




## REVIEW ARTICLE

# Skin-to-skin contact after birth: Developing a research and practice guideline

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## Abstract

**Aim:** Skin-to-skin contact immediately after birth is recognised as an evidence-based best practice and an acknowledged contributor to improved short- and long-term health outcomes including decreased infant mortality. However, the implementation and definition of skin-to-skin contact is inconsistent in both practice and research studies. This project utilised the World Health Organization guideline process to clarify best practice and improve the consistency of application.

**Abbreviations:** BFHI, Baby Friendly Hospital Initiative; BMI, Body mass index; DNP, Doctorate of Nursing Practice (credential); EENC, Early Essential Newborn Care; GRADE, Grading of Recommendations Assessment, Development and Evaluation; JD, Juris Doctor (credential); MD, Medical Doctor (credential); NGO, Non-Governmental Agency; NICU, Neonatal Intensive Care Unit; PhD, Doctor of Philosophy (credential); RCT, randomised controlled trials; SCC, Skin-to-skin contact; SUID, sudden unexpected infant death; UNICEF, United Nations Children's Fund; WHO, World Health Organization.

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**Methods:** The rigorous guideline development process combines a systematic review with acumen and judgement of experts with a wide range of credentials and experience.

**Results:** The developed guideline received a *strong recommendation* from the Expert Panel. The result concluded that there was a high level of confidence in the evidence and that the practice is not resource intensive. Research gaps were identified and areas for continued work were delineated.

**Conclusion:** The World Health Organization guideline development process reached the conclusion immediate, continuous, uninterrupted skin-to-skin contact should be the standard of care for all mothers and all babies (from 1000 g with experienced staff if assistance is needed), after all modes of birth. Delaying non-essential routine care in favour of uninterrupted skin-to-skin contact after birth has been shown to be safe and allows for the progression of newborns through their instinctive behaviours.

#### KEYWORDS

best practice, breastfeeding, guideline development, implementation, skin-to-skin

## 1 | INTRODUCTION

Considered the father of attachment theory, John Bowlby confronted the prevailing medical and psychiatric belief of his time: that a baby's needs consist only of being fed and kept dry and warm. Instead, he posited that early relationships should be warm, intimate and continuous. Bowlby's theory challenged long-held directives to parents such as warnings that picking up and soothing crying babies spoils them.<sup>1</sup> Widely disseminated and influential, Bowlby's World Health Organization report<sup>2</sup> as well as later papers postulated that beyond abuse and neglect, separation of baby and mother, or permanent caregiver, could have both short- and long-term mental health consequences.

Bowlby's colleague Mary Ainsworth brought attachment theory to a more empirical level by developing a cultural research method, the 'strange situation' procedure,<sup>3</sup> and through direct observation of family interaction in home settings.<sup>4</sup> This pioneering work contributed to the idea that attachment was complex with both universal and individual characteristics and could be compromised by behaviours other than those caused by long-term separations due to hospitalisation or institutionalisation.

Influenced by Bowlby and Ainsworth's theories as well as Lorenz's gosling imprinting work,<sup>5,6</sup> Kennell and Klaus called for changes in birth practices. They promulgated the idea that bonding between mother and newborn could happen during the first moments and hours after birth.<sup>7</sup> Early researchers of skin-to-skin contact in the first hour based their work on Bowlby and Ainsworth's attachment theories.<sup>8-14</sup>

Aggregated evidence continues to substantiate and enlarge upon the findings of the early attachment researchers. Skin-to-skin contact has been shown to positively influence maternal-infant interaction 1 year later,<sup>11,15</sup> increase bonding and attachment behaviours,<sup>16-19</sup>

#### Key notes

- Although skin-to-skin contact after birth is an evidence-based best practice and acknowledged contributor to improved health outcomes, implementation and definition is demonstrably inconsistent in practice and research.
- The WHO guideline development process was utilised to produce a comprehensive international skin-to-skin guideline for the first hour after birth, receiving a 'strong recommendation' from the Expert Panel.
- Appendix S1, *A Pragmatic Implementation Guide*, provides step-by-step implementation instructions according to the guideline.

increase maternal caretaking behaviours,<sup>20</sup> maternal interpretation of the infant's signals.<sup>21</sup> Maternal self-confidence<sup>22</sup> and the experience of giving birth are enhanced by skin-to-skin contact.<sup>23-26</sup> Some studies have examined skin-to-skin contact in the context of packages of maternal/neonatal care practices such as the World Health Organisation (WHO)'s Early Essential Newborn Care (EENC)<sup>27,28</sup> and the WHO and United Nations Children's Fund (UNICEF) Baby Friendly Hospital Initiative (BFHI)<sup>29</sup> rather than as a singular intervention. In these cases, it may be difficult to tease apart the impact of individual interventions such as skin-to-skin contact from the impact of the 'whole package' of care interventions.

Research indicates that skin-to-skin contact for the first hour after birth relieves post-traumatic stress in women who have had challenging birth experiences,<sup>30</sup> decreases the risk of early maternal depression and bonding problems,<sup>31</sup> and decreasing maternal

anxiety.<sup>32</sup> A systematic review reported that in the case of immediate, intraoperative skin-to-skin contact, maternal stress levels were reduced, whereas comfort, oxytocin and antioxidant levels increased.<sup>33</sup>

The safety of skin-to-skin contact immediately after birth has been questioned.<sup>34,35</sup> However, systematic reviews and randomised controlled trials (RCT) have concluded that skin-to-skin contact is safe. For example, the widespread implementation of skin-to-skin contact over time was found to be associated with a contemporaneous decrease in the risk of sudden unexpected infant death (SUID) within 6 days of birth.<sup>36</sup> An RCT which randomised more than 3000 infants with birth weights between 1.0 and 1.799 kg found that the intervention group (placed skin-to-skin immediately after birth, prior to stabilisation and then continue in kangaroo care) had lower mortality at 28 days than those who received conventional care. In fact, 'the trial was stopped early on the recommendation of the data and safety monitoring board owing to the finding of reduced mortality among infants receiving immediate kangaroo mother care'.<sup>37</sup> SCC has also been shown to decrease hospital admission<sup>38</sup> and transfer of newborns to the NICU.<sup>39-42</sup>

Neonatal transition to extrauterine life with and without skin-to-skin contact has also been studied with babies from 25+ weeks and 1000+ g. As measured by parameters such as temperature, blood glucose levels and oxygen saturation, research examining full-term infants' transition to extrauterine life has shown that skin-to-skin contact is safe and the optimal choice for the habitat of the newborn.<sup>21,38,43-48</sup> Prematurely born infants, as well as those born with low birth weight, transition well in skin-to-skin contact.<sup>49-53</sup> Even in cases of operative birth, immediate skin-to-skin contact supports the safe transition of the newborn.<sup>54-56</sup>

One of the physical aspects of skin-to-skin contact pertaining to maternal outcomes is the duration of the third stage of labour (the time to expel the placenta). Well-done individual studies indicate that skin-to-skin contact decreases the duration of the third stage<sup>22,47,57-59</sup> as does a systematic review.<sup>60</sup> Pain during episiotomy repair<sup>61</sup> and postpartum use of synthetic oxytocin<sup>57,58</sup> have also been found to be lessened by skin-to-skin contact. Measurements of operative time and blood loss showed no ill effects from skin-to-skin contact<sup>62</sup> and maternal plasma haemoglobin levels at discharge were significantly higher.<sup>63</sup> When combined with EENC both the duration of the third stage of labour and blood loss have been shown to decrease.<sup>32</sup>

A 2003 systematic review of 7 RCTs which evaluated the effect of mother/baby skin-to-skin care on successful breastfeeding reported that the evidence 'failed to support the current initiatives to implement changes in clinical practice to include skin-to-skin contact'.<sup>64</sup> However, a later review, published by the Cochrane Database of Systematic Reviews, included 38 studies and reported that 'the evidence from this updated review supports using immediate or early SSC (skin-to-skin contact) to promote breastfeeding'.<sup>65</sup> Recent systematic reviews and meta-analyses have found positive correlations between skin-to-skin contact in the first hour and the success and duration of the first breastfeed<sup>66</sup> as well as the likelihood of exclusive

breastfeeding for 3–6 months.<sup>67</sup> The effect of skin-to-skin contact on the infant's sucking behaviour has also been studied and was found to positively influence latching and sucking behaviours.<sup>13,68,69</sup> Skin-to-skin contact has been found to enhance maternal breastfeeding self-efficacy,<sup>22,70</sup> self-confidence<sup>21</sup> as well as the positive maternal perception of breastfeeding.<sup>71</sup> Some studies have examined breastfeeding outcomes and skin-to-skin contact in the context of EENC<sup>32</sup> or the BFHI<sup>72</sup> rather than as a singular intervention. Research indicates that skin-to-skin contact allows for the newborn to progress through Widström's 9 stages, a sequence of instinctive behaviours that increase the possibility of self-attachment and suckling in the first hours after birth.<sup>21,69,73-77</sup>

Holding the newborn in skin-to-skin contact immediately after birth and continuing without interruptions for the first hour or more is now recognised as more than simply physical contact at the beginning of a new life—it is also the start of the psychosocial attachment process and the optimal physical transition mechanism for the newborn and mother. However, research studies<sup>65,78</sup> as well as observations of practice<sup>73</sup> and interviews with staff<sup>79</sup> indicate that the concept and practice of skin-to-skin contact can have a plethora of meanings and interpretations. The inclusion criteria of participants as well as the timing and dosage of contact confound the comparison of clinical trials.<sup>65</sup> This lack of precision is ironic considering that separation of mother and baby may be responsible for negative long- and short-term mental health effects as well as physical effects for both mother and baby as averred in recent research.

Although major WHO and UNICEF initiatives such as the Baby-Friendly Hospital Initiative and WHO Recommendations Intrapartum Care for a Positive Birth Experience call for skin-to-skin contact, no guideline has been developed. The aim of this work was to utilise the WHO Handbook for Guideline Development to elucidate a clear, implementable, evidence-based guideline for both research and practice.<sup>80</sup>

## 2 | METHODS

The Skin-to-Skin Clinical Guidelines Development Project used an accepted process, the WHO Handbook for Guideline Development, in order to navigate the task of guideline development.<sup>80</sup> The steps included choosing a theme, setting up a Steering Group, tasked with conducting a systematic review including the bibliographic search, the critical appraisal and methodological synthesis and composing a draft guideline. The guideline External Panel met to deliberate and achieve consensus on the guideline and make a final recommendation. Scientific monitoring is expected to occur at least every 3 years.

### 2.1 | Purpose

This guideline is intended to provide evidence-based recommendations to inform researchers, practitioners and policy-developers as they create and evaluated health policies and procedures related

to skin-to-skin contact between the mother and newborn in the first hours after birth in any setting. Key questions addressed 'who' practices skin-to-skin in the first hour after birth; 'what' is the definition of skin-to-skin contact in the first hour after birth, 'where' should skin-to-skin contact take place; 'how' has skin-to-skin been implemented; 'why' is skin-to-skin practiced and researched; 'when' should skin-to-skin happen in time.

## 2.2 | Systematic review

The international and interdisciplinary Steering Group, tasked with the draft systematic review, consisted of KB, KC, KS, CTM, AB and JS. Additional support was provided by JG and LB.

## 2.3 | Target audience

The target audience is public or private healthcare policy-makers, administrators, managers, researchers, educators and practitioners who study, work with and support childbearing families.

## 2.4 | Evidence review

The bibliographic search was conducted with no limits during 2021. Initially, 55 893 records were identified in 11 databases, and a further 136 were identified through other sources, including hand searches and suggestions from colleagues. After removing duplicates and records that were not applicable to the topic, 369 remained. The PRISM diagram is available in [Figure 1](#).

The remaining papers were then reviewed and excluded if:

- Skin-to-skin contact was not provided within the first hour after birth.
- There was no definition of skin-to-skin contact in the article.
- It was a protocol, thesis, conference abstract or prevalence study.
- The study was poorly conducted or poorly described.
- No full text of the article was accessible.
- There was no full-text English version of the article.

The systematic review team then concentrated on an in-depth review of the remaining 137 papers and assessed them using consensus to agree on inclusion/exclusion. The quantitative papers were evaluated using the Institute of Medicine Clinical Practice Guidelines.<sup>81</sup> The qualitative and mixed methods papers were evaluated using the JBI Levels of Evidence for Meaningfulness.<sup>82</sup>

## 2.5 | Guideline development process

A guideline draft was developed following a critical appraisal and methodological synthesis of the evidence and sent it out for external

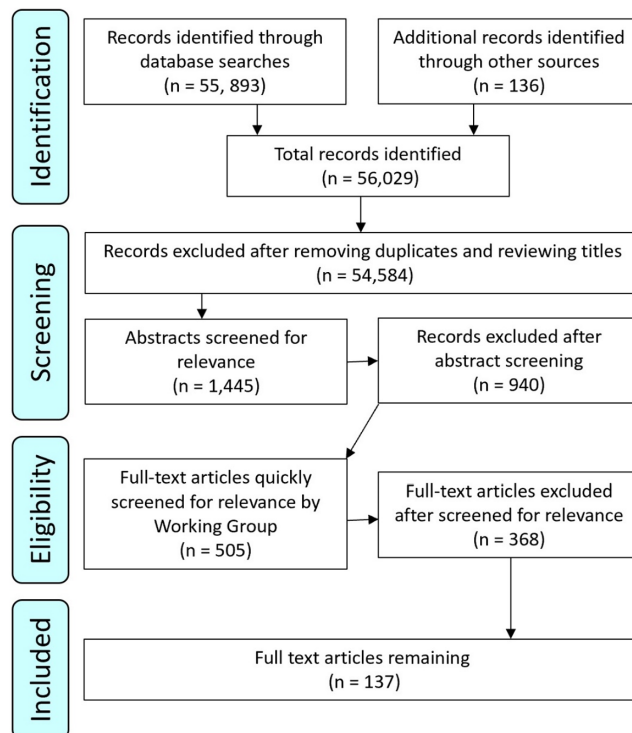


FIGURE 1 The PRISM diagram of the systematic review.

review to the Expert Panel members. Feedback was solicited, and the draft was edited incorporating the suggestions received before the Expert Panel met face-to-face from 28 October to 31 October 2022. The Expert Panel included the Steering Group (KB, KC, KS, CTM, AB, JS, JG and LB) plus External Panel Members RS, JTC, WJ, UE, RM, YT, AA, EG, RH, SL, MK and ES. The Expert Panel consisted of members from 11 countries with practice and research expertise in diverse settings including neonatal units and along the birth and community childbearing timeline. Credentials included MDs, PhDs, a JD and DNPs. Panellists worked as obstetricians, midwives, nurses, neonatologists, public health, doulas, nutritionists, anthropologists as well as lactation care providers, university faculty and researchers.

The Expert Panel meeting included both small and large group discussions. Members reviewed the foundational research provided by the systematic review team in small groups and came to a consensus recommendation of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) designation of the quality of evidence: A, high; B, moderate; C, low, D, very low.<sup>80</sup> Large group discussions followed which ensured that each section of the guideline was worded optimally and that there was agreement on the overall level of evidence. This was done for each key question.

After the meeting adjourned, the guideline was circulated to each member of the Expert Panel, who then reviewed the entire guideline and provided feedback.

The finalised guideline was rewritten according to journal requirements to facilitate publication and diffusion. The guideline was again shared with the Expert Panel members for review. To remain

current, the guideline will be reviewed at least every 3 years, with urgent reviews occurring as appropriate.

### 3 | RESULTS

**Table 1** summarises the guideline recommendations. **Table 2** summarises the GRADE for the full recommendation. **Table 3** summarises the GRADE-recognised research gaps. The elements in the guidelines are.

- All Mothers
  - Skin-to-skin contact at birth is appropriate for all mothers throughout the world (Table S1 in Appendix S2).
- All Babies
  - Skin-to-skin contact at birth is appropriate for all babies throughout the world (Table S2 in Appendix S2).
- Immediate
  - Immediately after birth, the baby should be placed directly onto the mother's bare chest/abdomen, before the cord is clamped (Table S3 in Appendix S2).
- Skin-to-Skin Contact
  - The naked newborn baby should be placed prone on the mother's naked chest/abdomen (Table S4 in Appendix S2).
- All Births
  - Skin-to-skin contact is appropriate after all modes of birth (Table S5 in Appendix S2).
- Uninterrupted
  - The baby and mother should be allowed a peaceful time during skin-to-skin contact, observed but undisturbed by family or staff (Table S6 in Appendix S2).

**TABLE 1** The individual aspects of the guideline received rated recommendations from the Expert Panel meeting.

Guideline recommendation	Rating
All mothers	A
All babies	A
Immediately after birth	A
Skin-to-skin contact	A
All births	A
Postpone routine care	A
Uninterrupted	B
Continuous	A
Safe	A
Instinctive behaviour	B

Note: An 'A' rating indicated that 'At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population, and demonstrating consistency of results'; A 'B' rating means 'A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+'.<sup>81</sup>

- Postpone Routine Care
  - Routine care such as weighing, eye care and screenings can be postponed safely for the first hour. Necessary care that can be done while on the mother's body, such as assessment of vital signs and Apgar scoring, should be conducted during skin-to-skin contact (Table S7 in Appendix S2).
- Continuous
  - The naked baby remains skin-to-skin on the mother's bare chest/abdomen. The baby should not be removed for routine care or transfer to another bed or ward (Table S8 in Appendix S2).
- Safe
  - Skin-to-skin contact is safe and improves outcomes for mother and baby (Table S9 in Appendix S2).
- Instinctive Behaviour of the newborn
  - Infant should be given the opportunity to progress through their instinctive behavioural stages: the birth cry, relaxation, awakening, activity, rest, crawling, familiarisation, breastfeeding and sleeping (Table S10 in Appendix S2).

#### 3.1 | GRADE

The World Health Organization Handbook for Guideline Development<sup>80</sup> provides the process for assigning a Grade for the overall strength of a recommendation—either strong or conditional. The decisions of the External Panel are documented in **Tables 2** and **3**. The GRADE assigned was a 'strong recommendation' for all mothers and all babies to have immediate skin-to-skin contact after birth that is safe, postpones routine care, is uninterrupted and continuous allowing progression through their instinctive behaviours. Research gaps are described.

### 4 | DISCUSSION

The need for guideline development emanated from the recognition that although skin-to-skin contact in the first hour after birth is recommended in WHO and UNICEF documents, no guideline exists. In addition, there is a lack of homogeneity in the research and practice of skin-to-skin contact after birth. Specifically, there is no universally recognised definition of the procedure of skin-to-skin contact after birth. The guideline development process included a systematic review, critical appraisal and methodological synthesis of the evidence and Expert Panel participants from every continent except Antarctica. The Expert Panel strongly recommends the guideline, which specifies that all mothers and all babies should have immediate, continuous, uninterrupted skin-to-skin contact regardless of mode of birth. Delaying non-essential routine care in favour of uninterrupted skin-to-skin contact after birth is safe and allows for newborns to progress through their instinctive behaviours.

All mothers deserve skin-to-skin contact immediately after birth. Although age, body mass index (BMI), pre-existing conditions,

TABLE 2 'All mothers and all babies should have immediate skin-to-skin contact after birth that is safe, postpones routine care, is uninterrupted and continuous allowing progression through the newborn's instinctive behaviors'.

Table 8.1 Decision table to support the development of recommendations

Recommendation:		
Population:		
Intervention:		
Factor	Decision	Explanation
Quality of the evidence (The higher the quality of the evidence, the more likely a strong recommendation is warranted.)	High ← Moderate Low Very low	
Balance of benefits versus harms and burdens (The larger the difference between the benefits and harms, the more likely a strong recommendation is warranted. The smaller the net benefit and the lower the certainty for that benefit, the more likely a conditional recommendation is warranted.)	Benefits clearly outweigh harms ← Benefits and harms are balanced Potential harms clearly outweigh potential benefits	
Values and preferences (The greater the variability or uncertainty in values and preferences, the more likely a conditional recommendation is warranted.)	No major variability ← Major variability	
Resource use (The higher the costs of an intervention, that is, the more resources consumed, the more likely a conditional recommendation is warranted.)	Less resource-intensive ← More resource-intensive	
Overall strength of the recommendation: (strong or conditional)		
Research gaps:		

Note: WHO GRADE: strong recommendation. The complete Guideline can be found at [www.skintosinguideline.org](http://www.skintosinguideline.org).

ethnicity, sexual orientation and gender diversity, race, marital status, desire for pregnancy, skin colour, and parity have all been presented in research studies as limiting factors for inclusion in skin-to-skin research studies, other studies have employed no maternal or infant exclusion criteria (Table S1 in Appendix S2). The panel considered the evidence provided by individual studies and systematic reviews. The WHO Immediate KMC Study Group included 'all pregnant women' in the population cohort which included participants from Ghana, India, Malawi, Nigeria and Tanzania.<sup>37</sup> A study in Norway and Sweden included 'women admitted for risk of preterm labor' without additional exclusions.<sup>51</sup> 'All mothers' were included in a multi-national systematic review of skin-to-skin contact.<sup>83</sup>

Skin-to-skin contact immediately after birth should be the standard of care for mothers and babies based on cardiorespiratory stability, from around 1000 g/28 weeks+, with experienced staff present in case assistance, is needed. This should include those with critical congenital heart disease and all high-order multiples (Table S2 in Appendix S2). This practice may be valuable for extremely pre-term infants as well, but it remains a gap in rigorous research. For most babies, care, including initial resuscitation, can be performed while in skin-to-skin contact after appropriate staff training. Skilled and experienced staff are needed for very pre-term infants to

TABLE 3 GRADE comments in the final section—'Research Gaps'.

#### Research gaps

Skin-to-skin contact is often part of a research bundle [e.g. Early Essential Newborn Care (EENC), Baby-Friendly Hospital Initiative (BFHI)]. Although we applaud the inclusion of skin-to-skin contact in these vital bundles, it is difficult to know the specific advantage of the contact versus the early cord clamping, rooming in, etc.

There is a known bias of not publishing articles with limited or negative outcomes. It is unknown how many unpublished research studies may describe the negative or limited implications of skin-to-skin contact

There is limited research that meets all the criteria listed in the recommendation: immediate, continuous, uninterrupted, skin-to-skin contact, post-posting routine care until after the first breastfeeding. Many research articles do not include a clear definition of skin-to-skin contact or an explanation of their interpretation of skin-to-skin contact

There is limited research about immediate skin-to-skin contact for extremely pre-term infants. More research is needed in both high- and low-income countries

There is limited research outside of hospital settings. Skin-to-skin research in different settings, such as home births, emergency/ ambulance, traditional birth, etc.

Although there is research to support postponing routine care of the newborn during the first hour after birth, there is limited research on routine care of the mother during the first hour, which would allow her to focus on the skin-to-skin newborn

Many research studies investigate the first hours, weeks and days, but there are few studies which follow outcomes beyond this time

There is limited data from Randomised Controlled Trials (RCT) examining immediate, continuous skin-to-skin contact that is uninterrupted. An example of current common practice that impacts the success of skin-to-skin contact and breastfeeding is separating the mother and infant after skin-to-skin in the operating theatre in order to transport them individually to the recovery room. It would be helpful to compare the results of keeping the dyad skin-to-skin or separating them for the transfer

There is limited research on the instinctive behaviour of premature infants, especially starting immediately after birth

There is confusion about terminology in research articles, confusing Kangaroo Care (KMC or KC), which is a care model for holding premature infants, with skin-to-skin contact (SSC), which is a procedure which occurs in the first hour(s) after birth. The terms are incorrectly used interchangeably, creating confusion in systematic reviews

ensure a successful transition to spontaneous breathing and timely recognition of Respiratory Distress Syndrome (RDS). It is important to consider the ethics and risk of not receiving immediate, continuous, uninterrupted skin-to-skin contact, especially in the context of the Convention on the Rights of the Child.<sup>84</sup>

Research studies that had been assigned a 1++ level of evidence by the systematic review team included premature infants as small as 1000g+, regardless of gestational age, in Ghana, India, Malawi, Nigeria and Tanzania,<sup>37</sup> 1200–2199g at birth in South

Africa,<sup>49</sup> 1500–2500 g in Vietnam<sup>50</sup> through to full-term infants in systematic reviews of multiple countries.<sup>65,67</sup> Singleton and twin infants 'born vaginally with gestational ages of 32 weeks/0 days to 34 weeks/6 days' in Norway have been included in research<sup>85</sup> and '28+0 to 32+6 gestational weeks' in Sweden and Norway.<sup>51</sup>

The guideline emphasises the importance of immediate skin-to-skin contact after birth. Immediate skin-to-skin contact means that the naked newborn is placed directly onto the mother's bare chest/abdomen immediately after birth, towel dried on the way, before the cord is clamped (Table S3 in Appendix S2). The mother should be in a comfortable position, with support given to her arms and back so she can recline comfortably for at least the first hour after the birth. Optimally, the infant is placed directly into the mother's hands and dried while being brought to the abdomen or chest. The baby should be placed on its abdomen, just below or between the mother's breasts with the head on the mother's chest, to maximise the skin-to-skin contact between the mother and baby. There should be no diversions during this time, such as weighing. A clean dry cloth or towel should be placed over the dyad to prevent hypothermia, diaper and hat are not usually needed. Peer-reviewed articles that studied the importance of immediate contact received a 1++ level of evidence, including studies from Iran,<sup>22</sup> Columbia,<sup>86</sup> Japan,<sup>87</sup> the United States,<sup>88</sup> Sweden,<sup>89,90</sup> and India.<sup>71</sup> Systematic reviews also specified immediate skin-to-skin contact after birth as inclusion criteria.<sup>60,88</sup> The process of skin-to-skin contact is enumerated in Table S4 in Appendix S2.

Modes of birth appropriate for skin-to-skin contact immediately after birth (Table S5 in Appendix S2) include vaginal births, epidural birth, medicated birth, instrument-assisted birth and routine/planned/expected/scheduled caesarean surgeries. Since skin-to-skin care is best practice for full-term<sup>65</sup> and premature infants,<sup>37</sup> more work is needed to ensure that skin-to-skin contact is implemented in all modes of birth, such as emergency caesarean surgery, water births, as well as all births taking place in hospitals, homes, birthing centres and birth before arrival. Numerous peer-reviewed articles that have included a range of modes of birth prior to initiating skin-to-skin received a 1++ level of evidence including vaginal birth<sup>91</sup> and both vaginal and caesarean birth.<sup>37,51,60</sup>

The newborn should be undisturbed during the first hour or so after birth (Table S6 in Appendix S2) and routine care should be conducted while the newborn is skin-to-skin or should be postponed (Table S7 in Appendix S2); allowed a peaceful time to awaken, explore and self-attach. Staff should not move the baby, although directions could be given to the mother to gently rearrange a newborn to ensure free upper airways. The newborn should not be rearranged for reasons of photography or family viewing nor should the newborn be poked or flicked to encourage reactions. Newborns are capable of self-attachment; the latching process should not be assisted. The dyad should not be left alone. The importance of uninterrupted time is emphasised by the level 2 research papers and qualitative research papers, which highlight connection and bonding.<sup>24</sup> The effect of interruption on breastfeeding efficacy has been reported<sup>13</sup>

and the effect of 'interrupted – staff Interfered, interrupted – family interfered' on the instinctive behaviour of the newborn has been documented.<sup>73,75</sup> Numerous peer-reviewed studies which included postponing routine care such as weighing, eye care and screenings during the first hour or two after birth during skin-to-skin contact received a 1++ level of evidence<sup>22,59,91</sup> (Table S8 in Appendix S2). Monitoring, circulatory and respiratory support may be required and optimally can be performed while skin-to-skin. While the newborn is on the mother's body, care which does not interrupt skin-to-skin contacts, such as assessment of vital signs and Apgar scores, can be performed. If the dyad will be moved during this time—to a different room or a different bed—they should remain in continuous skin-to-skin contact. Numerous peer-reviewed articles indicating the specifics of skin-to-skin contact received a 1++ level of evidence with very similar definitions of skin-to-skin including<sup>22,51,58,90–92</sup> (Table S8 in Appendix S2).

Skin-to-skin contact is safe (Table S9 in Appendix S2). However, training is needed to ensure safe positioning, monitoring and oversight. Numerous peer-reviewed articles examining the safety of skin-to-skin contact received a 1++ level of evidence. Bergman et al. highlighted the safety of doing routine care while skin-to-skin: 'Newborn care provided by skin-to-skin contact on the mother's chest results in better physiological outcomes and stability than the same care provided in closed servo-controlled incubators'.<sup>49</sup> Additionally, skin-to-skin contact immediately after birth is associated with improved 'transition to extra-uterine life',<sup>50</sup> 'better thermal regulation in term and nearly term infants'<sup>59</sup> and lower mortality in very low-weight babies.<sup>37</sup> The increase in skin-to-skin care and breastfeeding initiatives in the United States has been temporally associated with decreasing SUID prevalence in the first 6 days after birth.<sup>36</sup>

Randomised controlled trials show that skin-to-skin contact is safer for the mother as well: 'It was observed that 100% of the study group had a contracted uterus immediately after birth, with a complete placenta, no uterine atony or excessive blood loss compared to 60%, 80%, and 72% of the control group'<sup>57</sup> and a systematic review reports 'Mother-infant SSC decreases the duration of third stage of labor. Therefore, the current study provides some evidences to use this non-pharmacological method in order to accelerate the third stage of labor and ultimately prevent postpartum hemorrhage'.<sup>60</sup>

The newborn should be allowed to progress through their instinctive behaviours, including Widström's 9 Stages (Table S10 in Appendix S2). Peer-reviewed articles indicating the importance of uninterrupted time received a 2 level of quantitative evidence or level 1 of qualitative evidence, primarily by emphasising the 9 Stages from around the world, including Sweden,<sup>74,93</sup> Iran,<sup>30</sup> Australia,<sup>73</sup> Japan,<sup>73,74</sup> the United States,<sup>69,74–76,94</sup> Uganda,<sup>21,45</sup> India<sup>95</sup> and China.<sup>96</sup>

The Expert Panel also developed a Pragmatic Implementation Guide for Skin-to-Skin Contact after Birth, based on the evidence, to promote and enable consistent implementation of the guideline (Appendix S1).

## 5 | CONCLUSION

The Cochrane Review of skin-to-skin contact and breastfeeding outcomes highlights the need for a skin-to-skin guideline due to the lack of homogeneity in the body of research related to skin-to-skin contact after birth. Skin-to-skin contact 'was defined in various ways and different scales and times were used to measure different outcomes'.<sup>65</sup> By utilising the WHO guideline development processes,<sup>80</sup> the goals of critically appraising and synthesising the literature, defining the practice of skin-to-skin contact after birth and elucidating research gaps have been achieved. After reviewing the high quality of the evidence, concluding that the benefits clearly outweigh the harms, that the results were unconditional and that skin-to-skin after birth is appropriate in both high and low resource settings, the Expert Panel assigned a 'strong recommendation' for guideline adoption.

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### CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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