LUCINA
The official journal of the National Federation of the Councils of Midwifery Profession
Lucina 2026;1(2):e379. DOI 10.82083/LUCINA_20266_379

Protecting Physiology in the Delivery Room: What is the Future of the Low Obstetric Risk Model?

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Abstract

This perspective and policy reflection explores the evolving role of midwifery care within contemporary healthcare systems, highlighting the need to reorient maternity care interventions toward models aimed at promoting and safeguarding physiological processes, centred on the person, and grounded in a rights-based approach. In the context of increasing chronic conditions, psychosocial stress, and the medicalisation of pregnancy and childbirth, the promotion of physiology – particularly during the first 1,000 days – emerges as a strategic public health priority with long-term implications for maternal, neonatal, and societal well-being. The paper examines organisational models such as the Low Obstetric Risk (LOR) framework and the Italian Community Health Centres, emphasising their capacity to enhance continuity of care, reduce unnecessary interventions, and address social and health inequities. Special attention is given to the midwife's role as case manager, including in non-physiological scenarios such as labour with epidural analgesia, where interdisciplinary collaboration and emotional, relational, and informational support remain essential. The article further discusses the competencies required of the 21st-century midwife, underscoring continuous education, advanced clinical skills, community engagement, and participation in research and innovation – including the ethical integration of artificial intelligence. The work advocates for a paradigm shift toward an integrated, holistic, and salutogenic model of maternity care, positioning midwives as key agents in promoting individualised, safe, and sustainable birth pathways.

Keywords: *Low Obstetric Risk (LOR); Midwife-led care; Physiology; First 1000 days; Community Health Centres; Epidural; Continuity of care; Salutogenesis.*

Physiology, Contemporary Society, and Health Promotion in the First 1000 Days

In a constantly evolving healthcare context, it is essential to reflect on the future of midwifery care and on how to enhance physiological processes. Contemporary society is characterised by an increase in chronic diseases, sedentary lifestyles, and rising levels of psychosocial stress. These conditions contribute to the medicalisation of physiological events, including pregnancy and childbirth, which are increasingly treated as pathological conditions requiring monitoring and clinical intervention, even when not strictly necessary.

This trend has significant implications both for healthcare systems, resulting in increased interventions and costs, and for culture, as it reduces individuals' trust in the natural processes of the human body. Therefore, promoting physiology becomes a strategic priority, particularly in pregnancy and childbirth[1]. Supporting the natural unfolding of these processes means fostering a model of health that respects biological timing and prioritises the mother–infant dyad[2,3].

A substantial body of scientific evidence has demonstrated that the first 1000 days of life – from conception to the child's second year – represent a critical window of opportunity for both individual and public health. Maternal health conditions during pregnancy, nutrition, family environment, and psychosocial support significantly influence neonatal neurocognitive, immune, and psychosocial development, as well as long-term well-being, with lasting effects into adulthood[4,5].

Investing in the first 1000 days, therefore, means investing in a healthier, more equitable, and resilient society. Public policies must recognise this priority by allocating adequate resources and promoting strong interdisciplinary collaboration between health and social professionals[4,5].

In this context, the implementation of parenting support programmes is particularly important to assist families during the delicate transition following childbirth. Attention to maternal and paternal mental health, as well as the promotion of healthy lifestyles, are essential components of a truly holistic approach.

Midwives play a crucial role in this framework through prevention, education, support, and continuous care. Their contribution extends beyond pregnancy and childbirth to include postnatal support – such as breastfeeding promotion, prevention of postpartum depression, parenting support, and guidance toward health and social services – ensuring continuity of care throughout the birth pathway. This integrated approach improves maternal and neonatal outcomes and contributes to reducing social and health inequalities.

Midwives also act as a bridge between scientific evidence and women's lived experiences, promoting a culture of birth that recognises health as a holistic, global, and One Health concept, not merely the absence of disease.

From this perspective, public policies should invest in first 1000 days programmes involving not only the healthcare sector but also educational and social services. The interconnection between physical health, mental well-being, and socioeconomic conditions highlights the need for an integrated, multidisciplinary, and multidimensional approach[4,5]. Due to their specific training and competencies, midwives play a key role in caring for women and couples throughout the birth pathway, promoting physiological processes through a salutogenic model and activating integrated care pathways when necessary.

Care and Organisational Models

The LOR Model and the Community Health Centres

The structuring of care models is one of the main challenges for contemporary healthcare systems. The traditional hospital-based, physician-centred model has ensured safety for decades but has also contributed to the progressive medicalisation of childbirth.

The transition toward midwifery-led models involves reorienting healthcare systems from fragmented, risk-oriented care toward models in which women and newborns receive equitable, person-centred, respectful, integrated, and high-quality care from conception throughout the postnatal period. This care is provided and coordinated by midwives working collaboratively within interdisciplinary teams.

Midwifery care models are adaptable across different levels and contexts, including home, community, and hospital settings; public and private sectors; public–private partnerships; low-resource settings; and humanitarian or crisis contexts. These models ensure accessibility, equity, and cultural relevance for women, newborns, families, and communities.

The core principles guiding midwifery care models include equity and human rights-based care for all women and newborns; person-centred and respectful care fostering trust and partnership; high-quality care aligned with midwifery philosophy; midwife-coordinated care across all settings; and integrated, collaborative care.

In 2017, the Italian Ministry of Health[6], issued guidelines for the autonomous management of low-risk pregnancies by midwives, leading to the progressive implementation of the Low Obstetric Risk (LOR) model. In this model, the midwife is a primary reference professional for women with low-risk pregnancies, promoting physiological processes, reducing unnecessary clinical interventions, and restoring women's active role in their birth experience.

Furthermore, Ministerial Decree 77/2022 introduced a new organisational structure for community healthcare in Italy, identifying "Community Health Centres" as key proximity-based facilities[7]. These centres aim to provide integrated, multidisciplinary, and personalised services. Within this framework, as well as in family counselling centres, midwives play a decisive role in promoting maternal and child health, prevention, and health education, while also reducing inequalities in access to care[7].

The implementation of the LOR model and Community Health Centres contributes to reducing inappropriate hospitalisations, improving continuity of care, and enhancing the healthcare system's responsiveness to population needs. An important consideration is the need to integrate community and hospital experiences through collaborative networks among professionals, ensuring continuity and fluidity of care pathways rather than fragmentation. Within this integrated context, the midwife assumes the role of case manager, acting as the primary professional reference for women throughout their life course and coordinating multidisciplinary care to address bio-psycho-social needs.

Scientific Evidence and Quantitative Outcomes

Recent literature provides robust empirical support for the midwifery-led care model in low-risk pregnancies. The updated Cochrane Review by Sandall et al.[3], which included 17 randomised trials and 18,533 women, found that midwife continuity of care models, compared with other models of care, likely increase spontaneous vaginal birth from 66% to 70% (RR 1.05; 95% CI 1.03–1.07; moderate-certainty evidence) and likely reduce caesarean section rates from 16% to 15% (RR 0.91; 95% CI 0.84–0.99; moderate-certainty evidence). Women receiving midwife con-

tinuity of care models also reported lower rates of instrumental birth and more positive birth experiences.

The meta-analysis by Sriram et al.[2], which pooled 44 studies for a total of 1,397,320 women, confirms and extends these findings: midwife-led care for low-risk pregnancies is associated with lower risks of unplanned caesarean section, instrumental vaginal delivery, labour augmentation, epidural/spinal analgesia, episiotomy, and active management of the third stage. Shorter hospital stays and lower rates of infection, manual placental removal, blood transfusion, and intensive care admission are also reported, without compromising neonatal outcomes.

Of public-health relevance is the impact of community-based midwifery continuity of care on socially disadvantaged populations, where it may substantially reduce preterm birth and contribute to narrowing perinatal inequalities[3,8].

Limitations, Conflicting Evidence, and Implementation Considerations

A balanced reading of the literature also requires consideration of less favourable evidence. The retrospective cohort study by Wernham et al.[1], conducted in New Zealand on 244,047 pregnancies, reported a higher frequency of selected adverse neonatal outcomes in the midwife-led care group compared with the medical-led group: 5-minute Apgar score <7 (OR 0.52; 95% CI 0.43–0.64 favouring the medical-led group), birth-related asphyxia (OR 0.45; 95% CI 0.32–0.62), and neonatal encephalopathy (OR 0.61; 95% CI 0.38–0.97).

These results should be interpreted with caution in light of important methodological and contextual limitations: the retrospective design, the risk of residual confounding, and the New Zealand maternity system, which is characterised by particularly extensive midwifery autonomy and referral patterns that differ from those in many European settings. The accompanying editorial cautions against generalising these findings, noting that pooled evidence supports the efficacy and safety of midwife-led care when integrated within systems with clear risk-stratification criteria and timely transfer protocols.

The key implication is the need for context-specific implementation, supported by:

- explicit and shared risk-stratification criteria for entry into and continuation within the LOR pathway;
- formal, timely transfer protocols when risk factors or complications emerge;
- structural integration with hospital care and with interdisciplinary teams (obstetric, anaesthetic, neonatal, psychological, social, other medical specialists);
- sustainable organisational models in terms of on-call arrangements and workload, with dedicated attention to the prevention of professional burnout;
- adequate financing and governance, with process and outcome indicators monitored over time.

The literature highlights that the effectiveness of the LOR model depends not only on the model itself, but on the organisational, professional, and cultural conditions in which it is implemented[3,9]. Inter-professional resistance, workforce shortages, heterogeneous training, and the absence of clear transfer pathways are among the main obstacles to its sustainability and replicability.

WHO Recommendations for Intrapartum Care

The recommendations issued by the World Health Organization (WHO) for a positive childbirth experience[5] and WHO Labour Care Guide User's Manual[10], provide the international reference for midwifery practice in intrapartum care in low-risk pregnancies. Table 1 summarises the key recommendations relevant to the LOR model.

Table 1. Summary of selected WHO recommendations (2018–2020) relevant to intrapartum care in low-risk pregnancies. Adapted from WHO recommendations[5,10].

Intrapartum practice	WHO 2018 - 2020 Recommendation (low-risk pregnancies)
Vaginal examination	Vaginal examination every 4 hours during the active phase is recommended, unless otherwise clinically indicated
Fetal monitoring	Intermittent auscultation of fetal heart rate is recommended; routine continuous CTG not recommended in low-risk labour
Partogram	Use of a partogram for labour surveillance is recommended (4-hour action line)
Mobility and position	Mobility and choice of birthing position recommended; upright positions in the second stage support physiology
Continuous support	Continuous one-to-one support during labour is recommended for all women
Episiotomy	Routine use is not recommended; only on selected clinical indication
Oxytocin augmentation	Routine augmentation to accelerate labour is not recommended in the absence of dystocia
Cord clamping	Delayed cord clamping (≥1 minute) recommended to improve neonatal outcomes
Skin-to-skin contact	Immediate, uninterrupted skin-to-skin contact between mother and newborn for at least the first hour after birth is recommended
Respectful maternity care	Respectful maternity care – which refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth is recommended
Effective communication	Effective communication between maternity care providers and women in labour, using simple and culturally acceptable methods is recommended
Companionship	A companion of choice is recommended for all women throughout labour and childbirth
Continuity of care	Midwife-led continuity-of-care models, in which a known midwife or small group of midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended in settings with well-functioning midwifery programmes

The WHO recommendations for a positive childbirth experience[5], together with the WHO Labour Care Guide User's Manual[10], introduce a paradigmatic shift in maternity care, highlighting the value of a positive birth experience and providing recommendations not only on clinical and care-related aspects but also on the professional behaviours required.

Consistent application of these recommendations within the LOR model translates the principle of safeguarding physiology into concrete clinical practices, reducing unnecessary interventions and promoting a positive and respectful childbirth experience.

Midwifery Care During Labour with Epidural Analgesia

The midwife's role as case manager remains relevant even in non-physiological conditions, such as labour with epidural analgesia – one of the most effective techniques for pain relief and widely used in hospital settings[11]. Antenatal psychological variables, including anxiety, fear of childbirth, and maternal–fetal attachment, can significantly influence women's analgesic preferences[12].

International guidelines converge on the principle that, in the absence of medical contraindications, maternal request itself constitutes a sufficient indication for labour analgesia[13,14]. This principle underscores women's right to effective pain relief and requires healthcare organisations to ensure equitable access to labour analgesia across all maternity settings.

The widespread use of epidural analgesia has partially modified care dynamics, requiring an adaptation of the midwife's role, which nevertheless remains central in ensuring holistic care. Epidural analgesia must not reduce childbirth to a purely technical act: the midwife preserves the centrality of the woman, promotes early mother–infant contact, and supports postpartum physiology[5], ensuring personalised and respectful care.

Midwifery support begins in the antenatal period, through structured information about benefits, limitations, and potential side effects of epidural analgesia[14]. Antenatal discussion enables the woman to make an informed choice and to prepare emotionally, reducing anticipatory anxiety and improving overall satisfaction[15].

Continuous one-to-one support during labour is a well-established recommendation also for women receiving epidural analgesia: the presence of a trained caregiver reduces the use of additional pharmacological interventions, improves perinatal outcomes, and enhances women's reported experience[5,16]. During the procedure, midwives collaborate with anaesthesiologists within a multidisciplinary team, ensuring safety, postural assistance, and continuous monitoring of maternal and fetal well-being[17], and act as communicative mediators between the woman, the healthcare team, and the partner/caregiver, fostering trust.

The emotional impact of epidural analgesia depends largely on subjective and contextual variables – expectations, professional support, and cultural background. It is therefore essential to promote care models that integrate clinical aspects with emotional, physical, environmental, communicative, and relational support, ensuring one-to-one care and a positive, respectful, woman-centred birth experience for all women.

The Midwife of the Third Millennium and the New Paradigm in Birth Care

The role of the midwife has evolved significantly in recent decades. Once limited to childbirth assistance, it now encompasses a complex integration of clinical, relational, and organisational competencies. The modern midwife promotes key public-health pillars: enhancement of physiology, women's empowerment, continuity of care, and reduction of unnecessary medicalisation.

Contemporary midwifery-led care is embedded in a healthcare system oriented toward prevention and health promotion, requiring increased attention to women's rights and personalised care pathways. The midwife plays a pivotal role, providing emotional, informational, and clinical support.

As highlighted by the WHO[5], the transition toward midwifery-led care models involves moving from fragmented, risk-based systems to equitable, respectful, and person-centred care. In these models, midwives provide continuous care from conception through the first two years of life, supporting quality and safety[5].

Current healthcare systems still tend to interpret childbirth through a technocratic model characterised by urgency, control, and intervention. While this approach has improved safety, it has also led to excessive medicalisation, sometimes without clear clinical benefits, risking the loss of the human and experiential dimensions of childbirth. A new paradigm is therefore needed – one that places trust in physiological processes at its core, respects natural timing, and values the relationship between women and healthcare professionals. This paradigm is grounded in empathy, active listening, and continuity of care.

Within this framework, midwives are well positioned to promote the humanisation of childbirth. Their continuous presence has been associated with reduced invasive interventions, improved pain perception, shorter labour duration, and improved maternal and neonatal outcomes. Furthermore, fostering empowerment and informed choice strengthens women's autonomy and contributes to a culture of respectful maternity care.

The social dimension of midwifery is equally important. Beyond clinical care, midwives foster partnerships with women, promote community health, and support families in building networks of solidarity and mutual aid (community midwifery). They guide women through physical and emotional changes, helping them develop personalised strategies for pregnancy, childbirth, breastfeeding, and parenting. This paradigm shift is, therefore, not only clinical but also cultural and organisational: it requires a broader understanding of health that emphasises prevention, relationships, and respect for individual experiences.

Continuing Education, Professional Development, Research, and Innovation in Midwifery

The evolution of midwifery requires continuous professional development. Training should not be limited to technical and scientific knowledge but must also include relational, communicative, and ethical competencies, which are essential for person-centred care.

Multidisciplinary education enhances collaboration with other healthcare professionals, strengthens continuity of care, and supports innovative organisational models. Recognising midwives'

autonomy in clinical decision-making is crucial for modernising healthcare systems.

Continuous education tools should include clinical simulation, applied research, and mentoring programmes between senior and junior professionals. These approaches enhance practical skills, update methodologies, and strengthen soft skills and ethical awareness.

Scientific research is a cornerstone of midwifery advancement. Clinical, epidemiological, and organisational studies enable the development of evidence-based protocols, optimisation of resources, and improved safety for women and newborns. Midwives should actively participate in research both as critical consumers of scientific literature and as producers of new knowledge. Evidence-based practice promotes high standards of care and organisational innovation.

Artificial Intelligence and Technological Innovation in Midwifery Care

Emerging technologies, including artificial intelligence (AI), are beginning to find applications in obstetric and perinatal care. Among the most documented areas of development are decision-support systems for cardiotocography (AI-driven CTG), recently the subject of qualitative and clinical studies that assess their reliability and acceptance among midwives and perinatal specialists[18]; predictive algorithms for risk stratification of preterm birth, preeclampsia, and gestational diabetes; and telemedicine applications for community follow-up and perinatal education.

A recent systematic review[19] documents the rapid expansion of AI and machine-learning applications in obstetrics and midwifery, with particular attention to fetal monitoring, diagnostic imaging support, and prediction of adverse outcomes. These tools can support data-driven clinical decisions but cannot replace the human relationship, empathy, and support that characterise midwifery care. Innovation must therefore be integrated critically and ethically, taking into account the risk of excessive epistemic reliance, dataset bias, algorithmic transparency, and the protection of women's privacy[18].

A further area of research concerns the evaluation of the impact of health policies on maternal and child health. Longitudinal and comparative studies can identify best practices and guide resource allocation toward more equitable and efficient systems.

Conclusions

The midwife of the third millennium is a key figure in the future of maternal and child health. By integrating clinical, scientific, and relational competencies, midwives promote personalised, safe, and sustainable care pathways centred on physiology, continuity of care, and women's autonomy. Strengthening midwifery-led models of care should, therefore, be considered a strategic priority for improving maternal and neonatal outcomes and reducing health inequalities. Current evidence supports the effectiveness of continuity of care models for low-risk pregnancies, showing reduced unnecessary interventions and improved birth outcomes. At the same time, the safety and sustainability of these models depend on appropriate organisational conditions, including clear risk assessment, interdisciplinary collaboration, timely referral pathways, and support for professional well-being. Strengthening maternity services will require sustained investment in education, research, leadership, and innovation. The future of the LOR model depends not only

on clinical effectiveness, but also on the ability of healthcare systems to promote respectful, humanised, and woman-centred care that safeguards physiology, dignity, autonomy, and community well-being.

Declarations

Artificial Intelligence (AI) – Assisted Technology Statement

In preparing this manuscript, the authors used AI tools to support language editing and bibliographic organisation. The authors take full responsibility for the scientific content, interpretation of the evidence, and conclusions presented in the manuscript.

Authors' Contributions

Gabriella Gentile: conception and drafting of the manuscript; Anna Domenica Mignuoli: critical literature review; Angela Maccagnola: final revision and supervision. All authors read and approved the final version of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest to disclose in relation to this work.

Data Availability Statement

Not applicable. No original datasets were generated or analysed in this study.

Ethics Approval

Ethics committee approval was not required for this manuscript.

Funding

No funding was declared for this work.

Informed Consent

Not applicable. The manuscript does not contain identifiable details or case reports.

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