

Labor Induction and Augmentation Practices in India

How the Use of Uterotonic Medications Affects Stillbirth, Neonatal Mortality, and Use of Cesarean Deliveries

MOMENTUM Knowledge Accelerator

RESEARCH CONSOLIDATION | April 2024



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SECTION 01

Background on Uterotonics and Potential for Harm

What are uterotonics?

Medications (e.g., oxytocin) that cause the uterus to contract.

Uterotonics Can Save Lives and Reduce Harm

By preventing and treating
excessive bleeding after birth

By starting labor (induction)

By strengthening and speeding
up labor (augmentation)



However, to be safe when used before birth, uterotonics require a good medical reason for use and close monitoring.

Monitoring Requires **Adequate Numbers of Skilled Staff** to Recognize Danger Signs and Take Action When Needed

Monitoring includes:



Fetal heart rate



Uterine contractions



Never leaving the patient unattended (WHO)^{1,2}



1. World Health Organization. (2014). Recommendations for augmentation of labour.
2. World Health Organization. (2022). Recommendations on induction of labour, at or beyond term.

Without monitoring, uterotonics to start or strengthen labor can cause harm.

Risks include stillbirth, birth asphyxia, neonatal encephalopathy, early neonatal death, and unnecessary cesarean deliveries.

Avoiding Breathing failure

Newborns' inability to breathe at birth is a major cause of neonatal deaths and stillbirths globally.¹

Unmonitored use of uterotonics for labor augmentation can cause a woman's uterus to have excessively long contractions, reducing oxygen to the fetus.

This can result in stillbirth, need for resuscitation, neonatal encephalopathy, and early neonatal death.²

1. World Health Organization (2022). Newborn mortality fact sheet. Available at <https://www.who.int/news-room/fact-sheets/detail/newborn-mortality>. Accessed on February 10, 2024.
2. Kujabi, M.L. et al. (2022). Labor augmentation with oxytocin in low- and lower-middle-income countries: a systematic review and meta-analysis. *AJOG Global Reports*, 2(4):100123. <https://doi.org/10.1016%2Fj.xagr.2022.100123> .



Preventing Unnecessary Cesarean Deliveries

Inducing labor without protocols, monitoring, or adequate information about the pregnancy has risks, including:

- fetal distress
- meconium aspiration
- uterine rupture
- premature birth¹

This can lead to emergency cesareans that would not have otherwise happened.

1. Vogel, J.P. et al. (2014). Global perspectives on elective induction of labor. *Clinical Obstetrics and Gynecology*, 57(2), 331-42. <http://dx.doi.org/10.1097/GRF.0000000000000031>.



Magnitude of Harm

A recent meta-analysis found uterotonic use for labor augmentation in low- and middle-income countries¹ is associated with an **increased risk** of:

- Stillbirth and Day 1 neonatal mortality [RR 1.46; 95%CI 1.05, 2.02]
- Neonatal resuscitation [RR 2.69; 95%CI 1.87, 3.88]
- Neonatal encephalopathy [RR 2.90; 95%CI 1.87, 4.49]
- Low Apgar score at birth [1.54; 95%CI 1.21, 1.96]

1. Kujabi, M.L. et al. (2022). Labor augmentation with oxytocin in low- and lower-middle-income countries: a systematic review and meta-analysis. *AJOG Global Reports*, 2(4):100123. <https://doi.org/10.1016%2Fj.xagr.2022.100123>.

Reducing unindicated and under-monitored uterotonics use can **reduce these risks and save lives.**



SECTION 02

Uterotonics Use in India

Opportunities for India to Lead Childbirth Improvements Globally



Nearly 1 in 5 babies worldwide are born in India.

Changes in India can influence changes throughout the world.

Uterotonics Use During Labor Varies Both Globally and in India, But It Can Be Very Common

Data from systematic reviews on the prevalence of uterotonics use

FOR STARTING LABOR (induction)

- **India:** 3%–84% of births¹
 - Wide variation

FOR STRENGTHENING LABOR (augmentation)

- **Global:** 0.7% to 97% of births²
- **India:** > 50% of labors augmented with oxytocin (among the highest rates)²

1. MOMENTUM Safe Surgery in Family Planning and Obstetrics; Systematic review of pharmacological labor induction and augmentation in South Asia. Manuscript forthcoming in 2024.

2. Kujabi, M.L. et al. (2022). Labor augmentation with oxytocin in low- and lower-middle-income countries: a systematic review and meta-analysis. *AJOG Global Reports*, 2(4):100123.

<https://doi.org/10.1016%2Fj.xagr.2022.100123>.

What Drives Uterotonics Use For Doctors And Nurses in India, Even When Safeguards and Staffing Are Lacking?



“LEGACY” PRACTICES

Common practice at
medical colleges

Practices repeated in
less-resourced primary
and community settings



TIME AND SPACE CONSTRAINTS

Pressure to expedite
deliveries to free up
staff and beds



DEMAND FROM PATIENTS/FAMILIES

Cultural practice for
women to request
uterotonics to make labor
strong and fast



LOW PERCEPTION OF HARM

Little recognition that
routine uterotonic use
and lack of fetal and labor
monitoring increase
danger

Why Do Patients And Families Desire Uterotonics?



POSITIVE PERCEPTION OF UTEROTONICS

Speed up labor, shortening
time spent at a facility

IV drip or injection seen as
good care



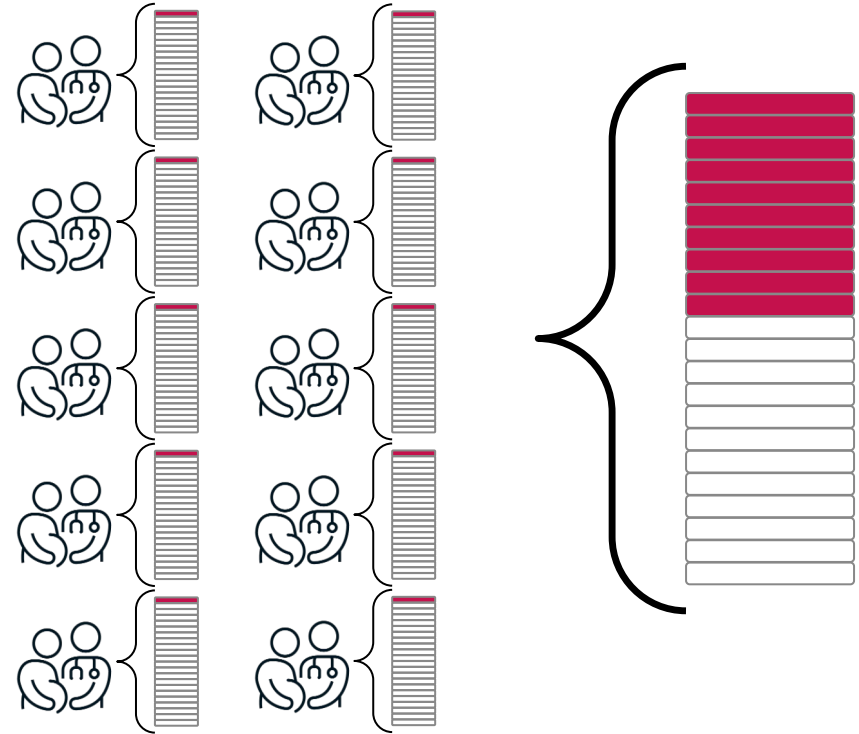
LOW PERCEPTION OF HARM

Most unaware that unindicated
and unmonitored uterotonics
use can lead to poor outcomes
in typical settings

From Individuals to Systems



What might seem like a small risk of harm in an individual case...



...can lead to a large risk of harm at the current scale of use.



SECTION 03

Current Perspectives, Guidelines, and Research

Across stakeholders, the potential for harm from uterotonics use was not a major concern

“It is harmful, but a little bit might not do too much harm. We don’t measure ingredients when we cook. It is all about a little of this, a little of that. This attitude extends to medication administration.”

—Nurse

(Paraphrased from interview)

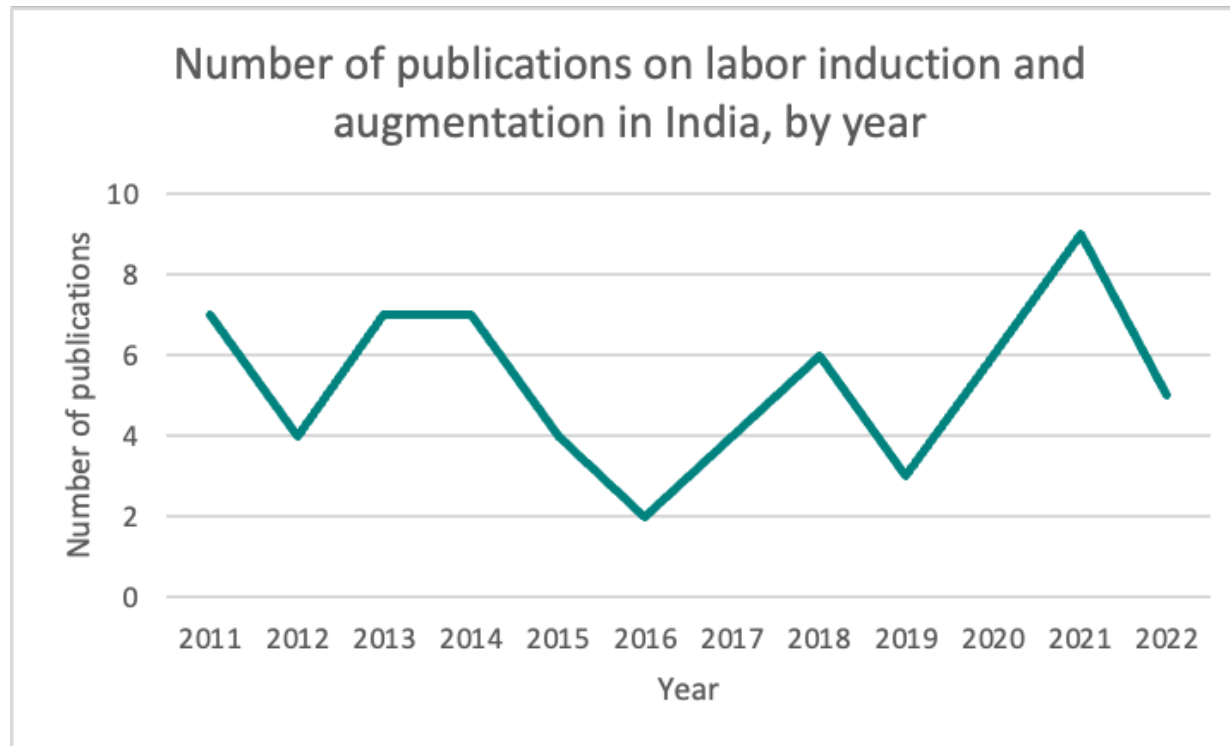
In other words, uterotonics use is a calculated risk, even when safeguards are lacking

GUIDELINES: Documents Exist, But Gaps Persist

- Guidelines exist globally and in India for labor induction and augmentation but are **not put into practice**
- Within the guidelines, there are several points that are unclear. For example:
 - Guidance on case selection
 - What constitutes “failed induction?”
 - Management strategies if a patient’s antenatal care history is unknown
- **There is no standard protocol** on drug types, doses, timing, and documentation



RESEARCH: Multiple Studies And Publications Have Been Conducted In India On Labor Induction And Augmentation Every Year



Mainly quantitative studies are conducted in India, yet a meta-analysis was not possible due to a lack of standardized measurement

Research Gaps (1/2)

- What are successful and sustainable behavior change strategies to ensure safe, protocolized management of labor induction and augmentation among health workers?
- How can messages about potential harm be best communicated to women and families and raise community awareness of the practice?
- What is the optimal and appropriate use of labor augmentation, especially for complex cases, given staffing and resource constraints?

Research Gaps (2/2)

- What systemic changes are needed to combat current overuse?
- How can rates of labor induction and augmentation—and associated safeguards—be accurately and systematically measured across multiple states in India?
- What proxy indicators may be appropriate for monitoring uterotonic use and potential misuse (e.g., time from admission to delivery)?
- Given the ongoing challenge of variable oxytocin quality, how can health care workers assess and manage this inconsistency to provide the safest care?



SECTION 04

Next Steps

Next Steps for Changing Practices in India (1/2)

- **Build consensus** and awareness of negative health effects of uterotonics overuse among doctors, nurses, ASHAs, patients, and families.
- **Consolidate the research agenda** to systematically explore and document overuse in a standardized way.
- **Address ambiguity in guidelines** related to indications and what cases should—and should not—have labor induction or augmentation.



Next Steps for Changing Practices in India (2/2)

- **Explore strategies to improve safety** of uterotonics use during labor in resource-constrained settings.
- **Standardize protocols for labor induction and augmentation**, emphasizing proper monitoring, dosing, variations depending on indication, and management of adverse events.
- **Secure joint support** from the public sector, private sector, and community groups to develop aligned messaging and strategies.





Appendices

More Details about Stakeholder Perspectives,
Current Programs and Efforts, and Existing Research



Appendix A

Stakeholder Perspectives

Stakeholder Perspectives

- Interviews conducted between May and July 2023 with six stakeholder groups:
 - Obstetric society/private sector
 - Indian Council of Medical Research (ICMR)
 - Accredited Social Health Activists (ASHAs)
 - Nurses
 - Implementers from Bihar and Uttar Pradesh
 - Researchers from a large medical college
- Individual or group interviews based on participant preference
- Total participants in MKA-facilitated interviews: 13
- Community Empowerment Lab facilitated interviews with nurses and ASHAs due to language differences and/or preference for in-person discussions



Obstetric Society/Private Sector

- Routine use of uterotonics to start and augment labor is common.
- In a short convenience survey of 39 private practitioners:
 - More than a quarter (28%) reported using routine labor augmentation for all women, most commonly via IV drip (rarely pump infusion).
 - 1 in 5 practitioners offered routine labor induction to all women, including cases of maternal request.
- The biggest health concern with uterotonics use during labor is the increased potential for postpartum hemorrhage (PPH).

POSTPARTUM SAFETY

Uterotonics are standard care to prevent PPH. Since the baby has been delivered, **minimal safeguards are needed for postpartum use.**

Private Sector Insights on Labor Induction

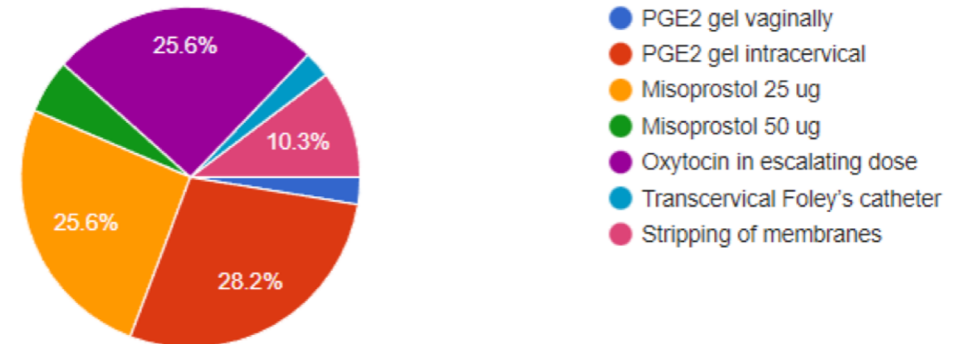
Results from an Informal Survey of Private Practitioners in 2023

Among private sector obstetricians surveyed:

- 95% conduct pre-induction scoring before starting induction of labor.
- 28% offer induction in women with previous lower segment caesarian section.
- There was a lack of consensus on the gestational age that is considered low risk for induction (Range 37 to 40+ weeks).

Which is your preferred method of induction?

39 responses



Private Sector Insights on Labor Augmentation

Results from a Small 2023 Convenience Study

Among private sector obstetricians surveyed:

- There are differences in the starting doses of medications used for augmentation.
- 97% use oxytocin for augmentation.
- There is a lack of consensus on when to start a partogram (3cm vs 4cm vs 5cm).
- 66% report always using a partogram.

Indian Council of Medical Research (ICMR)

- Current research agendas:
 - Overuse of cesarean deliveries
 - Reducing neonatal mortality to single digits
- Unindicated and unsafe use of uterotonics connects to both agendas.
- ICMR could be well positioned to initiate a research agenda around overmedicalization/overuse of uterotonics for labor induction and augmentation.

ASHAs/Patients

CHALLENGE: Perceptions

Differing perceptions influence ASHAs' practice across districts and states:

- **Perception: Medicalized birth = better care** (often in higher-resourced settings).
- **Perception: Desire for a fast, vaginal birth** (often in lower-resourced settings).

Acting on either perception increases uterotonics misuse.

CHALLENGE: Method of administration

- Intramuscular (IM) administration of uterotonics in the community is common.
- IM is a less difficult and more accepted route for administration in the community than intravenous (IV).

IM poses a higher risk because it cannot be titrated after it is given (unlike IV).

Leaders/supervisors often do not actively address longstanding practice of uterotonics misuse.

Nurses

- Intensive nurse mentoring is effective at reducing uterotonics use during labor.
- However, the lighter-touch strategy needed for scale that relies on usual nurse supervisory mechanisms may be insufficient to sustain changes.

Implementers From Bihar and Uttar Pradesh

- Overuse and unsafe use of uterotonics is a well-known, longstanding issue.
- A multi-pronged approach is needed to:
 - Shift perceptions about risk and harm
 - Reduce demand for uterotonics from clinicians and the community
 - Get buy-in from ASHAs and rural medical providers
 - Balance messaging around oxytocin quality concerns (lack of potency of the medication) and the need for safeguards
- Uterotonics misuse may be affecting mortality:
 - However, building evidence is difficult as uterotonics misuse is often a hidden, undocumented behavior.
 - Reducing Day 1 mortality, neonatal mortality, and birth asphyxia is a major focus currently, especially in Uttar Pradesh.



PART OF THE PICTURE

Misoprostol is also misused to induce labor in home birth settings.

Researchers at a Large Medical College

KNOWLEDGE GAPS

Definition of “failed induction” is unclear:

- If a small dose of uterotonics is given with little initial result, it can be called a “failed induction,” which justifies cesarean delivery.

2018 RCT¹ encouraged induction to become standard practice in India:

- RCT showed that induction at 39 weeks reduces the need for cesarean delivery.
- Unlike in an RCT, safeguards such as monitoring and adequate staffing are lacking in many settings in India.

IMPLEMENTATION GAPS

Despite guidelines and knowledge, best practices don't always occur in facilities:

- Artificial rupture of membranes (ARM) and uterotonics use are common.
- Proper monitoring is often lacking, mostly due to not having enough staff.

BIG PICTURE: More nurses and doctors are needed to make birth safer.

1. Grobman, W.A. et al., Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal–Fetal Medicine Units Network. (2018). Labor induction versus expectant management in low-risk nulliparous women. *New England Journal of Medicine*, 379(6): 513-23. <https://doi.org/10.1056/nejmoa1800566>.



Appendix B

Current Programs and Efforts

Nurse Mentoring Programs (Bihar, Uttar Pradesh)

In nurse mentoring programs, senior nurses directly guide nurses conducting deliveries on correct practices through sharing knowledge, demonstrating correct care, and giving feedback on progress. This mentoring relationship continues over months to years.

SUCCESS: Intensive supervision/mentorship model reported **overall improvement** in nurses' care of mothers and babies before and immediately after delivery.

- In Bihar, this was most effective for reducing unsafe uterotonics use for labor induction, although the impact on labor augmentation was less clear.

CHALLENGE: Labor monitoring practices to ensure safety during uterotonics use remain difficult to implement and sustain.

CHALLENGE: Recent shift to lighter-touch efforts that rely on existing nurse supervisory structures in public facilities may be less effective in sustaining correct uterotonics use.

Other Efforts in India

COMMUNITY AWARENESS CAMPAIGNS (Bihar)

CHALLENGE: Initial efforts to change patient, family, and community perceptions on routine uterotonic use during labor and to raise awareness of harm have not shown much impact.

REGULATION OF OXYTOCIN SUPPLY AND AVAILABILITY (multiple states)

SUCCESS: Reduced incorrect use of oxytocin.

CHALLENGE: Oxytocin is needed to prevent and treat postpartum hemorrhage; restriction affected availability of life-saving drug.

CHALLENGE: Oxytocin is widely used in agriculture and farming.



Appendix C

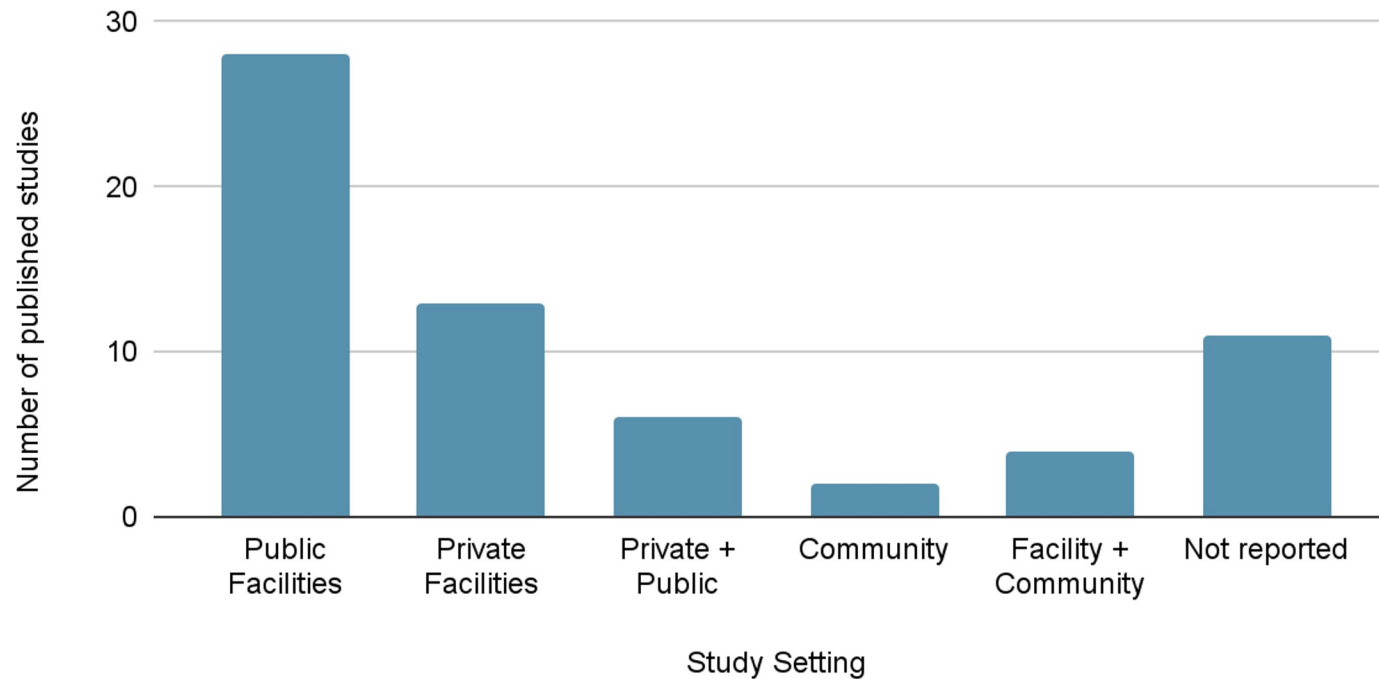
Existing Research

Existing Research

- Many studies on labor induction and augmentation globally and in India
- Variations in measurement → difficult to make strong conclusions
- A 2022 systematic review found 64 studies in India on these topics since 2011
 - Primarily took place in public facility settings
 - Conducted across multiple regions and states in India
 - Limited by small sample sizes, non-standard measurement

Existing Evidence is Primarily from Public Sector Facilities

Number of published studies on labor augmentation and induction in India from 2011 to 2022, by study setting



Research Studies on Labor Induction and Augmentation Have Been Conducted in Various Geographies in India

State/geography (North, Central, East)	Number of studies published between 2011 and 2022
Delhi	5
Uttar Pradesh	5
Punjab	3
Bihar	2
Chandigarh	2
Haryana	2
Himachal Pradesh	2
Chhattisgarh	1
Jharkhand	1
Madhya Pradesh	1
TOTAL (North, Central, East)	24

State/geography (South and West)	Number of studies published between 2011 and 2022
Karnataka	7
Maharashtra	7
Tamil Nadu	4
Gujarat	2
Puducherry	2
Kerala	1
TOTAL (South and West)	23
Multiple geographies in India	6
Geography not reported/ unknown	11

Non-adherence to WHO Standards for Labor Augmentation in India

Summary of findings from systematic review: 3 qualitative + 2 mixed-methods studies

DECISION TO AUGMENT LABOR

Augmentation is done without medical indication, as routine practice.

Augmentation seen by community as a sign of high-quality labor care, which increases demand.

Augmentation is common in inappropriate settings (under-equipped facilities and home).

PROCESS OF LABOR AUGMENTATION

Use of misoprostol for augmentation.

Departure from protocols: Quasi-systematic augmentation by care providers.

Augmentation by unskilled providers (Traditional Birth Attendants, DAIs).

Augmentation without partograph.

Pain as a monitoring indicator during induction.

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