Stage-based implementation of immediate postpartum long-acting reversible contraception using a reproductive justice framework

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The immediate postpartum period is a favorable, safe, and effective time to provide long-acting reversible contraceptives, yet it is not available widely. We describe an innovative hospital-based approach to immediate postpartum long-acting reversible contraceptives that includes (1) an emphasis on multidisciplinary teambuilding and identification of champions, (2) a focus on the use of implementation science at every stage of the process to develop a systematic and replicable strategy, and (3) an imperative to apply a reproductive justice framework to immediate postpartum long-acting reversible contraceptive implementation. Our model was developed with the use of implementation science best practices. Implementation teams comprised of diverse stakeholders were formed and included champions to promote progress. Our team assessed the implementation context for immediate postpartum long-acting reversible contraceptives and used the findings to develop a readiness assessment for hospitals. A stage-based implementation checklist was then developed to outline necessary infrastructure to support an immediate postpartum long-acting reversible contraceptive initiative. A reproductive justice lens guided planning and implementation. The 3 innovative aspects of our implementation process resulted in a systematic, multidisciplinary, and culturally appropriate model for immediate postpartum long-acting reversible contraceptives that can be replicated across hospitals. Implementation teams and champions moved the work forward at each hospital, and 3 of the 5 participating hospitals moved beyond the exploration stage of implementation during the engagement. Patient education materials and provider training incorporated person-centered and reproductive justice frameworks. Our hope is to continue to partner with stakeholders to better understand how our efforts to support hospital provision of immediate postpartum long-acting reversible contraceptives can increase reproductive health equity rather than perpetuate disparity.

Key words: contraception, immediate postpartum long-acting reversible contraception, implementation science, reproductive justice, stage-based implementation

An increasing proportion of women in the United States choose long-acting reversible contraception (LARC) as a contraceptive method, which is up from 2% in 2002 to 14% in 2014.[1–3] LARC is reversible birth control that provides pregnancy prevention for 3–10 years, depending on the method. LARC, which includes intrauterine devices (IUDs) and implants, is highly reliable and up to 20 times more effective than moderately effectively birth control methods.[4] The immediate postpartum period (IPP) is identified as an important time for contraceptive decision-making; it can be a particularly favorable, as well as safe and effective, time to provide LARC methods; one-half of women in the postpartum period report having unprotected intercourse before the routine 6-week postpartum visit.[5] IPP LARC insertion is a clinical procedure that can be provided concurrent with mother-baby care related to delivery and is a cost-saving, highly effective strategy for decreasing the risk of unintended pregnancies. Although the risk of expulsion or malposition is higher in the IPP setting, this is still a preferred approach for some patients.[6] Despite the benefits of providing access to IPP LARC, sustainable and equitable implementation within a hospital has often proved challenging, limiting patient access and reproductive autonomy.

Hospitals that want to incorporate IPP LARC as part of their obstetrics care must develop new internal systems to ensure efficient, sustainable, and equitable access for patients. For example, pharmacy must make devices easily accessible on obstetrics units; physicians and nurses must be trained in provision of care; electronic health records must be updated to support documentation and charging processes; billing and coding

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workflows must be developed to monitor and track reimbursement; and patient education and counseling materials must be available. Coordination and collaboration across multiple departments that is necessary to support such changes is often challenging.

Although robust evidence demonstrates the efficacy and effectiveness of IPP LARC, proven treatments often fail to be implemented and sustained in usual care.[7] This is, in part, due to the complexity of coordination of multiple departments and alignment of isolated systems, while clinical providers' skills are being developed. The field of implementation science is dedicated to the identification and study strategies that are used to improve the uptake, execution, and sustainability of interventions and can be used to facilitate implementation and sustainment of IPP LARC.[8] Implementation strategies include provider training, the development of policies and procedures to ensure standardization, and the creation of job aids such as checklists.[9] When used alone or in combination, implementation strategies are essential for increasing the likelihood that interventions will produce desired outcomes successfully.

We describe a hospital-based approach to IPP LARC provision using a multidisciplinary, team-based, implementation science—informed approach. Innovative to our model is an emphasis on multidisciplinary team building and the identification of champions, a focus on implementation science at every stage of the process to develop a systematic and replicable strategy, and an awareness of the importance of the historic and cultural contexts of women's fertility that created an imperative to apply a reproductive justice framework.

North Carolina's 2016 Perinatal Health Strategic Plan recommends supporting healthy pregnancy intervals through access to effective methods of contraception, which includes increased access to LARC. [10] Implementing LARC in the North Carolina context is one that requires technical support and raises issues of reproductive justice, which refers to the right to maintain individual bodily autonomy and to have or not have children that can be parented in safe and sustainable communities.[11] Between 1929 and 1974, >7000 men and women in North Carolina were subjected to forced sterilization. This state-led eugenics effort was biased racially and targeted marginalized individuals who were deemed to be unfit: approximately 65% of the women who were sterilized in North Carolina were black.[12,13] Any LARC implementation effort in North Carolina must be carried out with great intention to ensure reproductive justice is at the forefront of the program design and delivery.

Methods

Our project identified the need to support hospitals in changing and aligning their internal systems to support implementation of IPP LARC with sustainable infrastructure. We accomplished this through applying implementation science strategies to facilitate hospitals' use of implementation teams, a staged process, and a reproductive justice lens.

Team and champion development

Kroelinger et al[14] identified leveraging stakeholder partnerships as a critical approach for implementation efforts that aim to increase access to IPP LARC. Implementation teams are groups of stakeholders that are responsible for overseeing an implementation effort and conducting ongoing improvements. They provide a platform to support implementation efforts and are a common best practice across implementation frameworks.[15] Team members should be diverse in experience and represent a variety of perspectives across all organizational levels of an impacted system. Inclusion of patient and family advisors can help provide insight and guidance on how to promote patient satisfaction, access to services, and protect patient reproductive rights. Multidisciplinary teams have a greater likelihood of sustaining evidence-based interventions; without teams, implementation efforts rely on individual leaders and fail to build stakeholder buy-in or account for diverse perspectives.[16] When used effectively, implementation teams can identify and resolve infrastructure gaps, use data for decision-making and improvement, and link policy with practice within and across systems.[15]

To ensure effective implementation in this project, 2 implementation teams were developed. First, a core implementation team was formed to lead the overall project. This team designed, executed, and monitored the implementation strategies of participating hospitals. Core team members approached all implementation stages with attention to patient equity to maintain a reproductive justice framework throughout the process. Second, participating hospitals developed internal implementation teams to oversee IPP LARC delivery. These teams were built with support from the Perinatal Neonatal Outreach Coordinator, who served as a liaison between the teams. Each facility was encouraged to have representatives from obstetrics, pharmacy, nursing, nursing education, lactation, information technology, patient advisors, billing and coding, and finance. Hospitals were also encouraged to have a team lead person and champion to oversee all stages of the implementation process.

Stage-based implementation

Typical success in implementation efforts is based on provision of the clinical intervention and patient outcomes. However, exclusively focusing on outcome data does not permit better understanding of which implementation strategies are successful. Because our core implementation team was interested in understanding how best to facilitate hospitals' efforts to provide IPP LARC and whether implementation science was helpful, we used a stage-based implementation approach that considered implementation outcomes beyond clinical data. There is consensus in the literature that all implementation efforts proceed through discrete stages from identification of need and exploration of potential solutions to adoption and sustainability.[15,17,18] Our team used the following 4 stages identified by Metz

TABLE 1
Implementation stages and outcomes

Exploration	Installation	Initial implementation	Full implementation
Acceptability: perception among stakeholders that the given intervention is satisfactory	Appropriateness: perceived fit of the intervention in the practice setting	Fidelity: degree to which the intervention is being delivered as intended	Penetration: extent to which the intervention is integrated in the practice setting
Adoption: agreement among stakeholders to take up the intervention	Feasibility: extent to which the intervention can be used within the given setting	Implementation cost: cost impact of implementing the intervention	Sustainability: extent to which the intervention is institutionalized in the service setting

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et al[15] to guide our stage-based approach to the implementation of IPP LARC: (1) during exploration, the need, fit, and feasibility of a new practice are assessed; (2) installation involves building the infrastructure to support the new initiative, which includes building practitioner and organizational capacity; (3) initial implementation includes the beginning of the use of the new initiative, with attention to the use of data for continuous improvement; (4) full implementation occurs as practitioners skillfully provide the new program, and outcomes are achieved.

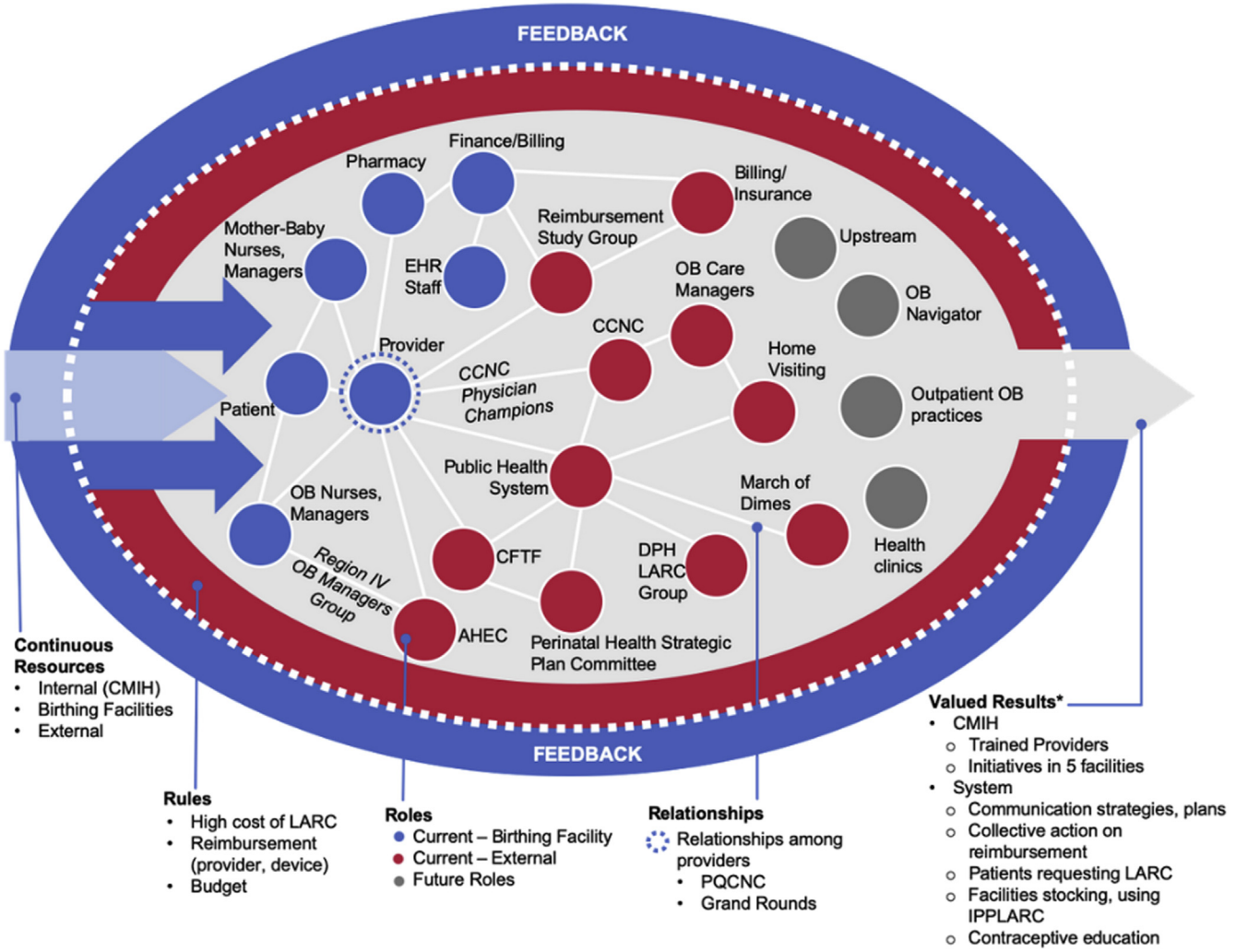
Within each implementation stage, we drew on the work of Proctor et al[19] to identify implementation outcomes that are necessary intermediate outcomes for the achievement of the desired service delivery and ultimately the clinical outcomes for patients (Table 1). This allowed us to gauge our success in supporting hospitals over the course of a time-limited grant-funded project.

A critical component of effective implementation is the enabling context within which an innovation will be implemented. Enabling context is the environment and capacity within a community and system, including policy and socioeconomic factors, that make it possible to implement the innovation.[20,21] Before beginning any work, our team conducted a systems mapping exercise using the US Agency for International Development's 5Rs Framework to understand the North Carolina implementation context for IPP LARC.[22] The goals of the exercise were 2-fold: (1) understand the state and local systems context in which IPP LARC efforts would take place and identify potential opportunities for and challenges to the project's success and (2) understand the hospital systems where IPP LARC would be implemented and identify potential opportunities and barriers to implementation. Systems mapping provided a lens for the assessment of the 5 Rs (resources, rules, roles, relationships, and results) for IPP LARC. The systems map depicts these interactions between organizations and individuals at the center (Figure 1). The roles of these actors were identified as either current or future, and distinctions between systems and hospital actors are noted. Nodes represent relationships between actors, which are dependent on available resources. Given these inputs, roles and relationships are situated to produce results. The process of converting resources into results through interactions of system actors is governed by a set of rules based on financial, political, and social limitations for IPP LARC.

The systems map revealed contextual complexity. Identified actors signaled the need to consider the role of Medicaid, the state's Pregnancy Medical Home model, and the public health system, among others. At the hospital level, perspectives of colleagues in obstetrics, family planning, lactation, billing, finance and pharmacy were identified as critical to the success of the initiative. This understanding of the system, the need for diverse stakeholder engagement, and North Carolina's historic and cultural context around reproductive justice served as a guide for the development of an implementation plan for IPP LARC.

After mapping the context for IPP LARC, our team used the stage-based approach to assess hospital readiness and plan for implementation.[15] To support hospitals in the exploration stage, we reviewed the existing literature and professional organization recommendations. We noted that a facility readiness assessment tool for IPP LARC was not available, despite the fact that readiness is an important implementation domain.[23] Using the information identified in the systems map and best practices for IPP LARC, we developed a readiness assessment that could be used for the anticipatory identification of the fit and feasibility of IPP LARC within a birthing facility (Figure 2). This tool was designed to be completed through conversation with key hospital stakeholders and to help identify implementation facilitators and barriers. After the discussion, the assessment was reviewed and scored. Results were then used to identify the next steps for implementation. If barriers were identified, potential solutions or other options were discussed. For example, in 1 system major practice changes were scheduled for implementation during the timeline for IPP LARC. The identification of this barrier resulted in a change in the implementation timeline. Understanding facility readiness is a key to implementation timelines, organizational structure, and securing project champions. Attempting to complete implementation in a facility

FIGURE 1
Systems map



The systems map provides a visual depiction of North Carolina immediate postpartum long-acting reversible contraception implementation context in the context of the 5 Rs (roles, relationships, resources, rules, and results). This diagram was created using the USAID 5Rs process. Technical Note. The 5Rs Framework in the Program Cycle, Version 2.1. Available at: https://usaidlearninglab.org/sites/default/files/resource/files/5rs_techncial_note_ver_2_1_final.pdf. Accessed August 1, 2019.

AHEC, Area Health Education Center; *CCNC*, Community Care of North Carolina; *CFTF*, Child Fatality Task Force; *CMIH*, Center for Maternal and Infant Health; *DPH*, Department of Public Health; *EHR*, electronic health record; *IPPLARC*, Immediate Postpartum Long-Acting Reversible Contraception; *LARC*, Long-Acting Reversible Contraception; *OB*, Obstetrics; *PQCNC*, Perinatal Quality Collaborative of North Carolina.

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that is not ready can impact project uptake and sustainability adversely.

Once readiness was assessed and hospitals were invested in moving forward with the initiative, teams considered the infrastructure that would be needed to transition through the stages of implementation. Our team developed and deployed a stage-based implementation checklist to outline resources and processes for effective implementation and the activities that should occur at each stage (Figure 3). It is important to note that each implementation stage does not end cleanly as the next begins. Stages often overlap, and activities in the stages relate to each other. It is not necessary for all outcomes in a stage to be achieved before proceeding to the next stage. However, sufficient progress must be made in each stage to be prepared adequately for the next. The checklist attends to 3 core implementation components: (1) the use of implementation teams, (2) the use of data and feedback loops for decision-making, and (3) the development of sustainable infrastructure.[15] The stage-based checklist was used with hospital implementation teams to identify barriers and facilitators and to ensure attention to necessary implementation strategies at each stage.

FIGURE 2
Immediate postpartum long-acting reversible contraception readiness assessment

PNOC Immediate Postpartum LARC Fit & Feasibility Assessment

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The assessment is used for anticipatory identification of the fit and feasibility of immediate post-partum LARC within a birthing facility. This tool should be completed through conversation with key stakeholders at the birthing facility and can help identify implementation facilitators and barriers. After discussion, score each domain. Scores can be considered during planning but are not intended to exclude facilities' participation.

Birthing Facility:		Date:	
Completed by:			

Need	Score *1:no need, 2: some need, 3: strong need*
1. Total number of live births in this facility	
2. Has your facility completed the LOCATe assessment? If Yes, what was the identified risk-appropriate care level?	☐ No ☐ Yes (indicate level below) ☐ I ☐ II ☐ III ☐ IV
3. Is there a current policy or process in place regarding postpartum contraception planning?	☐ No ☐ Yes (Describe briefly below.)
4. Which LARC devices are currently available on your facility's formulary?	☐ IUD ☐ Implant ☐ Both ☐ None
5. Select the LARC devices and ancillary equipment currently available at all delivery sites and/or on the postpartum unit.	☐ IUD ☐ Implant ☐ Both ☐ None
5a. Select the LARC devices for which policies, procedures, or guidelines have been modified or created to support immediate postpartum placement.	☐ IUD ☐ Implant ☐ Both ☐ None
5b. Select the departments that have modified or created policies, procedures, or guidelines to support immediate postpartum placement of **IUDs.**	☐ Labor & Delivery ☐ Billing ☐ Mother/Baby Unit ☐ All of the above ☐ OB OR ☐ None of the above ☐ Pharmacy ☐ Other *(specify)*

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Reproductive justice

Increasingly, the field of implementation science is concerned with how implementation strategies can be used to increase equity.[24] Our goal was to use a reproductive justice framework to implement IPP LARC provision in a person-centered care framework for reproductive health. Diamond-Smith et al[25] describes the person-centered care framework of reproductive health as having dignity, autonomy, privacy/

FIGURE 2
(*Continued*)

5c. Select the departments that have modified or created policies, procedures, guidelines to support immediate postpartum placement of **Implants.**	☐ Labor & Delivery ☐ Billing ☐ Mother/Baby Unit ☐ All of the above ☐ OB OR ☐ None of the above ☐ Pharmacy ☐ Other *(specify)*
6. Have billing codes been established and tested? If yes, for which devices?	☐ No ☐ Yes (indicate for which devices below) ☐ IUD ☐ Implant ☐ Both
6a. Is the facility fiscally prepared currently to bear the costs of devices that are not reimbursed?	☐ No ☐ Yes (indicate for which devices below ☐ IUD ☐ Implant ☐ Both
7. Have IT revisions been completed to assure adequate data collection, tracking and documentation? If yes, for which devices?	☐ No ☐ Yes (indicate for which devices below) ☐ IUD ☐ Implant ☐ Both
7a. Select the IT revisions that have been completed to assure adequate data collection, tracking and documentation for **IUDs.**	☐ EHR for consent ☐ Billing system ☐ EHR for contraceptive choice counseling ☐ Tracking tools ☐ All of the above ☐ Order sets ☐ None of the above ☐ Pharmacy system
7b. Select the IT revisions that have been completed to assure adequate data collection, tracking and documentation for **Implants.**	☐ EHR for consent ☐ Billing system ☐ EHR for contraceptive choice counseling ☐ Tracking tools ☐ All of the above ☐ Order sets ☐ None of the above ☐ Pharmacy system
Fit	**Score** ***1: no fit, 2: some fit, 3: strong fit***
8. How does immediate post-partum LARC fit with the birthing facility's priorities?	
9. How does immediate post-partum LARC fit with community values and priorities in the community in which the birthing facility operates?	

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confidentiality, communication with providers/patients, social support in the facility including family members, supportive care, trust in providers, and health facility environment. Person-centered care provided a framework to acknowledge and respect the historic and current context of women's fertility and lactation. These concerns, combined with modern tensions around LARC coercion, reinforced our priority around supporting women's preferences. These preferences may also be related to contraception or breastfeeding and may not align with broader public health

FIGURE 2
(*Continued*)

10. What other initiatives or practices currently being implemented will intersect with immediate postpartum LARC (i.e., Baby Friendly certification)? Will the other initiatives make implementation easier or more difficult?	
Capacity	**Score** *1: no capacity, 2: some capacity, 3: strong capacity*
11. Who will need to be an active part of the IPP LARC initiative team in your hospital? Check all that apply.	☐ Administration ☐ Lactation consultant ☐ MCO Liaison ☐ OB provider ☐ Pharmacy ☐ All of the above ☐ Billing ☐ Other *(specify)* ☐ Nursing
11a. Who has already been engaged in consideration of IPP LARC in your hospital? Check all that apply.	☐ Administration ☐ Lactation consultant ☐ MCO Liaison ☐ OB provider ☐ Pharmacy ☐ All of the above ☐ Billing ☐ Other *(specify)* ☐ Nursing
12. Is facility leadership knowledgeable about supportive of IPP LARC?	☐ No ☐ Yes
13. Have any staff completed an education program on the importance of offering immediate postpartum LARC?	☐ No ☐ Yes (indicate professionals below) ☐ Administration ☐ Lactation consultant ☐ MCO Liaison ☐ OB provider ☐ Pharmacy ☐ All of the above ☐ Billing ☐ Other *(specify)* ☐ Nursing
14. Have any staff completed an education program on the skills needed to administer immediate postpartum LARC?	☐ No ☐ Yes (indicate professionals below) ☐ OB provider ☐ Pharmacy ☐ All of the above ☐ Nursing ☐ Other (*specify*)
Other notes	
15. What barriers to implementation exist that may not have been captured above?	

Questions? Please contact Kimberly Harper - kimberly_harper@med.unc.edu.

This assessment guides hospital stakeholders through an appraisal of fit and feasibility for immediate postpartum long-acting reversible contraception implementation in their facility. Adapted from the Florida Perinatal Quality Collaborative's ACCESS LARC: Pre-Implementation Phase Monthly Data Collection Form http://health.usf.edu/publichealth/chiles/fpqc/larc/~/media/678AB1E5A7864E8C9F2A78F4A253B8A8.ashx and the National Implementation Research Network's Hexagon Tool https://implementation.fpg.unc.edu/resources/hexagon-exploration-tool. Copyright 2019 National Implementation Research Network, University of North Carolina at Chapel Hill. Used with permission.

EHR, electronic health record; *IPP*, immediate postpartum; *IT*, information technology; *IUD*, intrauterine device; *LARC*, long-acting reversible contraception; *LOCATe*, levels of care assessment tool; *MCO*, managed care organization; *OB*, obstetrics; *OR*, operating room; *PNOC*, perinatal neonatal outreach coordinator.

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FIGURE 3
Stage-based checklist for immediate postpartum long-acting reversible contraception implementation

Facility		Date	
Facility Project Leads			

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Implementation Stage	IPP LARC Outcomes in this Stage
Exploration *Key activities* • Identify the need for change • Learn about possible interventions that may provide solutions • Learn about what it takes to implement IPP LARC effectively • Develop a team to support the work as it progresses through the stages • Grow stakeholders and champions, • Assess and create readiness for change • Develop communication processes to support the work and decide to proceed (or not).	☐ Demonstrated need for IPP LARC ☐ Provide clinical evidence ☐ Demonstrated fit and feasibility of IPP LARC through IPP LARC Readiness Assessment ☐ Demonstrated readiness and buy-in from: ☐ Providers ☐ Leadership ☐ Pharmacy ☐ Billing ☐ Finance ☐ Stakeholders ☐ Champions ☐ Implementation team formed ☐ Implementation team charter developed clarifying the team's way of work ☐ Communication protocol developed to support bi-directional communication between the team, stakeholders and leadership ☐ Identify necessary infrastructure elements to support IPP LARC practice and related organizational and systems change

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goals that are related to unintended pregnancy or baby-friendly hospitals. Although we strive to improve the availability of LARC through access in the IPP, we also recognize that this availability does not assume uptake. For this reason, the project has not set any benchmarks for IPP LARC uptake.

Critical to ensuring a reproductive justice framework in this initiative was training providers, not only in IPP LARC insertion, but also in the historic context of eugenics in North Carolina and the importance of appropriate, noncoercive contraceptive counseling. All providers trained in IPP LARC insertion through this project were provided both didactic and skill-based clinical training coupled with didactic training on reproductive justice. The content for provider training integrated concepts of reproductive justice, shared decision-making, and the history of eugenics in North Carolina. The importance of on-demand LARC removal was emphasized during the training as an important aspect of the reproductive justice framework.

Particularly critical to the reproductive justice lens was the framing of contraceptive counseling and patient education materials.[23] Although there are a number of patient education and contraceptive counseling materials that cover LARC, our team was unable to find materials that focus specifically on considerations for IPP LARC insertion at the desired patient education level. Using a person-centered care framework, our team engaged with patient advisors to codevelop patient education materials. Stock patient education materials for contraception were adapted to educate patients on the process, benefits, and risks of IPP LARC insertion, what patients can expect after their IUD or implant is placed. These materials were developed at an eighth-grade reading level and were reviewed by patient and family advisors before publication.

Results

Our project collaborated with 5 hospitals in North Carolina: 3 tertiary facilities and 2 community facilities. These hospitals are located in a single perinatal region selected by the funding agency. Hospitals in the region completed a fit and feasibility assessment for IPP LARC during an initial engagement discussion. Based on findings of the assessment and other internal factors, hospitals

FIGURE 3
(*Continued*)

Installation

Key activities

- Secure and develop the support needed to put IPP LARC into place as intended
- Develop feedback loops between the practice and leadership levels in order to streamline communication
- Gather feedback on how IPP LARC will be implemented

- ☐ Assess team competencies to support IPP LARC access
- ☐ Develop implementation team competencies to support IPP LARC access
- ☐ Assure financial resources (e.g. funding, FTE) to support IPP LARC access
- ☐ Institute practice-policy feedback loops between practitioners, implementation team and leadership
  - ☐ Providers have access to IPP LARC data and are equipped to use them for improvement
- ☐ Majority of providers trained in IPP LARC (Nexplanon, IUDs) placement, contraceptive choice counseling
  - ☐ Training plan developed to address placement and contraceptive choice counseling
  - ☐ Implant certification obtained
- ☐ Infrastructure created to support provider coaching and ongoing improvement
- ☐ Policies have been created/modified to enable acquisition and availability of and reimbursement for IPP LARC placement
- ☐ Process for orienting patients to IPP LARC and obtaining consent in place
  - ☐ Consent forms created or modified for use
  - ☐ Patient education materials created or modified for use
- ☐ Pharmacy processes and policies are in place
  - ☐ Address formulary revisions
  - ☐ Determine pharmacy costs (device, local anesthetic, stocking charge)
  - ☐ Determine inventory levels, stocking locations and order system revisions
  - ☐ Purchase devices
  - ☐ Storage location identified
  - ☐ Develop storage-to-bedside device flow
- ☐ Billing and collections processes and policies are in place
  - ☐ Billing processes for the device, facility and provider
  - ☐ Initiate contract amendments with payers
  - ☐ Customize the claims processes
  - ☐ Test billing revisions to assure reimbursement
  - ☐ Update documentation as needed
- ☐ IT and HER process and policies are in place
  - ☐ Clinical documentation established for provider ordering and charting
  - ☐ Charge capture
  - ☐ Inventory notification
  - ☐ Implant/device log
- ☐ Cross-departmental collaboration on processes and policies are in place
  - ☐ Establish guidelines and work flows for L&D, obstetric operating rooms, and postpartum floor

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self-selected to participate in the implementation of IPP LARC.

Teaming and champions

The core implementation team consisted of 7 members: the Perinatal Neonatal Outreach Coordinator, assistant director of the UNC Center for Maternal and Infant Health, 2 implementation specialists, a maternity care coordinator, and 2 family planning specialist physicians. Team members were selected because of their expertise in family planning, hospital systems, and implementation science. The core team identified 1 of the family planning physicians as its champion. The core team served as a liaison between hospitals and state organizations, such as Medicaid and North Carolina of the Department of Health and Human Services' Women's Health Branch. This relationship provided facilities with connections to navigate barriers effectively that became evident during implementation. The core team, which lead the project overall, provided technical support to each of the hospital-based teams as they navigated their individual, institutional challenges to sustainable IPP LARC implementation.

In parallel with the core team, each hospital team formed a linked implementation team. Members included obstetrics providers; nursing staff; lactation consultants; information technology, pharmacy, billing and reimbursements department representatives; outpatient maternity care coordinators; and patient and family advisor liaisons. These diverse implementation teams were able to assess, to plan for, and effectively to build needed infrastructure before implementation to ensure clinical changes are well-supported. Teams that were most effective had physicians and nurse coleads and team members who were invested in IPP LARC and had the skills necessary for implementation and supporting systems change.

Implementation science

The implementation readiness assessment for IPP LARC was completed with each hospital and was used to anticipate potential barriers and opportunities. Identified barriers ranged from the requirement of health system engagement to make changes to the electronic health record to potential education overload on staff members because of multiple improvement projects within the obstetrics care unit. Several hospitals

FIGURE 3
(Continued)

Initial Implementation *Key activities* • Initiate IPP LARC • Providers and other staff use new skills and practices, and getting better in implementation • Gather data to check in on how implementation is going and develop improvement strategies based on the data • Refine implementation supports based on these data.	☐ Implementation team is able to troubleshoot and problem-solve implementation issues ☐ Data are reviewed and used at each team meeting to promote improvement ☐ Data are used to stabilize the implementation of IPP LARC ☐ Practitioner fidelity is tracked and improved ☐ Majority of providers implementing IPP LARC as requested by patients ☐ Equipment and supply lists are available ☐ Ready-to-open kids are available ☐ Educational refreshers and job aides are provided ☐ Training is provided for new hires ☐ Placement locations (OR, L&D, postpartum) and timing (immediate post-placental v. immediate postpartum) have been identified and processes are in place for each ☐ Infrastructure for provider coaching and ongoing improvement is refined and improved based on use ☐ Policies are refined and improved based on use ☐ Process for orienting patients to IPP LARC and obtaining consent are refined and improved based on use ☐ Consent forms and accompanying patient education materials refined and improved ☐ Data access is refined and improved based on use ☐ Pharmacy processes and policies are refined and improved based on use ☐ Billing and collections processes and policies are refined and improved based on use ☐ Cross-departmental collaboration on processes and policies are refined and improved based on use ☐ Guidelines and work flows for L&D, obstetric operating rooms, and postpartum floors are refined and improved based on use ☐ Variability in quality of IPP LARC process, however quality is improving across providers
Full Implementation *Key activities* • Skillful use of IPP LARC is well-integrated into the repertoire of practitioners and routinely and effectively supported by providers and by leadership.	☐ Implementation team uses improvement cycles to develop and test enhancements ☐ Outcome data are available ☐ Data are collected to support fidelity monitoring and improvement ☐ Data about patients' needs are aggregated and used to inform evaluation, ongoing quality improvement and decision-making (e.g., ensure IPP LARC resources effectively meet needs) ☐ All providers are maintaining skillful IPP LARC placement as requested by patients ☐ IPP LARC insertions are being completed with quality and ease ☐ Fidelity to IPP LARC insertion achieved by most providers ☐ More efficient and/or effective infrastructure produced to support outcomes

The stage-based checklist details key activities that must be completed in the exploration, installation, initial implementation, and full implementation of the program. Courtesy of the National Implementation Research Network. Used with permission.

IPP, immediate postpartum; *LARC*, long-acting reversible contraception.

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that were engaged in our project were embedded in larger healthcare systems; changes within these systems required convening system hospitals and facilitating agreement about recommended changes at the system level. The information gained from the readiness assessment was used to create timelines and workflows for implementation processes.

Our project noted that teams from all hospitals demonstrated the readiness criteria to implement an IPP LARC project successfully. Each hospital then progressed through the implementation stages, achieving variable outcomes depending on contextual barriers. Table 2 summarizes the implementation stage, length of engagement and implementation outcomes achieved for each facility. Each hospital began exploration at different time points, with some having previously considered or accessed funding for IPP LARC implementation. All facilities successfully identified champions to move the initiative forward. Most facilities identified adding LARC devices to pharmacy formularies and justifying associated expenses as a major barrier. Given the complexity of changing large healthcare systems, the use of implementation outcomes as intermediate measures of success helped our team identify successes, even for hospitals that did not begin providing IPP LARC during the grant period.

Reproductive justice

Our team completed 11 trainings with 140 providers on IPP LARC insertion and reproductive justice. Although these trainings were well-received, there is no mechanism to ensure the providers would continue to use a reproductive justice lens in their daily practice. Integration of standard workflows to uplift and support reproductive justice in the providers' hospitals would be necessary to ensure continued attention to reproductive justice. Implementing hospitals were encouraged to track outcomes with an equity perspective to assess the impact of the project from a reproductive justice standpoint. Making sure all women are offered the approach as a components of standard counseling, which includes access to removals, are key metrics to addressing reproductive justice.

TABLE 2
Length of hospital engagement, implementation stage and implementation outcomes

Hospital	Implementation stage (at completion of grant period)	Length of time for targeted support, mos	Implementation outcomes achieved (Table 1)	Comments
1	Exploration	3	Working towards acceptability	Reimbursement protocols and policies related to immediate postpartum long-acting reversible contraception have prevented facilities from successfully meeting the outcome of adoption; institutions continue to use processes to determine facility return on investment and policies to support financial acceptance.
2	Exploration	3	Working towards acceptability	Reimbursement protocols and policies related to immediate postpartum long-acting reversible contraception have prevented facilities from successfully meeting the outcome of adoption; institutions continue to use processes to determine facility return on investment and policies to support financial acceptance.
3	Installation	12	Acceptability; adoption; working on appropriateness	Understanding the ability of the facility to support the financial investment for immediate postpartum long-acting reversible contraception for consumers with varying mechanisms of payment is currently under investigation within this facility.
4	Initial Implementation	6	Acceptability; adoption; appropriateness; feasibility; fidelity; working towards implementation cost	Transition through the various stages of the implementation process was enhanced by this institution's ability to secure outside financial support to cover costs that are associated with costs for long-acting reversible contraception devices; this facility is in the process of identifying mechanisms to support sustainable financial mechanisms for patients with varying insurance types.
5	Initial Implementation	14	Acceptability; adoption; appropriateness; feasibility; working on fidelity	Reimbursement protocols and policies have been developed that, although time intensive, should lead to sustainability of the service, especially as the payor mix broadens; full implementation has been challenged by multiple other initiatives and a desire to minimize disruption to fragile workflows.

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In an ideal implementation process, patient and family advisors are engaged throughout the process, particularly during the exploration stage, which allows key stakeholders to identify potential barriers to implementation and opportunities to advance equity. The core team was created to support the development of individual facility implementation teams that integrated and supported the use of patient and family advisors. Facilities determined the timing of patient engagement based on institutional policies and standard practices. Our core team engaged these stakeholders in the development of patient education materials. Advisors who were engaged conveyed gratitude for the ability to provide input. Their inclusion in the process was viewed as a partnership between the patient and the healthcare team to support shared decision-making. Patient advisors will remain an active part of ongoing quality improvement processes for the implementation and sustainability stages. Although implementation science is interested in advancing equity, the field is still struggling with how to measure equity as an outcome of implementation.

Comment

The use of interdisciplinary implementation teams to move IPP LARC forward was a key strength of this approach. Having access to a broad array of skillsets and loci of control made it possible for both the core team and linked hospital teams to navigate barriers to implementation. The core team also identified lessons learned to inform implementation as the project moved forward, applying best practices while being attentive to the context of each birthing facility. Implementation science provided critical grounding for the work. Using a stage-based approach allowed teams to sequence and scope the work appropriately and provided framing for the technical assistance that was provided by the core team. Although the use of a reproductive justice lens is not novel, per se, our team found these principles to be critical in guiding our work when the next steps were unclear.

One potential weakness of this approach is the time needed to reproduce this intervention. Although there were no significant costs beyond staffing

for the core team, the time needed to build the core implementation team and linked hospital teams and to build buy-in was considerable. The implementation science literature documents that the exploration and installation stages may take up to a year or more, which creates a potential barrier to some facilities.[26] Time spent in each stage varied per facility based on the supports available. Transition timing within our project was congruent with timing that was noted in other states with implementing IPP LARC projects.[27] Although many patient barriers to accessing IPP LARC were addressed, cost and reimbursement continue to be a challenge. Medicaid reimbursement policies enabled facilities to consider support of the IPP LARC. However, the uncertainty of Medicaid reimbursement amounts and practices for other payors delayed uptake in certain institutions. Although significant attention was paid to training providers and developing systems that will honor patient-preferences, a tiered reimbursement system (coverage by Medicaid and uncertain/changing coverage by private payors) sets up the potential for a process that appears to target Medicaid patients. Discussion and negotiation with private payors are ongoing to ameliorate these discrepancies. In the interim, historically vulnerable populations have more access to IPP LARC, which could appear as unintentionally targeted care. Given North Carolina's long history of racially stratified reproduction, we remain vigilant in our efforts to provide patient-centered care and will lean on our patient advisors to provide feedback regarding actual experiences and perceptions of care.

The 3 innovative aspects of our implementation process, taken together, result in a systematic, multidisciplinary, and culturally appropriate model for IPP LARC that can be replicated across hospitals. This model will help allow this evidence-based practice to become a routine part of the options that are available to women as they consider their postpartum priorities.

We recommend birthing facilities that are exploring IPP LARC use a similar approach that identifies implementation stages and outcomes as a guide for their work. Birthing facilities can use the resources developed for this project to build diverse teams and engage champions, assess readiness, and target both clinician competency and organizational infrastructure to ensure sustainability. A focus throughout the process on reproductive justice will aid in the development of relevant, efficient, and equitable care processes. ■

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