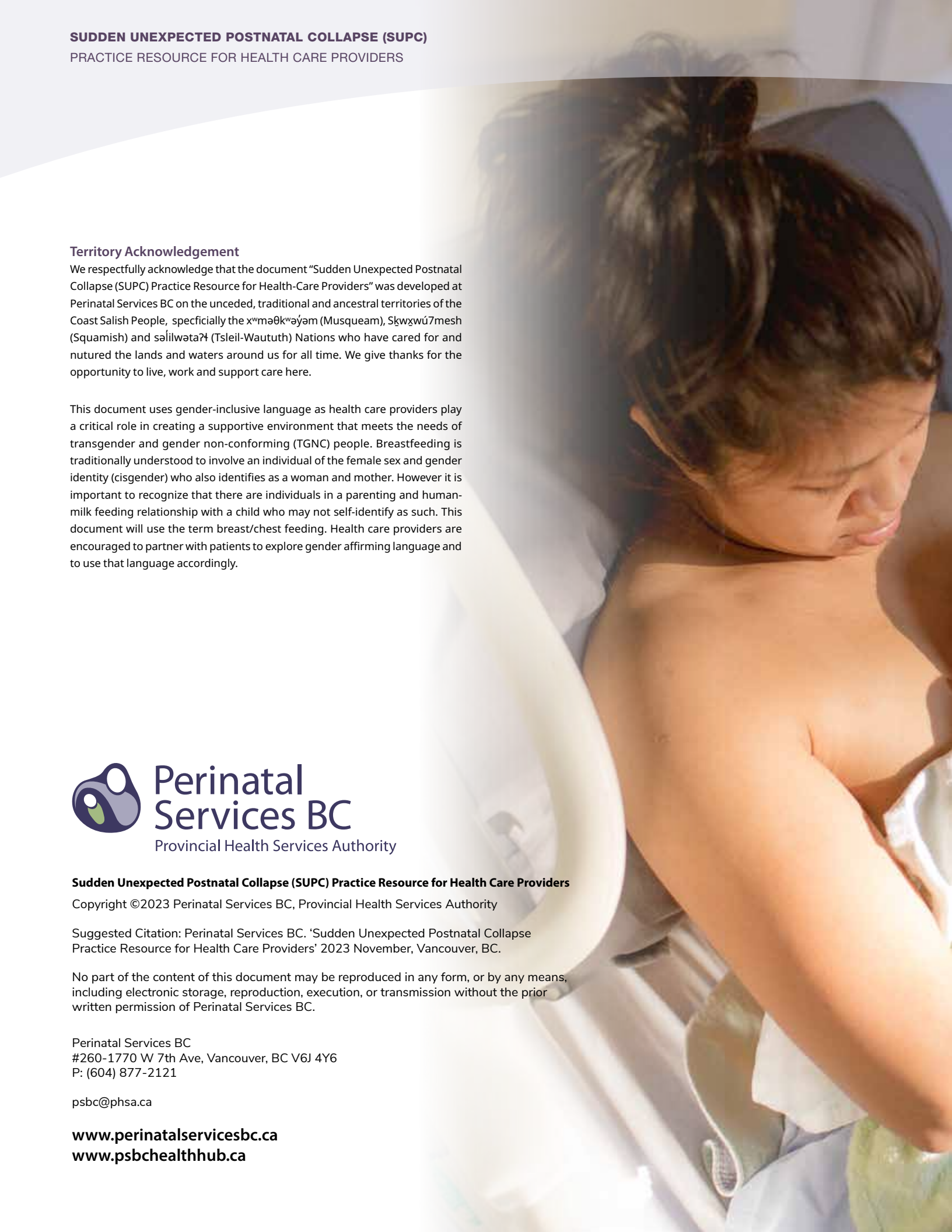
Sudden Unexpected Postnatal Collapse (SUPC)

Practice Resource for Health Care Providers

November 2023

Perinatal Services BC
Provincial Health Services Authority



Territory Acknowledgement

We respectfully acknowledge that the document "Sudden Unexpected Postnatal Collapse (SUPC) Practice Resource for Health-Care Providers" was developed at Perinatal Services BC on the unceded, traditional and ancestral territories of the Coast Salish People, specficially the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish) and səl̓ilwətaʔɬ (Tsleil-Waututh) Nations who have cared for and nutured the lands and waters around us for all time. We give thanks for the opportunity to live, work and support care here.

This document uses gender-inclusive language as health care providers play a critical role in creating a supportive environment that meets the needs of transgender and gender non-conforming (TGNC) people. Breastfeeding is traditionally understood to involve an individual of the female sex and gender identity (cisgender) who also identifies as a woman and mother. However it is important to recognize that there are individuals in a parenting and human-milk feeding relationship with a child who may not self-identify as such. This document will use the term breast/chest feeding. Health care providers are encouraged to partner with patients to explore gender affirming language and to use that language accordingly.

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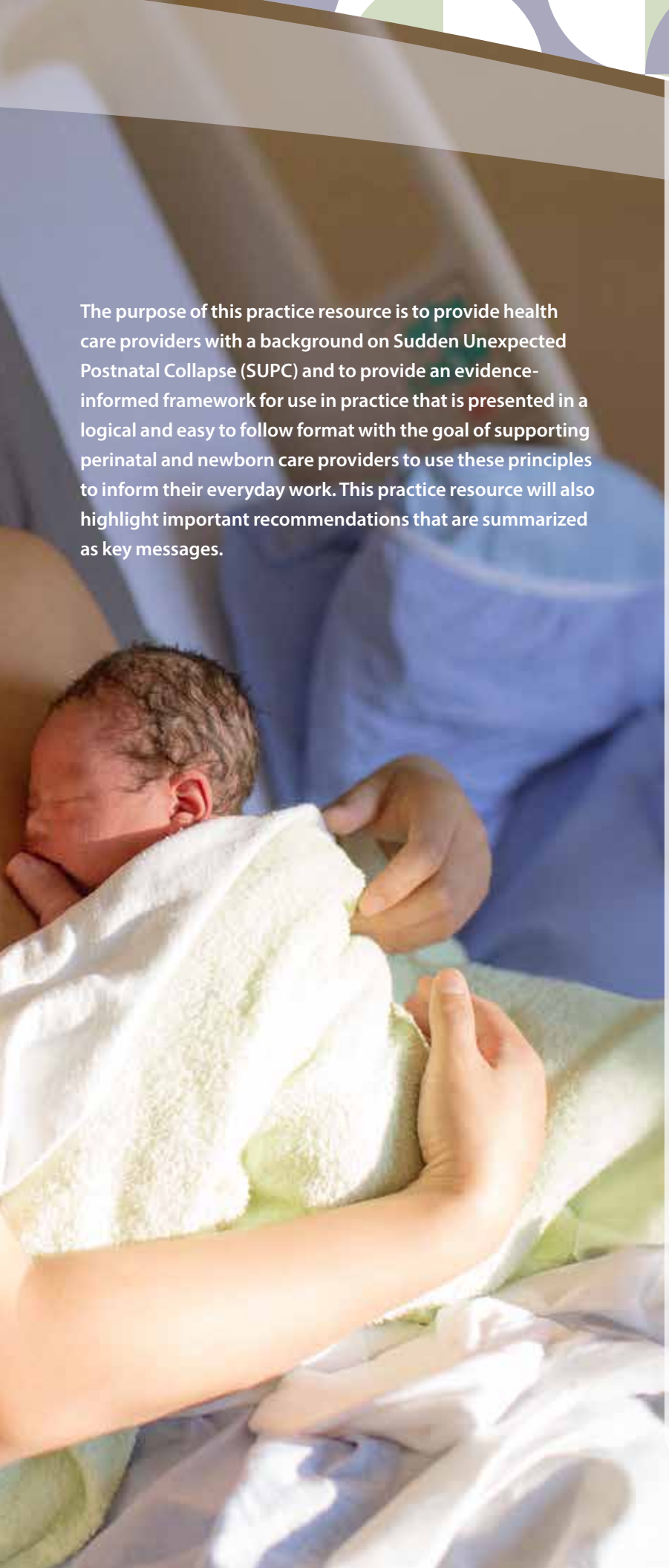

The purpose of this practice resource is to provide health care providers with a background on Sudden Unexpected Postnatal Collapse (SUPC) and to provide an evidence-informed framework for use in practice that is presented in a logical and easy to follow format with the goal of supporting perinatal and newborn care providers to use these principles to inform their everyday work. This practice resource will also highlight important recommendations that are summarized as key messages.

Key Messages Summary

- Sudden Unexpected Postnatal Collapse (SUPC) occurs in term or late preterm infants (≥ 35 weeks) who are well at birth (with a 5 minute Apgar score ≥ 7 and considered well enough to receive routine newborn care) and who experience an unexpected cardio-respiratory collapse within the first seven days after birth.

- SUPC is possibly preventable, and as such, it is important to identify modifiable risk factors and increase protective counter-measures where non-modifiable risk factors exist.

- Increased surveillance by health care professionals during the first hours and days of life may decrease the risk of SUPC while promoting bonding between the newborn and the mother/person and establishing successful breast/chest feeding.

- Provide parent(s)/caregiver(s) with education on safe skin-to-skin practices, infant feeding, and safer sleeping practices focusing on modifiable risk factors such as infant airway positioning and close observation of infant colour, tone, and breathing.

- Initiate appropriate resuscitation measures in the event of SUPC.

Background

Sudden Unexpected Postnatal Collapse (SUPC) is a rare, possibly preventable, and potentially fatal event. Although there is not one consistent definition in the literature, SUPC is commonly defined as a newborn who is term or late preterm (≥ 35 weeks), well at birth (with a 5 minute Apgar score ≥ 7 and considered well enough to receive routine newborn care), who experiences an unexpected cardio-respiratory collapse within the first seven days after birth and:

- Requires resuscitation with either intermittent positive-pressure ventilation (IPPV) or cardiopulmonary resuscitation (CPR) or,
- Requires intensive care admission (with or without developing encephalopathy) or,
- Dies as a result of their injuries [2,4,6]

Table 1:
SUPC and other sleep related infant deaths

	SUDDEN, UNEXPECTED POSTNATAL COLLAPSE (SUPC)	SUDDEN, UNEXPECTED INFANT DEATH DURING SLEEP*
TIMELINE	Unexpected life-threatening event and/or death as a result of undetermined causes during the first week of life	Unexpected deaths during sleep due to undetermined causes, accidental causes and natural causes during the first year of life
PATIENT POPULATION	Healthy term and late preterm newborns	All infants
ASSOCIATED RISK FACTORS	Strong association with unsafe newborn positioning during skin-to-skin contact (SSC) and breastfeeding	Strong association with unsafe sleeping practices and pre-existing vulnerabilities

* *Umbrella term used to refer to all unexpected infant deaths that occur during sleep as a result of undetermined causes - formerly referred to as SIDS, SUDI or SUDI.*

SUPC may be observed by the clinician as a brief, sudden, and unexplainable event where spontaneous breathing stops and the newborn becomes unresponsive, cyanotic, apneic, and/or bradycardic as a result of positional occlusion of the airway. However, it may also be connected to a previously unknown pathophysiology affecting the newborn.[3] Rapid identification of SUPC and the initiation of timely resuscitative measures are critical in preventing severe neurologic sequelae and/or death from occurring.[3] In the event of SUPC, the health care team should initiate appropriate resuscitation measures without delay.

It has been challenging to determine the true extent of SUPC due to the lack of a consistent definition and inclusion/exclusion criteria. It is also thought to be widely underreported since it has been found that only the most severe events are documented in the literature.[2] Thus, it is not surprising that estimates of these events vary widely depending on the definition and inclusion criteria used, with some studies giving a vast estimate ranging from 2.6 to 133 cases per 100,000 births.[2,6] The World Health Organization (WHO) provides a more conservative approach with the estimated incidence in the first 2 hours after birth being between 1.6 to 5 cases per 100,000 births.[3,12] A more recent publication by the British Association of Perinatal Medicine in 2022 estimates that SUPC occurs in 2.6 to 19 per 100,000 live births.[4] Despite the inconsistencies, what remains consistent in the literature is how catastrophic SUPC events are, with as many as half of all cases being fatal.[2,3,4,6,11]

Approximately one third of reported SUPC events occur during the first 2 hours after birth, a further one third occur between 2 and 24 hours after birth, and the final one third occur between 24 hours after birth and 7 days of life.[3,4,6,9] Given that approximately two thirds of SUPC events occur within the first 24 hours after birth, when the newborn is typically followed closely in a birthing setting, it is important for perinatal and newborn care providers to support postnatal care practices that reduce the risk of these events. SUPC is possibly preventable, and as such, increased vigilance is needed to identify avoidable risk factors and increase protective countermeasures when risks are unavoidable.[4]

Figure 1:
Timing of Sudden Unexpected Postnatal Collapse (SUPC) Events

Risk Factors for SUPC[2,3,4,6,8,10,11,12]

In many cases, SUPC may be a preventable event. As such, it is important to identify modifiable risk factors and increase protective countermeasures where non-modifiable risk factors exist. The following table summarizes the literature review of modifiable and non-modifiable risk factors for SUPC events. The framework for practice that will be introduced later in this resource aims to support perinatal and newborn health care providers to address modifiable risk factors.

Table 2: Risk Factors for SUPC

NON-MODIFIABLE RISK FACTORS	MODIFIABLE RISK FACTORS
First 2 hours after Birth • Newborns who required resuscitation at birth • Long/Difficult delivery • Intrapartum medications that may affect the newborn (e.g. general anesthesia, opioid exposure etc.)	**Unsafe positioning of the mother/person and newborn while:** • Providing skin-to-skin contact (SSC) • Breast/chest feeding
Primiparous mothers/people	**Unsupervised SSC or unsupervised breast/chest feeding** *(especially in the first 2 hours after birth)* • Parent(s) left alone/unsupported in first hours after birth
Mother/Caregiver Fatigue	**Mother/Caregiver Fatigue**
Mother/Individual body mass index >25 kg/m2	**Mother/Caregiver Distractions:** • Cellphone/Smartphone use • Pain • Sedation
	Occlusion of the newborn's nose or mouth • Poorly positioned prone position of the newborn while breast/chest feeding or while skin-to-skin
	Dim lighting
	Lack of knowledge of SUPC • Parent(s)/Caregiver(s) • Perinatal/Newborn Staff
	Inadequate staffing levels

Importance of Skin-to-Skin Contact (SSC) and Breastfeeding

The first hours and days after birth are a critical window and a sensitive period in human development. The first hour after birth is often referred to as the Golden Hour, or the Sacred Hour. In healthy term and well late preterm newborns, evidence-based practices performed during this critical period such as uninterrupted skin-to-skin contact, deferred (delayed) cord clamping, and early breast/chest feeding improve immediate and long-term health outcomes and reduce morbidity and mortality for the newborn.

The WHO[12,13] endorses immediate and uninterrupted skin-to-skin contact between the mother/person and the newborn with assistance (as needed) to initiate breast/chest feeding as soon as possible after birth. Health care providers should be available to support the initiation of feeding; however, the woman/person may prefer the assistance of a family member or an elder in this generational life experience. Exclusive breast/chest feeding for the first six months with the introduction of nutritious, iron-rich complementary foods beginning at around six months, with ongoing breast/chest feeding for up to two years and beyond is recognized as a global public health recommendation.[7,9,12,13]

Table 3:
Elements of Safe Skin-to-Skin Positioning

- Mother/parent is upright or semi-upright
- Newborn is chest-to-chest with the mother/parent
- Head is in a "sniffing" position with their airway open and head turned to one side
- Face is visible and the nose and mouth remain uncovered
- Neck is midline and straight
- Shoulders and neck are straight and flat against the mother/parent
- Legs are flexed
- Newborns back is covered with a blanket

Surveillance, Education, Empowerment "S.E.E"
a Framework for Practice

The framework for practice is iterative in nature, perinatal and newborn health care providers will navigate across and through each of the three themes at different stages of the perinatal continuum from preconception through to postpartum. Throughout the next section of this practice resource, we will look in greater detail at the "S.E.E" framework, and how clinicians who care for pregnant and postpartum women/people and their newborns can use this framework to help inform their practice.

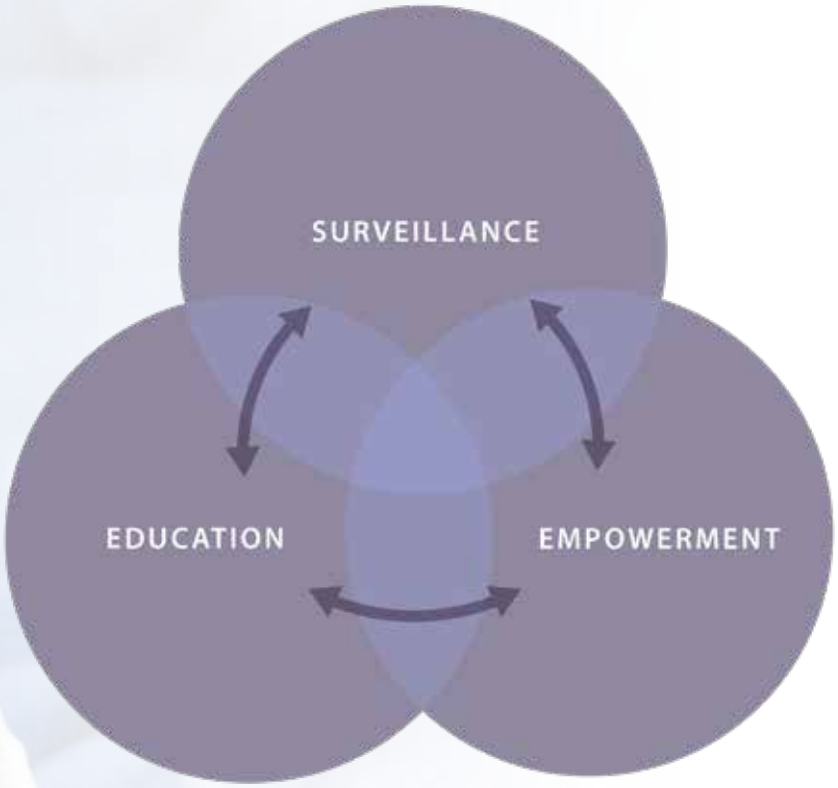

Figure 2:
"S.E.E." Framework

SURVEILLANCE

Increased surveillance through close monitoring and observation in the first hours and days after birth is crucial in order to support safe skin-to-skin practices between the mother/person and the newborn and to identify and promptly respond to rare SUPC events. The following practices are recognized as a means to increase surveillance of the dyad while admitted to the hospital:

- Support the early initiation of skin-to-skin contact, irrespective of chosen feeding method with education provided on responsive feeding and observation of the first breast/chest feed.
- Have established protocols and processes around one-to-one nursing and/or midwifery care in the first two hours after birth.[1]
- Health care providers maintain situational awareness – especially in the first two hours after delivery.
- Frequent rounding on parent/newborn dyad in the hospital, especially overnight.
- Increase surveillance by the health care provider in the first two hours after birth.
  - **Recommend observation and documentation of the newborn's status every 15 minutes for the first 2 hours after birth**[1]
  - Ensure adequate lighting when observing mother/person and newborn
  - Use a standardized assessment tool or a standardized safe positioning checklist
    - **R.A.P.P.T** checklist every 15 minutes for the first two hours after birth – assessment of
      Respirations,
      Activity,
      Perfusion (colour),
      Position and
      Tone[1,10] (see **Table 4**)

Table 4:

R.A.P.P.T. assessment

(Adapted from Lundington-Hoe & Morgan, 2017)

	NORMAL	ABNORMAL	RESPONSE TO ABNORMAL FINDINGS
RESPIRATORY R	• Easy	• Apnea • Increased WOB: grunting, nasal flaring, retracting, and tachypnea	• Apnea: initiate appropriate resuscitation measures • Increased WOB: – Measure SpO_2 to determine need for supplemental oxygen – Reposition head/neck – Improve position of mother/parent/caregiver
ACTIVITY A	• Sleep • Quiet alert • Active alert • Crying • Breast/Chest feeding	• Non-responsive	• Initiate appropriate resuscitation measures
PERFUSION P	• Pink • Acrocyanosis	• Pale • Dusky	• Measure SpO_2 to determine need for supplemental oxygen • Initiate appropriate resuscitation measures in indicated
POSITION P	• Head turned to side • Neck straight • Nares/mouth visible	• Face into chest or breast • Neck extended or flexed • Nares and/or mouth partially or fully occluded	• Reposition head/neck • Improve position of mother/parent/caregiver • Uncover mouth/nares
TONE T	• Limbs flexed	• Limp, flaccid, no recoil	• Initiate appropriate resuscitation measures

WOB = Work of Breathing

EDUCATION

A thorough review of the literature suggests that education must be provided to both perinatal and newborn health care providers, as well as to the families that they care for. There is a need for education around the risk factors for SUPC and how to safely practice skin-to-skin care. It is important for this knowledge to be shared with families at all stages of the perinatal continuum, starting early in the pregnancy journey in primary care and public health care settings and moving through to acute care settings.

For Health Care Providers

Perinatal and newborn providers require frequent and ongoing education about risk factors for SUPC and how they can support safe newborn positioning while skin-to-skin.

- Use of multi-faceted approaches such as posters, hand-outs, bulletin board notices, e-learning modules, and safety huddles as ways to disseminate the information to clinicians. See relevant resources on safe skin-to-skin contact and prevention of SUPC.

  Skin-to-Skin Key Messages for HCP
  SUPC
  Safer Skin-to-Skin Contact

- Use of both formal and informal techniques to share relevant information on a regular basis

- Educational campaigns and unit-specific initiatives and audits to monitor and evaluate knowledge translation strategies

- Include SUPC and safe newborn positioning while skin-to-skin as items that are included in unit orientation

  Review SUPC Hub topic (with hyperlink)
  Review Skin-to-Skin Key Messages for Health Care Provider (hyperlink when available)

- Orientation on charting in appropriate fields based on unit specific charting system

For Families

Antenatal discussion is recommended at multiple touch points throughout the pregnancy journey using the 4 R's of cross-cultural dialogue, discuss the following:

- The importance of skin-to-skin care, regardless of chosen feeding method and how to do it safely

- The signs and symptoms that a newborn is well and how to recognize signs of illness - encouraging families to seek help at any point should they feel their newborn is unwell

- A review of safer sleep practices

Include educational materials in a variety of settings that patients and their families may access during the pregnancy journey (e.g. primary care settings, public health offices etc.) Whenever possible, education should be provided in a variety of formats (visual, written etc.) and based on the language needs of the family.

- Use posters and handouts
- Use videos that demonstrate safe skin-to-skin practices

Teach safe skin-to-skin positioning and practices and highlight the risks associated with SUPC, especially in the immediate postpartum period

- Explain the rationale for frequent surveillance to families. Normalize that frequent monitoring 1:1 in the first two hours is routine practice done consistently for all families. Monitoring should be done in a way that ensures preservation of a sense of cultural safety while receiving care.

- Encourage continual observation during skin-to-skin contact and avoiding modifiable distractions, such as mobile phone use when practicing skin-to-skin.

- Review safe sleep practices using either the Safer Infant Sleep or Honouring Our Babies Safer Sleep Toolkit, and engage with families using the 4 R's of cross cultural dialogue to explore sleeping plans and arrangements at home

  – Recommend close monitoring of the newborn in any situation that could potentially obstruct/ compromise the airway (e.g. car seats)

- Reinforce that whenever the mother/person becomes drowsy or excessively tired with SSC, the safest thing to do is to place the infant on their back on a firm, flat safe sleep surface (i.e. crib or bassinet) free of objects or to encourage another parent/ caregiver who is alert and awake to hold the baby

Share resources with families during the perinatal period:

BC Women's Hospital and Health Centre: Doing Skin-to-Skin Safely

Fraser Health Authority: Safe Skin-to-Skin Cuddling ; Arabic; Chinese; Korean; Farsi; Punjabi; Spanish; Russian.

Fraser Health Authority: Breastfeeding/chestfeeding - module two - skin to skin (video)

Perinatal Services BC (PSBC):
My Baby's Special Hour - The Golden Hour
Skin-to-skin poster
Skin-to-skin fact sheet

EMPOWERMENT

Perinatal and newborn health care providers should engage in strength-based relational practice with women/people and their families. It is important to be mindful of an individual's right to self-determination. Clinicians should work to build trust and foster genuine connections with the families that they work with and provide education and options, so that women/people and their families can make informed decisions about their care and feel empowered to make decisions that reflect their individual circumstances. Clinicians should ensure that they:

- Equip families with knowledge and education around safe skin-to-skin practices
- Empower families to raise questions and concerns and ensure that they will be listened to/supported
- Spend time with families to ensure they are aware of the modifiable risk factors of SUPC and how to take steps to reduce risk where non-modifiable risk factors exist.
- Encourage families to observe and engage with their baby frequently
- Enable parents/caregivers to understand and implement safer infant sleep practices

Additional Resources for Health Care Providers

Association of Women's Health, Obstetric and Neonatal Nurses: Sudden Unexpected Postnatal Collapse in Healthy Term Newborns: AWHONN Practice Brief (2020)

BC Women's Hospital: Mother-Baby Togetherness (BC Women's Hospital procedure consists of keeping mother/birth parent and baby together in skin-to-skin and close proximity in order to enhance physical and emotional interactions through touch, sight, hearing, smell and taste.)

British Association of Perinatal Medicine: Sudden and Unexpected Postnatal Collapse: A BAPM Framework for Reducing Risk, Investigation and Management

British Association of Perinatal Medicine: Sudden and Unexpected Postnatal Collapse (Webinar) Webinar: Sudden and Unexpected Postnatal Collapse

In Joy Health Education (Webinar): Skin to Skin and the Impact on Exclusive Breastfeeding (starting at 32:35 seconds of webinar)

Perinatal Outreach Education Program - South Coastal LA/ Orange: Skin to Skin Safety: Reducing the Risk of Sudden Unexpected Postnatal Collapse (presentation video)

Perinatal Services BC (PSBC):
Safer Infant Sleep
Skin-to-skin Key Messages for health care providers
Sudden Unexpected Postnatal Collapse Hub topic
Golden Hour Hub topic

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Sudden Unexpected Postnatal Collapse (SUPC) occurs in term or late preterm infants who are well at birth and who experience an unexpected cardio-respiratory collapse within the first seven days after birth.

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