EtD 45. Should skin-to-skin care vs. no skin-to-skin care be used for mothers of preterm infants to improve breastfeeding?

POPULATION:	Preterm infants
INTERVENTION:	Skin-to-skin care
COMPARISON:	skin-to-skin care
MAIN OUTCOMES:	**Critical outcomes** Mortality Fully breastfed or breastmilk feeding at hospital discharge Adverse effects Breastmilk supply Initiation, establishment, and maintenance of breastfeeding (including readiness to breastfeed, sucking bursts, competent sucking and establishment of breastfeeding prior to discharge) Infant responsiveness and readiness to feed **Important but not critical** Time to full enteral feeds Faltering growth/body composition Duration of initial hospital stay Neurodevelopmental impairment Sepsis: proven or suspected Bronchopulmonary dysplasia Retinopathy of prematurity Anaemia of prematurity Cost: cost of intervention, cost of neonatal care and life-long cost **Less important for decision making** Time to full sucking feeds
SETTING:	Neonatal care
PERSPECTIVE:	Clinical recommendation: patient perspective
BACKGROUND:	Skin-to-skin care (also called Kangaroo Mother Care or Pikau (baby wearing)) is a method of caring for preterm infants that involves holding them prone and upright on the chest of a parent or caregiver to give prolonged skin-to-skin contact between a mother and her infant and is recommended in neonatal care to promote breastfeeding and maternal-infant bonding. It is a simple and cost-effective intervention that decreases neonatal morbidity, mortality, hypoglycaemia, and the risk of infection in preterm infants. Initiating skin-to-skin care within the first 24 hours after birth and continuing throughout all levels of neonatal care may positively influence maternal milk supply by stimulating prolactin and oxytocin release, hormones critical for lactation. For preterm infants, kangaroo care has been associated with improved readiness to breastfeed, better sucking patterns, and more effective milk transfer. This close physical contact can also enhance maternal confidence in breastfeeding and foster an earlier and more successful establishment

	and maintenance of breastfeeding prior to discharge. Mothers who practice kangaroo care are more likely to initiate and sustain breastfeeding due to increased milk production and confidence in their ability to provide for their infant. Skin-to-skin care initiated before a scheduled feed promotes preterm infants' physiological stability and responsiveness, preparing them for more effective feeding interactions. The skin-to-skin contact calms the infant, improves oxygen saturation, thermoregulation and primes the infant for active feeding behaviours, such as rooting and coordinated sucking bursts. This may enhance feeding readiness and support better feeding outcomes compared to infants who do not receive skin-to-skin care before feeding.
CONFLICT OF INTERESTS:	None

Assessment

Desirable Effects

How substantial are the desirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Trivial ○ Small ○ Moderate ● Large ○ Varies ○ Don't know	Evidence based on a Cochrane review [1] and systematic reviews [2-6] **Mortality**: RCT: Very large reduction in mortality with skin-to-skin care (9 fewer per 1,000; 13 fewer to 4 fewer); effect was increased with earlier initiation (37 fewer per 1,000; 55 fewer to 15 fewer) [Critical]. **Fully breastfed or breastmilk feeding at hospital discharge:** RCT: Very large increase in being breastfed at discharge for skin-to-skin care (157 more per 1,000; 7 more to 354 more); discharge/28 days of life (262 more per 1,000; 240 more to 284 more); 1-3 months follow-up (RR 1.39, 95%CI 0.99 to 1.97); 28 days of age (RR 1.01; 0.98 to 1.04); exclusive breastfeeding at discharge (RR 1.12, 95%CI 1.07 to 1.16); (RR 1.09, 95%CI 0.83 to 1.44). **Fully breastfed or breastmilk feeding at hospital discharge**: RCT: Decrease in time to initiate exclusive breastfeeding for skin-to-skin care (MD 2.6 days lower; 3.96 lower to 1.23 lower) [Critical]. **Breastmilk supply:** RCT: Skin-to-skin care increased breastmilk supply and volume compared with standard care [Critical]. **Infant responsiveness and readiness to feed**: RCT: IBFAT scores increased for skin-to-skin care compared with standard care and infants receiving 2 hours of skin-to-skin care per day had higher scores than infants receiving 1 hour per day [Critical]. **Adverse effects**: RCT: Hypothermia: Very large effect for reduced risk of hypothermia for skin-to-skin care (140 fewer per 1,000; 186 fewer to 71 fewer) and (175 fewer per 1,000; 208 fewer to 121 fewer). Reduction in hypothermia also observed for early vs. later initiation of skin-to-skin care (RR 0.74, 95%CI 0.61 to 0.90) [Critical]. **Adverse effects**: RCT: Hypogycaemia: Very large reduction in risk of hypoglycaemia for skin-to-skin care (96 fewer per 1,000; 122 fewer to 34 fewer) [Critical]. **Time to full enteral feeds**: RCT: One study found a reduced time until full enteral feeds for infants receiving skin-to-skin care as compared with standard care and one study found no difference [Important]. **No faltering growth/body composition:** RCT: Large effect for increased weight gain for skin-to-skin	Conde-Agudelo 2017 [1] Studies included LBW infants. Sivanandan 2023 [2]; Mekonnen 2019 [3] Low birthweight and/or preterm infants. Ghojazadeh 2019 [6] The average gestational age of all participants was 34.8 weeks. The mean birthweight was 2.31 in the skin-to-skin care group and 2.30 in the conventional care group. Clarke-Sather 2024 [4] Studies included LBW and VLBW infants, very preterm and moderate to late preterm infants.

	care (MD 4.08 g/day higher; 2.3 higher to 5.86 higher). Small increase in length (MD 0.21 higher; 0.03 higher to 0.38 higher) and head circumference (MD 0.18 higher; 0.09 higher to 0.27 higher). [Important] **Duration of initial hospital stay**: RCT: Reduction in initial hospitalisation (MD 2.37 days lower; 3.66 lower to 1.08 lower); (MD 0.3 days lower; 0.31 lower to 0.29 lower) [Important]. **Neurodevelopmental impairment**: RCT: No significant reduction in cerebral palsy (RR 0.65, 95%CI 0.21 to 2.02) and severe disability at 20 years (RR 0.34, 95%CI 0.09 to 1.24) for skin-to-skin care. No significant effect on cognitive scores for skin-to-skin care (MD 0.21 points higher; 1.84 lower to 2.26 higher) [Important]. **Sepsis**: RCT: Reduced risk of nosocomial sepsis for skin-to-skin care (32 fewer per 1,000; 45 fewer to 17 fewer) and for early initiation of skin-to-skin care (RR 0.85, 95%CI 0.75 to 0.95) [Important]. **Cost**: cost of intervention, cost of neonatal care and life-long cost: RCT: Reduced cost associated with skin-to-skin care [Important]. **Desirable effects for Māori** No additional evidence available	

Outcomes	№ of participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects* (95% CI)	
				Risk with no skin-to-skin care	Risk difference with skin-to-skin care
Mortality: RCT assessed with: hospitalisation or 28 days of life	10505 (12 RCTs)	⨁⨁⨁⨁ High	**RR 0.68** (0.53 to 0.87)	Study population	
				28 per 1,000	**9 fewer per 1,000** (13 fewer to 4 fewer)
Mortality: RCT: Early (within 24 hours) vs. late assessed with: hospitalisation or 28 days of life	3533 (3 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 0.77** (0.66 to 0.91)	Study population	
				161 per 1,000	**37 fewer per 1,000** (55 fewer to 15 fewer)
Fully breastfed or breastmilk feeding at hospital discharge: RCT assessed with: 1-3 months' follow-up	8139 (7 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 1.39** (0.99 to 1.97)	Study population	
				Not reported	Not reported
Fully breastfed or breastmilk feeding at hospital discharge: RCT: assessed with: Time to initiate exclusive breastfeeding (days)	1900 (8 RCTs)	⨁◯◯◯ Very low[b,c,d,e]	-	The mean fully breastfed or breastmilk feeding at hospital discharge: RCT: was not reported	MD **2.6 lower** (3.96 lower to 1.23 lower)
Fully breastfed or breastmilk feeding at hospital discharge: RCT assessed with: exclusive breastfeeding rate at discharge/28 days of life	9983 (9 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 1.48** (1.44 to 1.52)	Study population	
				546 per 1,000	**262 more per 1,000** (240 more to 284 more)

Fully breastfed or breastmilk feeding at hospital discharge: RCT/quasi RCT	1341 (10 RCTs)	⨁◯◯◯ Very low[c,f,g]	**RR 1.24** (1.01 to 1.54)	Study population	
				656 per 1,000	**157 more per 1,000** (7 more to 354 more)
Fully breastfed or breastmilk feeding at hospital discharge: RCT	Not reported (3 RCTs)	⨁◯◯◯ Very low[b,f]	-	One study found that breastfeeding within 24 hours post-birth, being brought to the breast within 72 hours post-birth, and full breastfeeding within 7 days post-birth were all higher for skin-to-skin care groups compared with standard care groups. A second study found an increased percentage of infants breastfed at discharge for skin-to-skin care compared with standard care and the third study found no difference in the time to full breastfeeding between groups.	
Fully breastfed or breastmilk feeding at hospital discharge: RCT: Early vs. late assessed with: Exclusive breastfeeding at 28 days of age	2841 (3 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 1.01** (0.98 to 1.04)	Study population	
				Not reported	Not reported
Fully breastfed or breastmilk feeding at hospital discharge: RCT: Early vs. late assessed with: Exclusive breastfeeding at discharge	2841 (3 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 1.12** (1.07 to 1.16)	Study population	
				Not reported	Not reported
Fully breastfed or breastmilk feeding at hospital discharge: RCT:	Not reported (13 RCTs)	⨁◯◯◯ Very low[f,k]	**RR 1.09** (0.83 to 1.44)	Study population	
				Not reported	Not reported
Adverse effects: RCT assessed with: Hypothermia by discharge or 40 weeks' PMA or 28 days after birth	1169 (11 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 0.32** (0.19 to 0.53)	Study population	
				257 per 1,000	**175 fewer per 1,000** (208 fewer to 121 fewer)
Adverse effects: RCT/quasi RCT: assessed with: Hypothermia	2873 (23 RCTs)	⨁◯◯◯ Very low[c,f,g,i]	**RR 0.49** (0.32 to 0.74)	Study population	
				274 per 1,000	**140 fewer per 1,000** (186 fewer to 71 fewer)
Adverse effects: RCT: Early vs. late assessed with: Hypothermia at discharge or by 28 days	3553 (3 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 0.74** (0.61 to 0.90)	Study population	
				Not reported	Not reported
Adverse effects: RCT/quasi RCT: assessed with: Hypoglycaemia	922 (7 RCTs)	⨁⨁◯◯ Low[f,g]	**RR 0.32** (0.13 to 0.76)	Study population	
				141 per 1,000	**96 fewer per 1,000** (122 fewer to 34 fewer)
Breastmilk supply: RCT	42 (1 RCT)	⨁◯◯◯ Very low[j,e,m]	-	One study found that skin-to-skin care helped in increasing and building milk supply and milk volume expressed, but standard care did not.	
Infant responsiveness and readiness to feed: RCT assessed with: Infant Breastfeeding Assessment Tool (IBFAT)	40 (1 RCT)	⨁◯◯◯ Very low[j,e,m]	-	IBFAT scores increased for skin-to-skin care compared with standard care and infants receiving 2 hours of skin-to-skin care per day had higher scores than infants receiving 1 hour per day.	

Time to full enteral feeds: RCT	143 (2 RCTs)	⨁◯◯◯ Very low[a,f,m]	-	One study found a reduced time until full enteral feeds for infants receiving skin-to-skin care as compared with standard care and one study found no difference.	
Faltering growth/body composition: RCT assessed with: Weight gain at latest follow-up (g/d)	1198 (11 RCTs)	⨁⨁◯◯ Low[a,b]	-	The mean faltering growth/body composition: RCT was **17 g/day**	MD **4.08 higher** (2.3 higher to 5.86 higher)
Faltering growth/body composition: RCT: Early v late assessed with: Weight gain at 28- day follow- up (g/d)	204 (1 RCT)	⨁◯◯◯ Very low[j,k]	-	The mean faltering growth/body composition: RCT: Early v late was not reported	MD **2.2 lower** (5.26 lower to 0.86 higher)
Faltering growth/body composition: RCT assessed with: Length gain at latest follow-up (cm/week)	377 (3 RCTs)	⨁◯◯◯ Very low[a,b,e]	-	The mean faltering growth/body composition: RCT was not reported	MD **0.21 higher** (0.03 higher to 0.38 higher)
Faltering growth/body composition: RCT assessed with: Head circumference gain at latest follow- up (cm/week)	652 (5 RCTs)	⨁⨁◯◯ Low[a,b]	-	The mean faltering growth/body composition: RCT was not reported	MD **0.18 higher** (0.09 higher to 0.27 higher)
Duration of initial hospital stay: RCT assessed with: Days	3437 (31 RCTs)	⨁◯◯◯ Very low[c,b,g,i]	-	The mean duration of initial hospital stay: RCT was **23.23 days**	MD **2.37 lower** (3.66 lower to 1.08 lower)
Duration of initial hospital stay: RCT assessed with: Days	3498 (3 RCTs)	⨁⨁⨁◯ Moderate[a]	-	The mean duration of initial hospital stay: RCT was not reported	MD **0.3 lower** (0.31 lower to 0.29 lower)
Neurodevelopmental impairment : RCT assessed with: Cerebral palsy at 12 months' corrected age	588 (1 RCT)	⨁◯◯◯ Very low[e,j,k]	**RR 0.65** (0.21 to 2.02)	Study population Not reported	 Not reported
Neurodevelopmental impairment: RCT assessed with: Severe disability at 20 years	264 (1 RCT)	⨁◯◯◯ Very low[e,j,k]	**RR 0.34** (0.09 to 1.24)	Study population Not reported	 Not reported
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Cognitive score Scale from: 1 to 100	516 (1 RCT)	⨁◯◯◯ Very low[a,h,j]	-	The mean neurodevelopmental impairment: RCT: Bayley III Cognitive score was not reported	MD **0.21 higher** (1.84 lower to 2.26 higher)
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Motor score Scale from: 1 to 100	516 (1 RCT)	⨁◯◯◯ Very low[a,h,j]	-	The mean neurodevelopmental impairment: RCT: Bayley III Motor score was not reported	MD **0.85 lower** (2.65 lower to 0.95 higher)
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Language score Scale from: 1 to 100	516 (1 RCT)	⨁◯◯◯ Very low[a,h,j]	-	The mean neurodevelopmental impairment: RCT: Bayley III Language score was not reported	MD **0.91 lower** (2.46 lower to 0.64 higher)
Sepsis: proven or suspected: RCT: Early vs.	3415		**RR 0.85**	Study population	

late assessed with: Nosocomial sepsis	(2 RCTs)	⨁⨁⨁◯ Moderate[a]	(0.75 to 0.95)	Not reported	Not reported
Sepsis: proven or suspected: RCT assessed with: nosocomial clinical sepsis	9847 (9 RCTs)	⨁⨁⨁◯ Moderate[a]	**RR 0.85** (0.79 to 0.92)	Study population	
				215 per 1,000	**32 fewer per 1,000** (45 fewer to 17 fewer)
Bronchopulmonary dysplasia - not measured	-	-	-	-	-
Retinopathy of prematurity - not measured	-	-	-	-	-
Anaemia of prematurity - not measured	-	-	-	-	-
Cost: cost of intervention, cost of neonatal care and life-long cost: RCT assessed with: US$	334 (2 RCTs)	⨁◯◯◯ Very low[a,b,l]	-	One study reported the overall cost was "about 50% less for KMC" (US$19,289 for skin-to-skin care and US$39,764 for conventional care). Another study reported "costs of neonatal care were greater in the control than in the skin-to-skin group. " Overall, the cost of hospital stay and post-neonatal care at five months was US$741 greater for the control than the skin-to-skin group. However, data were available for only 49 infants (24 skin-to-skin, 25 control) at six months' follow-up.	
Time to full sucking feeds - not measured	-	-	-	-	-

a. Downgraded one level for inconsistency
b. Downgraded two levels for risk of bias
c. Downgraded two levels for inconsistency as I2>80%
d. Downgraded one level for indirectness as studies were conducted in India, Bangladesh and Brazil and included preterm and low birthweight infants
e. Downgraded one level for imprecision due to wide confidence intervals or low sample numbers
f. Downgraded one level for risk of bias
g. Downgraded one level for indirectness as included both term and preterm infants

a. Downgraded one level for imprecision as confidence intervals cross the line of no effect
b. Downgraded one level for evidence of publication bias - significant Egger's test
c. Downgraded one level for indirectness as evidence is based on a single study
d. Downgraded two levels for imprecision due to wide confidence intervals that cross the line of no effect
e. Downgraded one level for indirectness as the review is based on low birthweight infants and not generalisable
f. Downgraded two levels for imprecision as based on very low numbers

Undesirable Effects

How substantial are the undesirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
● Trivial ○ Small ○ Moderate ○ Large ○ Varies	**Faltering growth/body composition**: RCT: No significant decrease in weight gain with early initiation of skin-to-skin care (MD 2.2 g/day lower; 5.26 lower to 0.86 higher) [Important]. **Neurodevelopmental impairment**: RCT: No significant effect on motor scores (MD 0.85 points lower; 2.65 lower to 0.95 higher) and language scores (MD 0.91 points lower; 2.46 lower to 0.64 higher) for skin-to-skin care [Important].	

○ Don't know	**Undesirable effects for Māori** No additional evidence available	

Certainty of evidence

What is the overall certainty of the evidence of effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Very low ○ Low ● Moderate ○ High ○ No included studies	High to very low certainty of evidence overall **Certainty of evidence for Māori** No additional evidence available.	

Outcomes	Importance	Certainty of the evidence (GRADE)
Mortality: RCT assessed with: hospitalisation or 28 days of life	CRITICAL	⨁⨁⨁⨁ High
Mortality: RCT: Early (within 24 hours) vs. late assessed with: hospitalisation or 28 days of life	CRITICAL	⨁⨁⨁◯ Moderate
Fully breastfed or breastmilk feeding at hospital discharge: RCT assessed with: 1-3 months' follow-up	CRITICAL	⨁⨁⨁◯ Moderate
Fully breastfed or breastmilk feeding at hospital discharge: RCT: assessed with: Time to initiate exclusive breastfeeding (days)	CRITICAL	⨁◯◯◯ Very low
Fully breastfed or breastmilk feeding at hospital discharge: RCT assessed with: exclusive breastfeeding rate at discharge/28 days of life	CRITICAL	⨁⨁⨁◯ Moderate
Fully breastfed or breastmilk feeding at hospital discharge: RCT/quasi RCT	CRITICAL	⨁◯◯◯ Very low
Fully breastfed or breastmilk feeding at hospital discharge: RCT	CRITICAL	⨁◯◯◯ Very low[i]
Fully breastfed or breastmilk feeding at hospital discharge: RCT: Early vs. late assessed with: Exclusive breastfeeding at 28 days of age	CRITICAL	⨁⨁⨁◯ Moderate
Fully breastfed or breastmilk feeding at hospital discharge: RCT: Early vs. late assessed with: Exclusive breastfeeding at discharge	CRITICAL	⨁⨁⨁◯ Moderate

Fully breastfed or breastmilk feeding at hospital discharge: RCT:	CRITICAL	⨁◯◯◯ Very low
Adverse effects: RCT assessed with: Hypothermia by discharge or 40 weeks' PMA or 28 days after birth	CRITICAL	⨁⨁⨁◯ Moderate
Adverse effects: RCT/quasi RCT: assessed with: Hypothermia	CRITICAL	⨁◯◯◯ Very low
Adverse effects: RCT: Early vs. late assessed with: Hypothermia at discharge or by 28 days	CRITICAL	⨁⨁⨁◯ Moderate
Adverse effects: RCT/quasi RCT: assessed with: Hypoglycaemia	CRITICAL	⨁⨁◯◯ Low
Breastmilk supply: RCT	CRITICAL	⨁◯◯◯ Very low
Infant responsiveness and readiness to feed: RCT assessed with: Infant Breastfeeding Assessment Tool (IBFAT)	CRITICAL	⨁◯◯◯ Very low
Time to full enteral feeds: RCT	IMPORTANT	⨁◯◯◯ Very low
Faltering growth/body composition: RCT assessed with: Weight gain at latest follow-up (g/d)	IMPORTANT	⨁⨁◯◯ Low
Faltering growth/body composition: RCT: Early v late assessed with: Weight gain at 28- day follow- up (g/d)	IMPORTANT	⨁◯◯◯ Very low
Faltering growth/body composition: RCT assessed with: Length gain at latest follow- up (cm/week)	IMPORTANT	⨁◯◯◯ Very low
Faltering growth/body composition: RCT assessed with: Head circumference gain at latest follow- up (cm/week)	IMPORTANT	⨁⨁◯◯ Low
Faltering growth/body composition	IMPORTANT	-
Duration of initial hospital stay: RCT assessed with: Days	IMPORTANT	⨁◯◯◯ Very low
Duration of initial hospital stay: RCT assessed with: Days	IMPORTANT	⨁⨁⨁◯ Moderate
Neurodevelopmental impairment: RCT assessed with: Cerebral palsy at 12 months' corrected age	IMPORTANT	⨁◯◯◯ Very low

Neurodevelopmental impairment: RCT assessed with: Severe disability at 20 years	IMPORTANT	⨁◯◯◯ Very low
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Cognitive score	IMPORTANT	⨁◯◯◯ Very low
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Motor score	IMPORTANT	⨁◯◯◯ Very low
Neurodevelopmental impairment: RCT assessed with: 12 months of age using BSID- III - Language score	IMPORTANT	⨁◯◯◯ Very low
Sepsis: proven or suspected: RCT: Early vs. late assessed with: Nosocomial sepsis	IMPORTANT	⨁⨁⨁◯ Moderate
Sepsis: proven or suspected: RCT assessed with: nosocomial clinical sepsis	IMPORTANT	⨁⨁⨁◯ Moderate
Bronchopulmonary dysplasia - not measured	IMPORTANT	-
Retinopathy of prematurity - not measured	IMPORTANT	-
Anaemia of prematurity - not measured	IMPORTANT	-
Cost: cost of intervention, cost of neonatal care and life-long cost: RCT	IMPORTANT	⨁◯◯◯ Very low
Time to full sucking feeds (<0.5 days) - not measured	NOT IMPORTANT	-

Values

Is there important uncertainty about or variability in how much people value the main outcomes?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Important uncertainty or variability ● Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ○ No important uncertainty or variability	Possibly important uncertainty or variability	

Balance of effects

Does the balance between desirable and undesirable effects favour the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favours the comparison ○ Probably favours the comparison ○ Does not favour either the intervention or the comparison ○ Probably favours the intervention ● Favours the intervention ○ Varies ○ Don't know	**Skin-to-skin care vs. no skin-to-skin care - high certainty evidence** Reduced mortality **Skin-to-skin care vs. no skin-to-skin care - moderate certainty evidence** Reduced mortality, hypothermia, duration of initial hospitalisation, sepsis (early initiation) Increase in exclusive breastfeeding at discharge Uncertain effect for fully breastfed or breastmilk feeding at hospital discharge/28 days of age, exclusive breastfeeding at 28 days of age **Skin-to-skin care vs. no skin-to-skin care - low certainty evidence** Reduced hypoglycaemia Increase in weight gain and head circumference at latest follow-up **Skin-to-skin care vs. no skin-to-skin care - very low certainty evidence** Decrease in time to initiate exclusive breastfeeding Reduced hypothermia; duration of initial hospitalisation, cost Increase in exclusive breastfeeding at discharge; breastmilk supply and volume; Infant Breastfeeding Assessment Tool (IBFAT) score; length Uncertain effect for fully breastfed or breastmilk feeding at hospital discharge; time to full enteral feeds; weight gain (early initiation); neurodevelopmental impairment (cerebral palsy, severe disability at 20 years, cognitive score, motor score, language score) **Balance of effects for Māori** No additional evidence available.	

Resources required

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings	Parents' time Space in the neonatal unit **Resources required for Māori**	

○ Large savings ● Varies ○ Don't know	No additional evidence available.	

Certainty of evidence of required resources

What is the certainty of the evidence of resource requirements (costs)?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Very low ○ Low ● Moderate ○ High ○ No included studies	A formal assessment of the certainty of evidence of the cost was not undertaken. **Certainty of evidence of required costs for Māori** No additional evidence available.	

Cost effectiveness

Does the cost-effectiveness of the intervention favour the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favours the comparison ○ Probably favours the comparison ○ Does not favour either the intervention or the comparison ○ Probably favours the intervention ○ Favours the intervention ○ Varies ● No included studies	Very low certainty evidence reported in one study that the overall cost was "about 50% less for skin-to-skin care" (US$19,289 for skin-to-skin care and US$39,764 for conventional care). Another study reported "costs of neonatal care were greater in the control than in the skin-to-skin care group. " Overall, the cost of hospital stay and post neonatal care at five months was US$741 greater for the control than the skin-to-skin group. However, data were available for only 49 infants (24 skin-to-skin, 25 control) at six months' follow-up.	

Equity

What would be the impact on health equity?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Reduced	**Equity for Māori**	

○ Probably reduced ○ Probably no impact ○ Probably increased ● Increased ○ Varies ○ Don't know	Pēpi Māori experience higher rates of preterm birth, sepsis and neurodisability and are less likely to survive compared to other ethnicities. They transition off parenteral fluids faster than others yet are less likely to receive mother's own milk only. By day three, over half of pēpi Māori receive alternative nutrition not based on mother's own milk. At discharge, they are significantly less likely to be exclusively breastfed. Colonisation continues to affect Māori health outcomes. Promoting skin-to-skin care may support breastfeeding success and help reduce existing disparities in early nutrition and bonding for Māori mothers and their preterm pēpi. **Equity for Pacific families** Pacific infants had the highest rate of transition to mother's own milk only, yet over one in five still received alternative nutrition by day three. Pacific families may not receive adequate support or information to practise skin-to-skin care regularly, especially in busy units with limited space or staffing. When culturally appropriate support is lacking, opportunities to support breastfeeding through skin-to-skin may be lost. Equity requires enabling safe, supported kangaroo care for all families. **Equity for underrepresented groups** Families who are migrants, live rurally or lack transport may find it difficult to provide frequent skin-to-skin care. Without flexible visiting policies or logistical support, participation may be limited. Equity calls for inclusive NICU policies and resources to ensure all families can benefit from early skin-to-skin contact. In the DIAMOND RCT, Asian infants also showed varied access to exclusive breastfeeding. These differences reflect broader systemic inequities in healthcare delivery and cultural support. Implementing skin-to-skin care across all settings may offer a culturally inclusive, low-cost method to enhance bonding and breastfeeding rates. Standardising this practice could help reduce ethnic disparities by ensuring consistent support for all mothers and infants. Promoting skin-to-skin care can particularly benefit underrepresented groups by supporting equitable early feeding outcomes and maternal wellbeing.	

Acceptability

Is the intervention acceptable to key interest-holders?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	Probably acceptable to most families. **Acceptability for Māori** No additional evidence available.	

Feasibility

Is the intervention feasible to implement?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	Barriers may include a lack of private spaces (this has been reported in our interviews), staffing to support parents or clinician hesitation in unstable infants or with umbilical catheters. **Feasibility for Māori** No additional evidence available.	

Summary of judgements

	JUDGEMENT						
DESIRABLE EFFECTS	Trivial	Small	Moderate	**Large**		Varies	Don't know
UNDESIRABLE EFFECTS	**Trivial**	Small	Moderate	Large		Varies	Don't know
CERTAINTY OF EVIDENCE	Very low	Low	**Moderate**	High			No included studies
VALUES	Important uncertainty or variability	**Possibly important uncertainty or variability**	Probably no important uncertainty or variability	No important uncertainty or variability			
BALANCE OF EFFECTS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	**Favours the intervention**	Varies	Don't know
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	**Varies**	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	Very low	Low	**Moderate**	High			No included studies
COST EFFECTIVENESS	Favours the comparison	Probably favours the comparison	Does not favour either the intervention or the comparison	Probably favours the intervention	Favours the intervention	Varies	**No included studies**

	JUDGEMENT						
EQUITY	Reduced	Probably reduced	Probably no impact	Probably increased	**Increased**	Varies	Don't know
ACCEPTABILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know
FEASIBILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know

Type of recommendation

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	**Strong recommendation for the intervention**
○	○	○	○	●

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Back to question list