflect the true direct cost per patient over time. The California Maternal Quality Care Collaborative (CMQCC), developed a high-level economic model that conservative estimates show a potential annual savings in California of \$80 million to \$440 million, depending on the rate of cesarean reduction. [1]

## Aim Statement

The aim of this state-wide quality improvement (QI) project is:

To promote safe vaginal delivery for ALL in the birthing population presenting with a nulliparous, term, singleton, vertex pregnancy (NTSV) and thus decrease NTSV cesarean delivery rates to <23.6% (Healthy People Goal 2030)[9] in all participating Tennessee birthing facilities by Summer 2024. This project will include a special focus on the BIPOC (Black, Indigenous, and People of Color) population which data shows has greater disparities in this outcome.

## Project Overview

As stated, this project aims to reduce avoidable cesarean births in the NTSV population in all participating Tennessee birthing facilities by promoting safe vaginal delivery. The PVD project was selected by stakeholders at the 2021 TIPQC Annual Meeting. Project development occurred in Q1 and Q2 2022. The pilot phase of the project was Q4 2022. The start of the statewide roll-out of the project is planned for Jan 1, 2023. The project is proposed to end the Summer 2024.

TIPQC agrees to the following:

- Provide this toolkit and other resources to participating teams.
- Offer monthly huddles, quarterly learning sessions, and annual statewide meetings.
- Provide QI education to participating teams.
- Facilitate the sharing between participating teams, allowing them to learn from each other.
- Facilitate the capture of data metrics and provide reports to participating teams which show their progress towards improvement.
- Provide guidance and feedback to participating teams, facilitating their improvement and achievement of the project aim.

Submission and approval of a team's project application indicates their intent to participate in this statewide QI project.

Participating teams are expected to:

- Hold regular, at least monthly, team meetings.
- Regularly review and revise their goals, current system, opportunities for improvement, and barriers.
- Plan and conduct tests of the recommended changes detailed in the toolkit (i.e., PDSA cycles).
- After successful testing and adaptation, implement the changes in their facility.
- Attend and actively participate in the monthly huddles, Learning Sessions, and annual statewide meetings.
- Capture and submit the defined project data as required.
- Submit Leadership Reports that include documentation of PDSA cycles (i.e., changes being tested and/or implemented) and data (i.e., run charts).
- Strive to obtain significant improvement (evidenced in a team's data) by the end of the project. Specifically, to
  - Have all defined Structure Measures in place.
  - Achieve  $\geq 90\%$  performance on all defined Process Measures.
  - Improve the Outcome Measures to achieve the statewide project aim.

## How to Use This Toolkit

This toolkit focuses on providing the support and resources to achieve the project's aim. In addition to the rationale for improvement, this toolkit includes:

- An overview of QI.
- The details regarding the data measures that will be collected and monitored to see the impact of your changes and whether improvement has occurred.
- The recommended changes that your team can make that should result in improvement.

We recommend that you review the toolkit in whole. We then suggest focusing on the change ideas and potentially better practices listed in the Key Driver Diagram. It is recommended that all the change ideas and best practices be implemented by the end of the project.

Research your current system, including baseline data trends, and identify the opportunities for improvement. From this, we suggest creating a draft 30-60-90-day plan, which will help your team decide where to start and identify what you want to accomplish in the next 3 months. Thus, allowing your team to determine your first PDSA cycles.

As you conduct tests of change and accomplish individual change ideas, return to the Key Driver Diagram for your "roadmap" of which change idea to work on next.

This toolkit is intended for application in conjunction with the learning opportunities and webinars offered and facilitated by TIPQC.

The specific changes that will result in improvement and achieve the project aim will differ between participating facilities. The tools and concepts presented in this toolkit can and should be adapted to fit the unique circumstances, resources, and needs of each individual hospital.

Any success realized from this toolkit is in part due to the generosity and collaborative spirit of the team that developed this toolkit, the practices that participated in the TIPQC pilot projects, and from the Perinatal Quality Collaboratives who provided ideas and direction.



## QI Overview: *The Journey to Improvement*

All TIPQC inter-institutional QI projects are designed based on the IHI Model for Improvement (see Figure 9), which provides the framework for developing, testing, and implementing changes that lead to improvement. The following sections provide a more general overview of quality improvement – placed in the context of PVD at your facility.

### Phase 1: Define the Problem

#### Where are we now? And how did we get here?

It is important to understand your local data and to consider it in the context of regional, national, and international standards observing any changes over recent years. To achieve this, your team should understand how to look at your local data, what questions to ask and where to access applicable benchmarking data. The ability to convey these data to the wider team clearly and concisely will facilitate a stronger commitment to the implementation of QI interventions.

#### Questions to ask:

1. What proportion of deliveries at your facility are vaginal births (among NTSV population)?
2. What proportion of deliveries are cesarean (among NTSV population)?
3. What proportion of deliveries are cesarean after labor induction (among NTSV population)?
4. What proportion of these cesarean births are medically indicated (among NTSV population)?
5. What proportion of these cesarean births are avoidable (among NTSV population)?
6. What proportion of these cesarean births met the ACOG/SMFM Criteria (Ob Gyn 2014; 123:693–711)?
  - 6.1. Among NTSV women whose labor was induced (including cervical ripening) with a cesarean birth?
  - 6.2. Among NTSV women in labor with a cesarean birth for Dystocia or Failure to Progress?
  - 6.3. Among NTSV women who had a cesarean birth during labor for Fetal Heart Rate Concern?

#### Understanding barriers and enablers and finding solutions

In this section we describe some of the commonly described barriers and enablers to the promotion of safe vaginal delivery. This section will provide you with QI tools to integrate your own context and processes, giving examples to get the discussion within your team rolling. We suggest solutions that have worked elsewhere but encourage you to find solutions which are appropriate for your local setting as a solution which works for one team may not be successful in another.

In general, barriers fall into one of these categories:

1. Lack of awareness of the benefits:
  - Carry out a rolling program of education about safe vaginal delivery and its benefits: this may include face to face sessions, online tutorials, posters, safety briefs, and parent hand-outs.
  - Develop a shared guideline for the perinatal team.
  - Identify champions for the promotion of safe vaginal delivery for both obstetric providers, nursing, anesthesia teams.
2. Resistance to change:
  - Establish midwifery, obstetric, nursing, and anesthesia leads for the promotion of safe vaginal delivery and build a culture of shared responsibility.
  - Identify and empower champions for both obstetric providers and nursing maternity teams.
  - Encourage and share parental feedback about their experience of safe vaginal delivery.
  - Ask high performing units to share their improvement journey of the promotion of safe vaginal delivery.
  - Start small, one birth at a time, and build confidence.
  - Provide regular feedback, invite feedback, and address concerns of staff.
  - Invite this individual or group to join the project team and find ways of working with and not against them.
3. Concerns that vaginal delivery may harm the mother and/or baby:
  - Educate with the evidence that shows vaginal delivery is safe for both mother and baby.
  - Encourage maternity and anesthetic staff ‘call out’ during a vaginal delivery if concerns arise.
  - Make pre-birth huddles with obstetric team’s routine, where the plan is agreed upon, and planned actions rehearsed if challenges are encountered.
  - Ensure the team respects and maintains patient’s wishes for the vaginal delivery.

- Provide support for the perinatal staff and patient during vaginal delivery.
4. Logistical concerns and human factors in carrying out a vaginal delivery particularly under unsafe conditions:
- Develop a shared guideline for the perinatal team that walks people through the actions and tasks required.
  - Walk through the process and identify risk and logistical issues including human factors.
  - Conduct drills and simulation to improve confidence of staff.

Use some of these improvement tools to survey barriers and enablers in your own service:

1. **Force field analysis**- this tool balances the positive and negative drivers influencing safe vaginal delivery with scores assigned to describe the strength of each force. Study, plan, and act to strengthen the weaker positive forces and diminish the resisting forces (Figure 5). Resource: <https://tipqc.org/jit-force-field/>
2. **Pareto Chart**- in categorizing the underlying problem, a Pareto chart gives a visual depiction of the frequency of problems in graphical form, allowing you to target the areas that offer the greatest potential for improvement (Figure 6). Resource: <https://tipqc.org/jit-pareto-chart/>
3. **Fishbone diagram**- cause and effect analysis tool. This is a useful tool for categorizing factors which influence the ability to deliver safe care and vaginal delivery (Figures 7 & 8). Resource: <https://tipqc.org/jit-cause-effect/>
4. **Case review** – take the last 10-20 cases where a vaginal delivery was not achieved and use a structured review tool to identify any common themes. The ILPQC Toolkit has an example case review tool here: <https://ilpqc.org/initiatives/promoting-vaginal-birth-initiative/#> (the “Promoting Vaginal Birth Data Form”)
5. **Process mapping** – walk through the journey that a woman takes during labor and delivery and think about the factors within the process and the environment that may contribute to safe vaginal delivery. Resource: <https://tipqc.org/jit-flowcharts/>

Figure 5: Example force field analysis for Promotion of Vaginal Delivery (Tate, D, 2022)

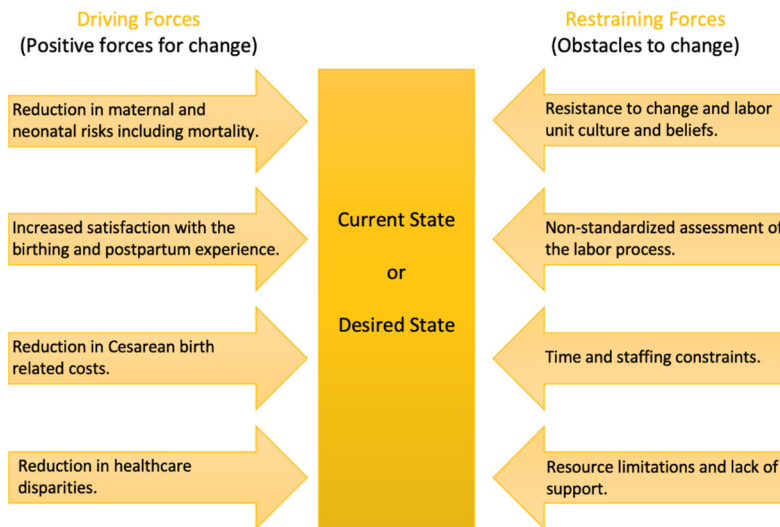
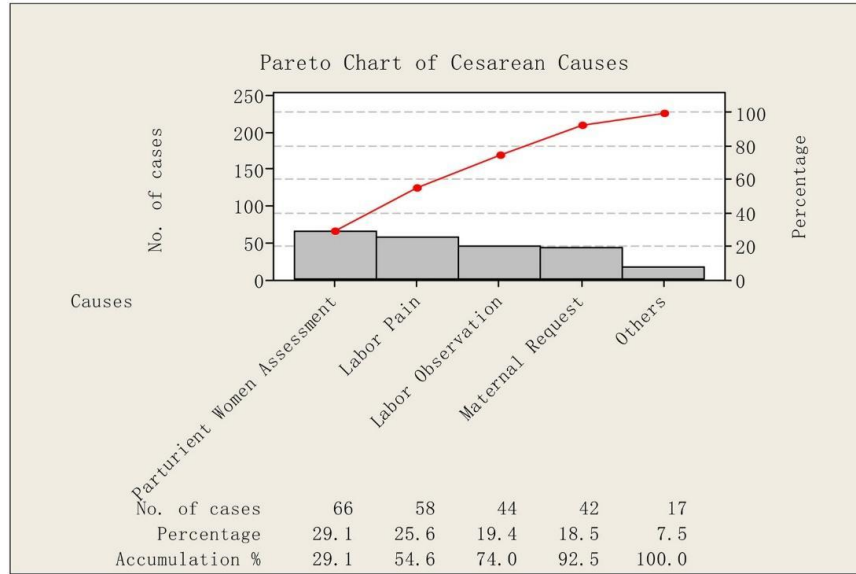
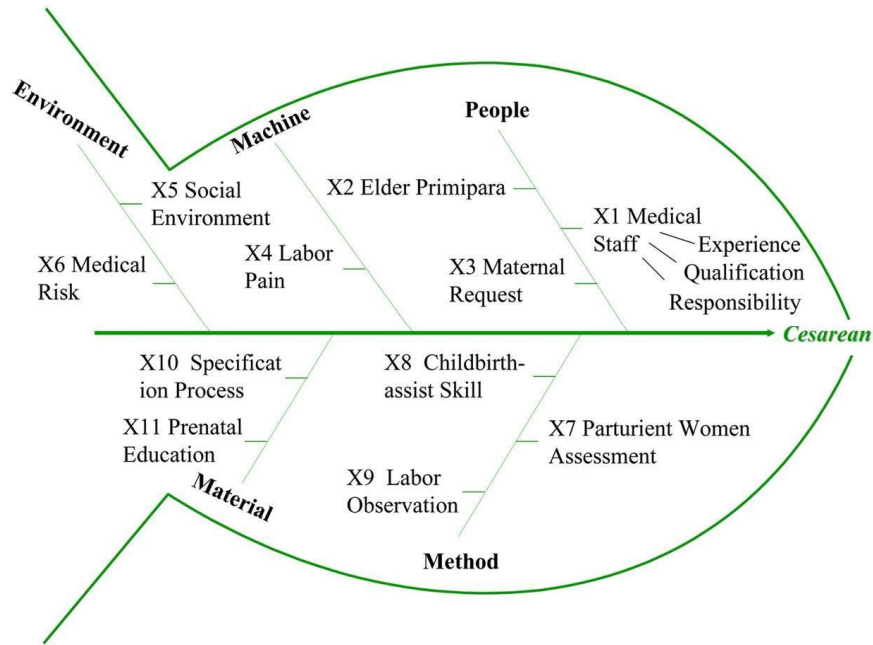


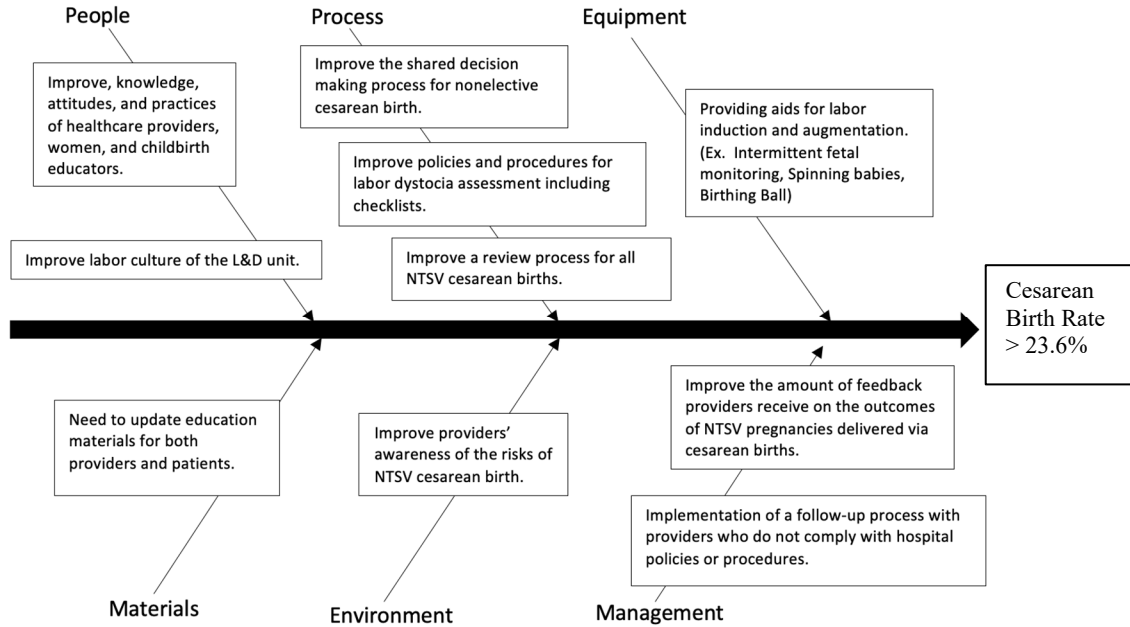
Figure 6: Example Pareto chart for Promotion of Vaginal Delivery (Chai, Z-Y et al 2017)[11]



Figures 7: Example fishbone diagrams for Promotion of Vaginal Delivery (Chai, Z-Y et al,2017) [11]



Figures 8: Example fishbone diagrams for Promotion of Vaginal Delivery (Tate, D,2022)



## Phase 2: Develop a Shared Purpose

### The evolution of the perinatal team

Obstetric and nursing teams all have an important role to play in the safe delivery of care for women in labor. This care at times may be delivered in professional silos which has the potential to lead to poor communication and missed opportunities for antenatal interventions which may lead to suboptimal outcomes. Developing a strong perinatal team within your workplace will help facilitate communication, understanding and collaboration across departments and allow more cohesive implementation and embedding of antenatal interventions. Having shared goals, a shared vision and sharing experience ensures your project has momentum and that barriers and enablers can be best appreciated and tackled.

One key component to any successful project is having a team that is engaged, resilient, enthusiastic, and committed to working together to create the right culture for change. Teams should ideally be around 5-8 members. Suggested team composition includes:

- Project champion
- Physician champion
- Nursing champion
- Unit medical director
- Unit nursing management
- Front line nursing
- Nursing educators
- Nurse practitioners
- Midwives
- Physicians
- Lived Experience: Patient/family members
- Patient safety officer
- Quality improvement office
- IT/EMR implementation experts
- Depending on the project – pharmacy, anesthesia providers, operating room leader, lactation, etc.

When forming your team consider:

- **Who** are the most influential people within the obstetric care team. These may not be the most senior staff members. Consider inviting those who are unsure or oppositional to understand perspective and secure buy in from the outset.
- **Where** are the areas likely to be affected by any changes? Consider staff in these areas.
- **Why** should people want to be involved in your project? Not everyone understands the benefits of PVD, so take the time to educate the staff. Consider how you are going to engage people and maintain their commitment.
- **What** is your expectation of team members? What will they be required to do in terms of time and effort? How will you manage team members who do not deliver on tasks/actions?
- **When** are people available and are the project's time commitments realistic?
- **How** often are you going to meet? Keep up momentum for change, short but frequent meetings.
- **What else** is going on? Are there existing work streams with overlapping agendas that could be pulled together to prevent duplication. Are there other QI projects which take priority?

Find out if your facility has a central quality QI team who can facilitate projects and provide valuable skills and knowledge in designing and implementing improvement work. Local data analysts are valuable in helping to collect, analyze, and display data.

#### Stakeholder engagement

Who else needs to be involved? Start by brainstorming the groups of people likely to be affected by the proposed change. Within the topic of safe vaginal delivery, they are likely to include:

- Obstetricians
- Obstetrical nurses
- Doulas
- Advance practice nurses – practitioners, midwives, CRNAs
- Lived Experience: parent groups
- Anesthesiologists

Resources: <https://tipqc.org/jit-teams/>

## Phase 3: Plan and Implement Changes

### Project Charter

The QI project charter provides a rationale for the team's work. It can help to clarify the team's thinking about what needs to be done and why. The charter helps the team keep the focus on a specific problem. The charter also identifies members of the project's team. An example charter and template can be found here:

<http://www.ihl.org/resources/Pages/Tools/QI-Project-Charter.aspx>

### Formulate, prioritize, and test solutions

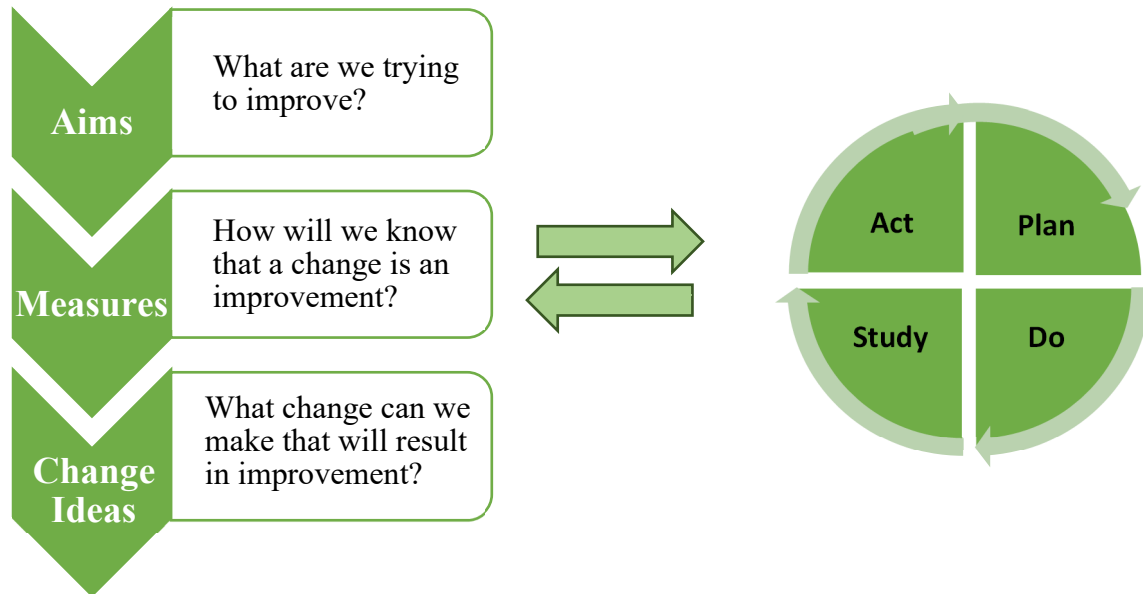
As mentioned, all TIPQC inter-institutional QI projects are designed based on the IHI Model for Improvement (Figure 9), which provides the framework for developing, testing, and implementing changes that lead to improvement.

### The Model for Improvement

The IHI Model for Improvement consists of the 3 questions and the Plan-Do-Study-Act (PDSA) cycle. With PDSA cycles, the main idea is a mindset of continuous monitoring and testing of change ideas over time.

- Plan** Which intervention(s) will you try first? This may be the intervention most likely to make an impact, the easiest to implement or the one that will best win hearts and minds. How will this intervention be introduced into clinical practice? Who and what will be required to make this happen? Predict what you think the change might be?

Figure 9: IHI Model for Improvement\*



For more information, see <https://tipqc.org/jit-pdsa/>.

\*Used by permission and adapted from: *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*[12]

- Do** When and how will this plan be carried out? A timescale is important. Document problems and unexpected observations.
- Study** Use established tools to analyze your data (see Phase 4). Has your change idea resulted in improvement? Is this a real improvement? Does your data suggest your change idea needs to be modified? Why might this be so? Compare your data to your predictions.
- Act** Identify and carry out any modifications needed to this change idea to make it more effective, using further PDSA cycles as needed i.e., Adapt, Adopt or Abandon, Repeat. Start with rapid testing your change on a small scale for example small numbers of patients or a specific subgroup of patients. If effective, increase the numbers or widen to include other groups of patients. Test and repeat with increasing scale until you can show effectiveness throughout your patient group.

Resources:

<https://tipqc.org/jit-model-for-improvement/>;  
<http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>

## Phase 4: Test and Measure Improvement

In this phase, improvements are tested, reviewed, and re-tested (using PDSA cycles) to find a solution.

### Measures

Measuring for improvement is different than the data collected for research or to prove whether clinical interventions work or not. This type of measurement asks the questions “how do we make it work in our context?” and “how do we know that a change is an improvement?” It is important that you collect the right data for your project.

Groups of measures collected include

- Outcome measures
- Process measures
- Balancing measures
- Structure Measures

The measures defined for this project are detailed in the “Measures: How will we know that a change is an improvement?” section.

### Data analysis and display

How will any change be measured, assessed, and displayed in your unit or network? Common tools to present and analyze your data include run charts and statistical process control (SPC) charts. All require a level of knowledge and skill to collate and interpret correctly. Importantly, measurement should not be a ‘before and after’ audit which is unreliable in measuring true change, but a continuous process over time during which your changes can be evaluated and modified.

Note that you may choose a different type of chart to be understood by your audience. Run charts and statistical process control charts should always be used by the QI project team in understanding data and assessing change, while other charts and tools may be used to prepare your data in a format which is best understood by frontline staff. You may need an easy-to-read key to explain your chart or provide a summary interpretation.

### Resources:

<http://www.ihl.org/resources/Pages/Measures/default.aspx>

<https://tipqc.org/jit-types-of-measures/>

<https://tipqc.org/jit-run-charts/>

<https://tipqc.org/jit-control-charts/>

<http://www.ihl.org/resources/Pages/Tools/RunChart.aspx>

<http://www.ihl.org/resources/Pages/Publications/TheRunChartASimpleAnalyticalToolforLearningfromVariationHealthcareProcesses.aspx>

## Phase 5: Implement, Embed, and Sustain

This phase involves the wider implementation of improvements so that change becomes embedded in routine practice throughout the system.

### Spread

This can involve formal methods such as *dissemination* that includes presentations, publications, leaflets, teaching boards, social media, or informal methods of *diffusion* where word of mouth, champions, and opinion leaders can accelerate your message. Consider carefully what is required for the embedding of changes within your system. It is also important to consider how to disseminate this information to non-participating centers. This could be done through local and regional conferences and at professional organization meetings.

### Exception reporting

We recommend that neonatal units undertake a case review when promotion of vaginal delivery is not achieved using the facility’s risk reporting mechanisms. A case review or audit tool can be used or adapted for this purpose. In this project since we are targeting every delivery, it might be helpful to review the deliveries from every shift or choose a priority gestational age cutoff.

### Sustainability

The ability of a service to implement and sustain change is dependent on various strengths and weaknesses of any one project. These can be assessed and addressed from the outset of a project and be reviewed regularly throughout the time course to improve the likelihood of sustaining improvement beyond its lifespan. A useful tool to guide sustainment efforts is available through the IHI at: <http://www.ihl.org/resources/Pages/Tools/HowtoGuideSustainabilitySpread.aspx>.

### Barriers and loss of motivation

It is not unusual to find the size of a previous improvement decreases over time. It is important to understand why, so that solutions can be tailored to the problem. Different approaches will be effective for different people and different situations. The following activities may be useful: talk to key individuals, observe clinical practice in action, use a

questionnaire to survey staff, and/or brainstorm with a focus group. Education is a key element of overcoming barriers particularly within an interactive forum; using opinion leaders to influence others within your staffing structure; reminder systems to prompt clinicians; and ensuring feedback of data to staff in a format that they find useful; and proper use of parent stories. All these can help to reinvigorate and embed your changes for improvement.

Resources:

<http://www.ihl.org/resources/Pages/IHIWhitePapers/AFrameworkforSpreadWhitePaper.aspx>

<http://www.ihl.org/resources/Pages/Tools/Sustainability-Planning-Worksheet.aspx>

<https://tipqc.org/jit-spread/>

<https://tipqc.org/jit-holding-gains/>



## Measures: How will we know that a change is an improvement?

The following outlines the target population and the Outcome, Balancing, Process, and Structure Measures for this QI project. More specific data definitions and what data elements will need to be extracted from your EMR are provided in the project *"EMR Data Guide"*.

### Target population

Nulliparous birthing patients with a term, singleton baby in a vertex presentation.

- Nulliparous = first delivery/birth or Para Zero
- Term =  $\geq 37$  weeks gestation,
- Singleton = no twins or beyond,
- Vertex position = Cephalic position; no breech or transverse positions.

This population is also known as the NTSV population.

### Outcome measures

*Frequency of collection & reporting:* monthly

#### #1. Cesarean delivery rate among NTSV population

- Denominator = women with live births who are having their first birth  $\geq 37$  weeks gestation and have a singleton in vertex (Cephalic) position
- Numerator = among the denominator, all cases who had a cesarean birth

#### #2. Cesarean delivery rate among NTSV population after labor induction

- Denominator = women with live births who are having their first birth  $\geq 37$  weeks gestation and have a singleton in vertex (Cephalic) position and with a labor induction
- Numerator = among the denominator, all cases who had a cesarean birth

#### Potential disparities across Structural & Social Determinants of Health (SSDOH):

- Participating hospitals will be asked to capture the "overall" numerator and denominator counts for each outcome measure as well as counts disaggregated by (1) mother's race/ethnicity and (2) payor type.

### Balancing measures

*Frequency of collection & reporting:* monthly

#### #1. Percent of 5-minute APGAR scores $\leq 5$ among NTSV vaginal births

- Denominator = women with live births who are having their first birth  $\geq 37$  weeks gestation and have a singleton in vertex (Cephalic) position
- Numerator = among the denominator, number of vaginal births with 5-minute APGAR score  $\leq 5$

#### #2 Percent maternal complications among NTSV vaginal births

- Denominator = women with live births who are having their first birth  $\geq 37$  weeks gestation and have a singleton in vertex (Cephalic) position
- Numerator = among the denominator, number of vaginal births any of the following complications
  - Chorioamnionitis
  - Postpartum Hemorrhage (over 1,000 mL EBL/QBL) with or without blood transfusion

**IMPORTANT:** In the summer of 2023, AIM announced they would be releasing a revised version of their ‘Safe Reduction of Primary Cesarean Birth’ Safety Bundle, which was used as a foundation for the TIPQC PVD project. These revisions included changes to the Process & Structure Measures to be collected. AIM announced they would transition to the revised Process & Structure Measures starting with Q4 2023 reporting.

## Process measures

Frequency of collection & reporting: quarterly

<b>PREVIOUS TO BE DISCONTINUED AFTER Q3 2023</b>	<b>REVISED TO BE ADDED AS OF Q4 2023</b>
<p><b>1. Provider education:</b> Cumulative proportion of <u>OB physicians and midwives</u> have completed (within the last 2 years) an education program on the ACOG/SMFM labor management guidelines that includes teaching on the ‘Safe Reduction of Primary Cesarean Birth’ bundle and the unit-standard protocol?</p>	<p><b>1A. Provider education on safe support of labor and vaginal births:</b> Cumulative proportion of <u>OB physicians and midwives</u> has completed within the last 2 years an education program on <b>safe support of labor and vaginal births</b>?</p> <p><b>1B. Provider education on respectful and equitable care:</b> Cumulative proportion of <u>OB physicians and midwives</u> has completed within the last 2 years an education program on <b>respectful and equitable care</b>?</p>
<p><b>2. Nursing education:</b> Cumulative proportion of <u>OB nurses</u> have completed (within the last 2 years) an education program on the ACOG/SMFM labor management guidelines that includes teaching on the ‘Safe Reduction of Primary Cesarean Birth’ bundle and the unit-standard protocol?</p>	<p><b>2A. Nursing education on safe support of labor and vaginal births:</b> Cumulative proportion of <u>OB nursing staff (including L&amp;D and postpartum)</u> has completed within the last 2 years an education program on <b>safe support of labor and vaginal births</b>?</p> <p><b>2B. Nursing education on respectful and equitable care:</b> Cumulative proportion of <u>OB nursing staff (including L&amp;D and postpartum)</u> has completed within the last 2 years an education program on <b>respectful and equitable care</b>?</p>

## Structure measures

Participating hospitals to report the date each structure measure has been completed.

<b>CURRENT TO BE DISCONTINUED AFTER Q3 2023</b>	<b>REVISED TO BE ADDED AS OF Q4 2023</b>
<p><b>1A. Patient, family, &amp; staff support:</b> <i>Has your hospital developed OB specific resources and protocols to support patients, and family through an unexpected / traumatic Cesarean birth?</i></p> <p><b>1B.</b> <i>Has your hospital introduced Principles of shared decision making?</i></p>	<p><b>1A. Patient and Support Network Review of Cesarean Birth:</b> <i>Has your department established a standard process to review with patients and their support network on why they had a Cesarean birth?</i></p> <p><b>1B. Patient and Support Network Support After an Unexpected or Traumatic Cesarean Birth:</b> <i>Has your hospital developed OB-specific resources and protocols to support patients and their support network through an unexpected or traumatic Cesarean birth?*</i></p> <p><i>*An unexpected or traumatic Cesarean birth may differ for patients and their support networks but may include crash or emergency Cesarean births.</i></p>

<p><b>2. Policy &amp; Procedure:</b> <i>Does your hospital have an up-to-date new labor guidelines policy and procedure (reviewed and updated in the last 2-3 years) that provides a unit-standard approach for providing labor support, freedom of movement, and management protocols for labor challenges?</i></p>	<p><b>2A. Unit Policy and Procedure:</b> <i>Does your hospital have an up-to-date labor guidelines, policies, and procedures (reviewed and updated in the last 2 years) that provide a unit-standard approach for providing labor support, freedom of movement, and addressing labor challenges?</i></p> <p><b>2B. Unit Policies and Procedures for Prioritizing Scheduled Inductions of Labor:</b> <i>Does your hospital have a prioritization policy, rubric and/or procedure for determining priority of scheduled inductions of labor and Cesarean births?</i></p>
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<p style="text-align: center;"><b><i>CURRENT TO BE DISCONTINUED AFTER Q3 2023</i></b></p> <p><b>3. EMR Integration:</b> <i>Were any of the recommended tools for the ‘Safe Reduction of Primary Cesarean Birth’ bundle (i.e., order sets, protocols, and/or documentation) integrated into your hospital’s Electronic Medical Record (EMR) system?</i></p>	<p style="text-align: center;"><b><i>NEW TO BE ADDED AS OF Q4 2023</i></b></p> <p><b>3. Labor Management Huddles:</b> <i>Has your department established huddles for communicating progression and support of labor that are inclusive of patients, their support networks, and the clinical team?</i></p>
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<p style="text-align: center;"><b><i>CURRENT TO BE RETAINED AS IS</i></b></p> <p><b>4. Multidisciplinary case reviews:</b> <i>Has your hospital established a process to perform multidisciplinary bundle reviews on a random sample of 10-20 charts/monthly (depending on hospital size) for NTSV C/S?</i></p>
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## Change Ideas: *What changes can we make that will result in an improvement?*

All improvement requires change. And while there are many kinds of changes that will lead to improvement, the specific changes are developed from a limited number of *change concepts*. As described in the IHI Model for Improvement, “A change concept is a general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement.” These change concepts are used to design and run tests of change (i.e., Plan-Do-Study-Act (PDSA) cycles) to see if they result in improvement.

A similar idea to change concepts are *Potentially Better Practices* (PBP’s), which are a set of clinical practices that have the potential to improve the outcomes of care. They are labeled ‘potentially better’ rather than ‘better’ or ‘best’ because until the practices are evaluated, customized, and tested in your own institution, you will not know whether the practices are truly ‘better’ or ‘best’ (or ‘worse’). Depending on the circumstances in your facility, you may have to implement other practices or modify existing ones to successfully improve outcomes. The PBP’s in this collection are not necessarily the only ones required to achieve the improved outcomes targeted. Thus, this list of PBP’s is not exhaustive, exclusive, or all inclusive. Changes in practice, guided by these PBPs, will require testing and adaptation to your circumstances and context to achieve measured improvements in outcomes.

The following change concepts / PBPs provide have been organized under the *primary (key) drivers* – factors which contribute directly to achieving the aim.

### 1. Improve the Culture of Care, Awareness, & Education - *READINESS*

Generating meaningful change requires buy-in from all parties involved- hospital administrators, patients and their families, outpatient clinic staff, as well as labor and delivery providers. Before implementing changes, it’s crucial to assess the existing environment at your institution to assess the readiness for change and areas for greatest opportunity.

Tennessee hospitals can evaluate the needs and potential challenges at each institution through use of the Labor Culture Survey, developed by VanGompel. This will allow each unit to develop more awareness and individualize an approach to implementing the recommended practices.

#### **Create a culture on obstetric units that supports safe vaginal delivery**

- Promote comfort and progress in labor
  - Freedom of movement and choice in birth position
  - Intermittent auscultation, in low-risk pregnancies
  - Unit support of non-pharmacological methods for coping with labor pain
  - Care that promotes a woman’s comfort, dignity, and privacy
  - Respect for each woman’s cultural needs
- Develop and implement evidence-based policies, guidelines, and practices, including
  - Appropriate induction of labor scheduling and admission criteria
    - Bishop Score Criteria
    - ARRIVE Trial
  - Failed induction criteria
  - Labor dystocia checklist- (Consider including CMQCC Labor Dystocia Checklist (ACOG/SMFM Criteria)) – see Figure 10 for illustration
  - Latent and active stage of labor management/labor dystocia criteria
  - Second stage of labor management/arrest criteria
- Utilize care team huddles/debriefs to identify and review delivery decisions for consistency with process flows/protocols/checklists (e.g., when declaring failed inductions or arrest of labor as the indication for cesarean birth, in non-emergent situations)
- Implement a workflow process for shared decision making (e.g., decision huddle with provider, nurse, and patient to review treatment options, risk/benefits, and ACOG/SMFM guidelines)

Figure 10: Example of Labor Dystocia Checklist

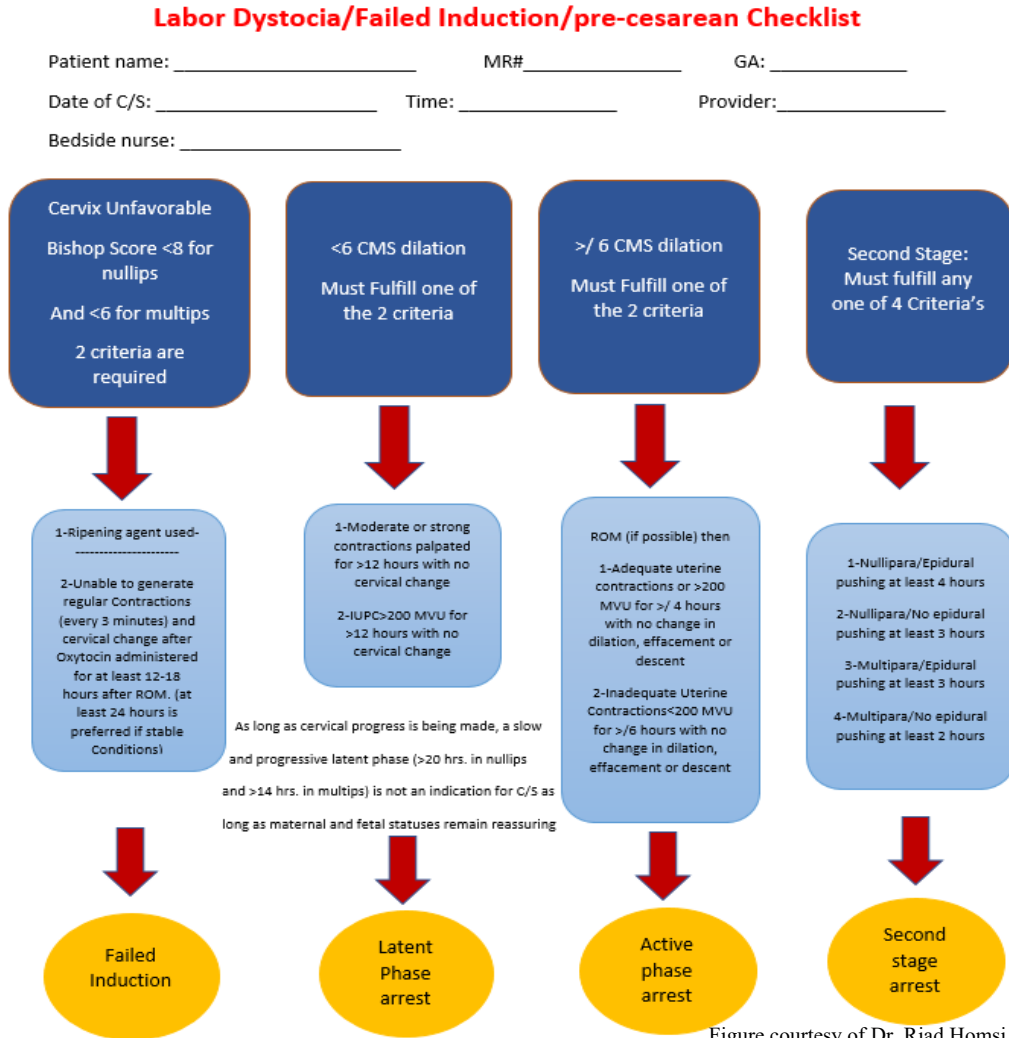


Figure courtesy of Dr. Riad Homs,2022

*\*\*This checklist is not intended to replace clinical judgment yet represents an example of an aid to clinical decision making. Health-care teams are advised to create checklists that will be most beneficial to treating their patient population.\*\**

**Educate providers, nursing, and staff on evidence-based practices and protocols**

- Educating for labor providers should include
  - Benefits of movement in labor
  - Communication tools for promoting patient engagement
  - Training in identifying and managing malposition
- Recommendations for education for nursing:
  - Spinning Babies course
  - Identifying fetal position and options for intervention
  - Communication with providers when Pitocin is discontinued in IOLs/AOLs
  - Refresher classes on EFM and management for each category
- Recommendations for educating both groups:
  - Essential elements of effective communication and shared decision making

**Improve the quality of and access to childbirth education for patients**

- Patients should receive information about the promotion of safe vaginal delivery during prenatal care visits, along with information on the indications for Cesarean delivery
  - During PVD, patients should be given reassurance regarding safety including their baby's well-being

- Utilize shared decision-making practices through use of evidence-based decision aids formats specific to language and literacy levels
- Provide patient information on how we work to promote safe vaginal delivery
  - Consider creating video with education
  - Consider incorporating educational aids in the EMR for ease of access by providers and staff

### **Improve support from hospital administration and leadership and use of clinical champions**

- Utilize the power and influence of hospital leadership at all levels to promote an environment of continuous quality improvement in the reduction of NTSV cesarean births.
- Create and support a group of passionate, interprofessional clinical champions whose goal is to collectively keep momentum and focus on the quality initiatives.

Resources:

<https://www.birthtools.org/Unit-Culture>

<https://www.cmqcc.org/VBirthToolkit>

## **2. Support Intended Vaginal Birth – *RECOGNITION & PREVENTION***

### **Implement institutional policies that uphold best practices in Obstetrics, safely reduce routine interventions in low-risk women, and consistently support vaginal delivery**

- Perform a comprehensive review of existing unit policies and edit such policies to provide a consistent focus on evidence-based support of vaginal birth
- Create new evidence-based unit policies focused on supporting vaginal birth

### **Implement early labor supportive care policies and establish criteria for active labor admission**

- Implement policies that support the natural onset of active labor, reduce stress and anxiety for the patient and support persons, and improve coping and pain management
- Implement written policies that establish criteria for active labor admission, versus continued observation of labor status and/or discharge home
- Give adequate anticipatory guidance during the prenatal period about early labor expectations and the safety of completing early labor at home
- Educate patients and support persons on supportive care practices and comfort measures to enable early labor completion at home

### **Improve the support infrastructure and supportive care during labor**

- Improve provider and nursing knowledge and skill in supportive care techniques that promote comfort and coping during labor
- Improve structured assessment of pain and coping
- Remove staffing and documentation barriers to supportive beside care
- Educate and empower support persons to provide supportive care
- Implement intermittent monitoring policies for low-risk patients
  - Implement checklists with inclusion and exclusion criteria to assist in identifying patients appropriate for intermittent electronic fetal monitoring (EFM)
  - Modify standing admission orders to include use of intermittent EFM as an option for mode of monitoring for patient's meeting criteria
  - Implement and provide ongoing training and education for all nurses and providers on intermittent EFM procedures
  - Educate patient on the use of intermittent monitoring methods and engage in shared decision making in order to determine the most appropriate method for each patient
  - Ensure appropriate staffing to accommodate intermittent monitoring
- Utilize best practices for laboring patients with regional anesthesia (epidural, spinal, and combined spinal epidural)

- Do not avoid or delay placement of regional anesthesia as a means of reducing cesarean birth risk.
  - There is no arbitrary cervical dilation goal for administration of regional anesthesia.
- The patient should be assisted in changing position at least every 20 minutes to aid in necessary fetal rotation.
- Allow for longer duration of second stage of labor as long as maternal and fetal statuses are reassuring.

**Implement current evidence-based treatment and prevention guidelines for potentially modifiable conditions**

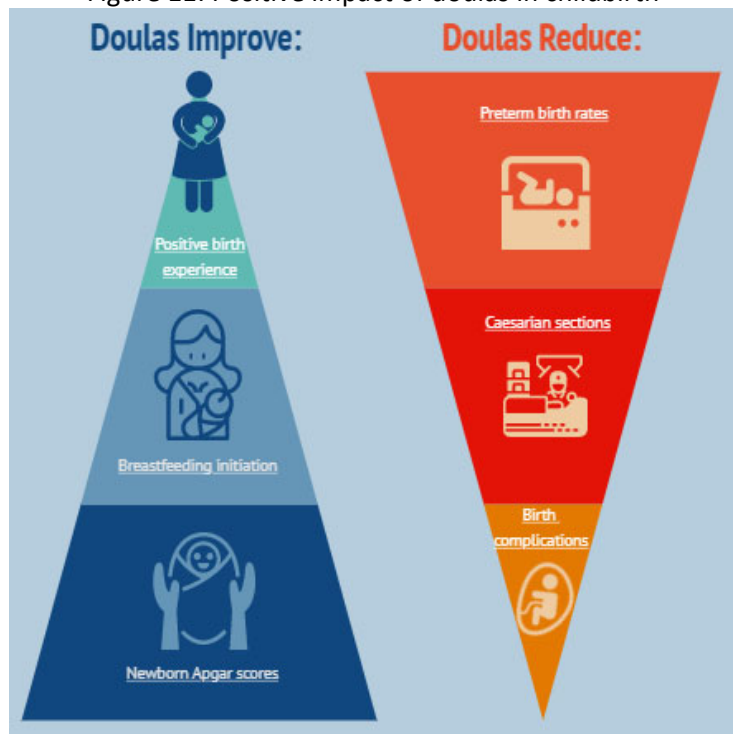
- Assess fetal presentation in the late preterm period and offer external cephalic version (ECV) to patients meeting criteria.
  - Ensure initial and ongoing physician competency in ECV
- Offer oral suppressive therapy starting at 36 weeks to all women with a history of genital herpes, including those with no history of active outbreak during the current pregnancy
  - A cesarean delivery does not need to be performed on women with a history of genital herpes but no active genital lesions at the time of delivery.

**(OPTIONAL) Consider the use of community based Non-traditional workforce (NTW)**

**Rationale:** A NTW provides emotional support to mothers before, during, and after childbirth. [13, 14] This role of a doula entails nurturing mothers' emotional, mental, and physical well-being while serving, advocating, and elevating the client's voice.[15-17] The presence of doula support is associated with lower C-section rates, higher patient satisfaction, and increased breastfeeding rates.[18, 19] Various health organizations such as the American College of Obstetrics and Gynecology and the World Health organization have encouraged the implementation of community birth attendants such as doulas in North American and African countries to improve birthing people's birthing outcomes, particularly in medically remote areas.[20-22]

Furthermore, Black, and publicly insured pregnant people desire doulas & other NTW but are less likely to have access to them. As a result, black birthing people are three to four times more likely to die due to pregnancy-related complications than White birthing people.[23] These statistics, coupled with historical and systemic racism, have led to mistrust in the medical establishment. [24]As a result, Black women turn towards NTW for increased support and advocacy.[25, 26] In response to the Black maternal mortality crisis, there is a growing need to recreate a "village" model, and community doulas are at heart. Figure 11 describes the positive impact of doulas in childbirth (Reference: [Four State Strategies to Employ Doulas to Improve Maternal Health and Birth Outcomes in Medicaid - The National Academy for State Health Policy \(nashp.org\)](#)).[27]

Figure 11: Positive impact of doulas in childbirth

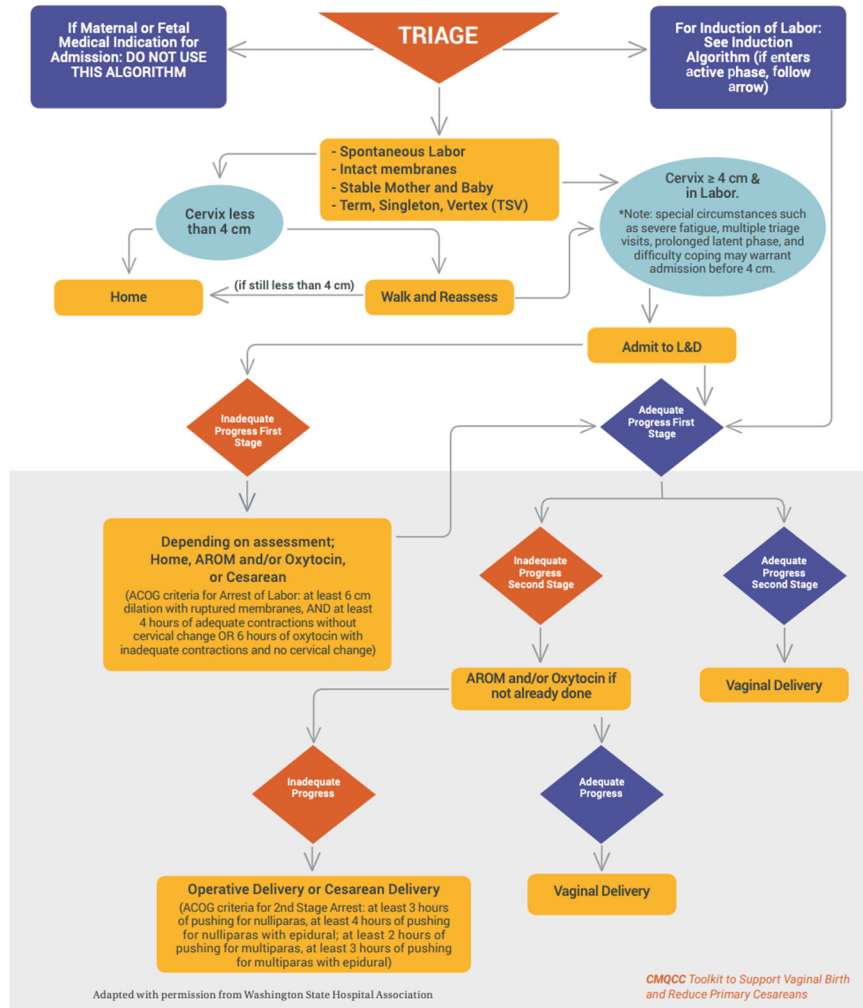




**Implementation strategies for local QI teams:**

<b>Readiness</b>	<ul style="list-style-type: none"> <li>● Host listening sessions for NTW about how they envision hospital integration. Understand your current hospital regulations, training &amp; requirements for doulas.</li> <li>● Develop a hospital policy for doulas</li> <li>● Develop a hospital scope of work for doulas</li> <li>● Have a doula join your QI team</li> <li>● Education of hospital stakeholders about the positive benefits of doulas (meet &amp; greet, hospital grand rounds or staff meetings).</li> <li>● Brochure documenting benefits of doulas for distribution to participating hospitals</li> </ul>
<b>Recognition &amp; Prevention</b>	<ul style="list-style-type: none"> <li>● Implement standardized best practices</li> <li>● Participate in TIPQC QI Training Opportunities</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>● Create a doula registry for your hospital</li> <li>● Create a verification process for doulas</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>● Track all births supported by doulas and the mode of delivery compared to births not supported by doulas</li> </ul>
<b>Potential challenges</b>	<ul style="list-style-type: none"> <li>● Limited or no insurance coverage for community-based doulas</li> <li>● Limited knowledge by hospital stakeholders (nurses, doctors, and hospital administrators) of the benefits of doulas</li> <li>● Limited knowledge on how to operationalize doulas on labor and delivery</li> <li>● Hospital policy limits the number of support people for birthing persons</li> </ul>

Figure 11: Example of a Spontaneous Labor Algorithm[28]





### 3. Manage Labor Abnormalities – *RESPONSE*[29-32]

#### **Implement standard diagnostic criteria and standard responses to labor challenges and fetal heart rate abnormalities**

- Utilize standard diagnostic criteria and algorithms to reduce and respond to labor dystocia
- Endorse NICHD categories and standardize responses to abnormal fetal heart rate patterns and uterine activity
- Standardize induction of labor including selection criteria and the induction process

#### **Create highly reliable teams and improve interprofessional communication at critical points of care**

- Develop protocols and policies that promote and support teamwork and effective communication
- Create a culture of collegiality and mutual respect
- Implement formal programs for the development and ongoing evaluation of teamwork and communication
- Promote standardized communication techniques to improve efficiency and clarity of communication
- Promote situational awareness through impromptu huddles, team rounds, and debriefings
- Develop relationships with out of hospital providers in order to increase collaborative communication and facilitate safe and respectful transfer of care

#### **Identify malposition and implement appropriate interventions**

- Identify malposition early and employ the use of ultrasound if unable to clearly define the position of the fetal head with digital exam and Leopold's maneuvers
- Promote rotation of the vertex from an occiput posterior (OP) position with maternal positioning and manual or instrumented rotation by experienced provider
- As long as there is progressive descent of the fetal head occurring and both fetal and maternal statuses are reassuring, allow for longer duration of the second stage

#### **Utilize alternative standards of labor care**

- Laborist models of care promote on site readiness, remove the time-based and economic incentives to perform cesarean deliveries, and lend to the retention of core knowledge and skills
- Midwifery care has been identified as an underused maternity service, with the potential to curb costs, improve overall outcomes, and reduce rates of caesarean delivery
- Ensure initial and ongoing physician competency in forceps and vacuum-assisted vaginal delivery

### 4. Use Data to Drive Improvement – *REPORTING*

In general, the core tenets for using data to drive improvement are

1. Create awareness
2. Promote transparency
3. Improve data quality
4. Create actionable data
5. Reduce data burden
6. Design new measures to drive QI

The specific change concepts for this QI project are:

- Track and report labor and cesarean measures in sufficient detail to assess and compare performance – both at the institution and provider level
- Track and report labor and cesarean measures in sufficient detail to conduct case reviews and systems analysis
- Track appropriate metrics and balancing measures that assess maternal and newborn outcomes resulting from changes in labor management strategies to ensure safety

Other recommendations:

- Create meaningful sub-measures that indicate the drivers for the cesarean rate and benchmark these against other facilities

- Present identical measures across multiple levels – MD / practice group / hospital / medical group / health plan / purchaser /region / state
- For internal hospital use, create provider level rates to help utilize “peer pressure” and identify those who would benefit from specific educational programs including reviews of their processes of care
  - Help providers understand where improvement opportunities lie
- Present comparative data in a manner that demonstrates a sense of urgency
- Provide timely data to providers in a persuasive manner using display tools, background information, benchmarks, historical data, and broader outcome data (such as infant outcomes and maternal morbidity measures)
- When presenting the data, include a goal that is attainable/achievable by showing that similar providers have already reached the goal
- Use rapid-cycle data (30-75 days old) to provide immediate feedback for QI projects including multiple peer comparisons

## 5. Prioritize Respectful, Equitable, & Supportive Patient Care – *INCLUSION & EQUITY*

### Recommendations:

- Include each patient that experienced a cesarean delivery as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs
  - Make sure to include each patient’s identified support network
  - Key points
    - Establishment of trust
    - Informed, bidirectional shared decision-making
    - Patient values and goals as the primary driver of this process
- Engage in open, transparent, and empathetic communication with pregnant and postpartum people to understand diagnoses, options, and treatment plans
  - Make sure to include each patient’s identified support network
- Protect patient autonomy to enable the patient’s personal choice with a focus on family-centered care
- Obtain informed consent through shared decision making at major decision points of care
- Promote equal opportunity to all NTSV persons with no contraindications to vaginal delivery

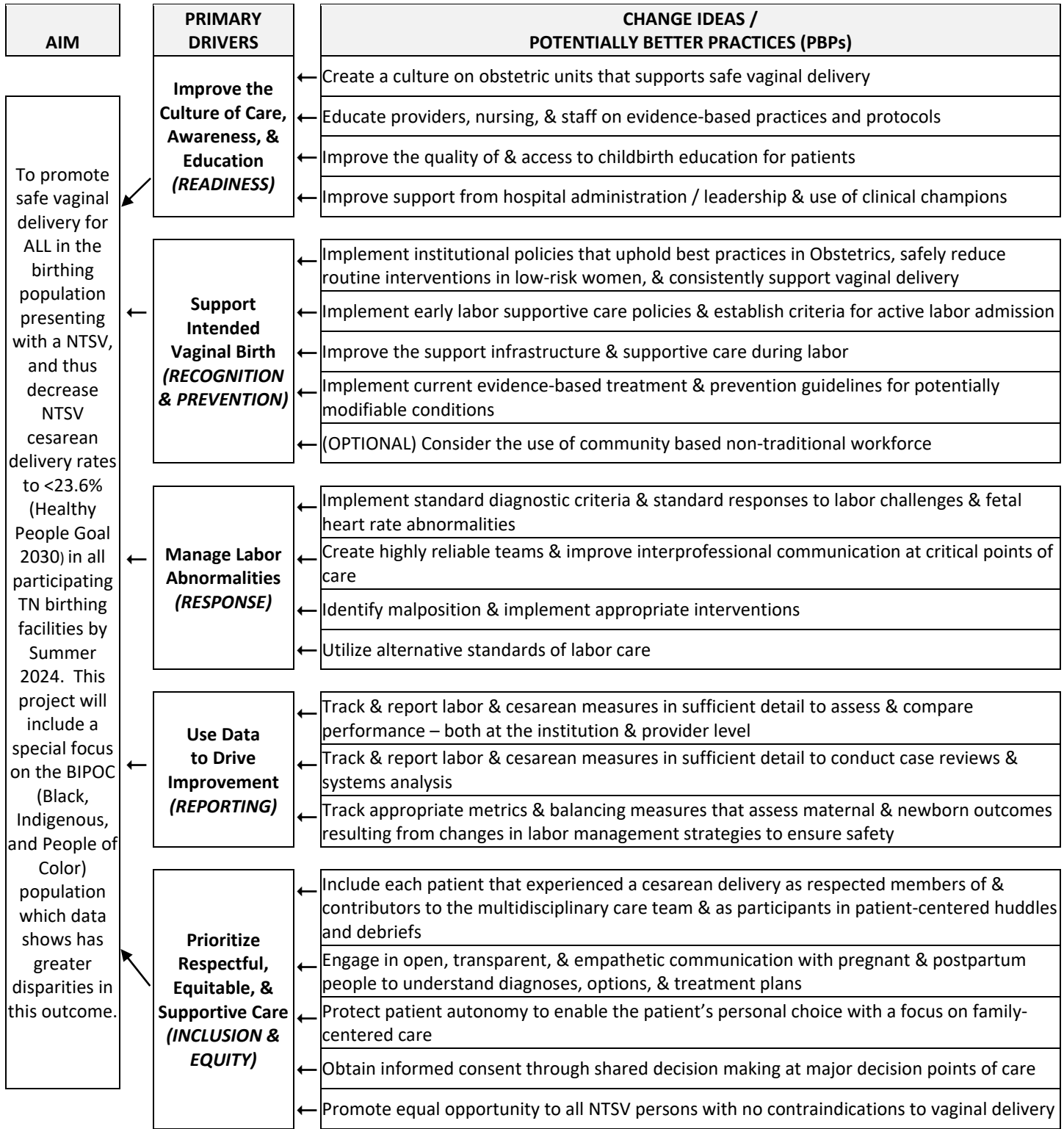
### Implementation resources:

- Achieving Health Equity: A Guide for Health Care Organizations; IHI, 2016 (<http://www.ihl.org/resources/Pages/IHIWhitePapers/Achieving-Health-Equity.aspx>)
- Black Women Disproportionately Suffer Complications of Pregnancy and Childbirth. Let’s Talk About It; ProPublica, 2017 (<https://www.propublica.org/article/black-women-disproportionately-suffer-complications-of-pregnancy-and-childbirth-lets-talk-about-it>)
- Reduction of Peripartum Racial and Ethnic Disparities: A Conceptual Framework and Maternal Safety Consensus Bundle
  - JOGNN, 2018 ([https://www.jognn.org/article/S0884-2175\(18\)30064-9/fulltext](https://www.jognn.org/article/S0884-2175(18)30064-9/fulltext))

## Key Driver Diagram

A key driver diagram is a visual display of a QI collaborative (or team’s) theory of what “drives,” or contributes to, the achievement of the project aim – that is, the project’s “theory of change.” The far-right column lists the specific *change ideas to test* using PDSA cycles.

Promotion of Safe Vaginal Delivery
Key Driver Diagram

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