



# Postpartum Maternal and Newborn Healthcare

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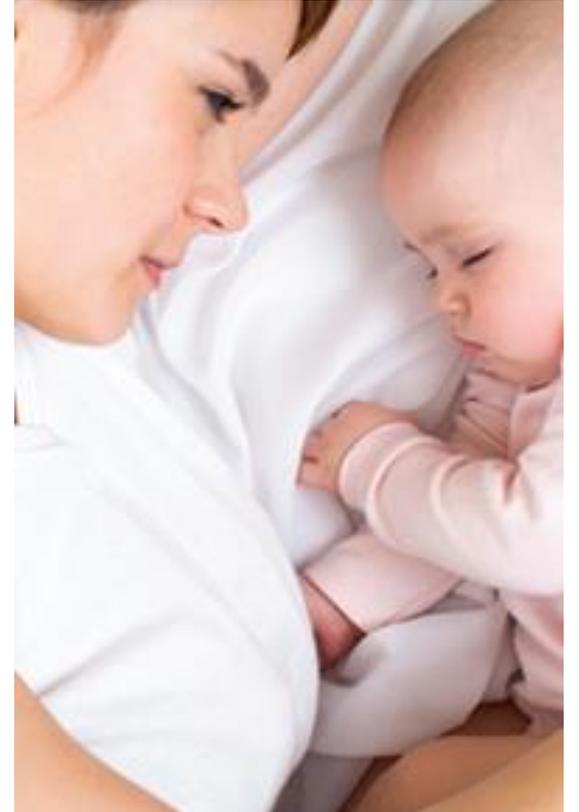
# Postpartum Maternal Healthcare

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# “Fourth trimester”

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The **postpartum** (or postnatal) period begins immediately after childbirth as the mother's body, including hormone levels and uterus size, returns to a non-pregnant state. The terms **puerperium** (“zuo yuezi in China”), puerperal period, or immediate postpartum period are commonly used to refer to the first six weeks following childbirth.



# Importance

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- ❑ Mothers will experience many changes, both physically and emotionally
- ❑ The period soon after childbirth poses substantial health risks for both mother and newborn infant.
- ❑ Yet the postpartum and postnatal period receives less attention from health care providers than pregnancy and childbirth.
- ❑ Obtaining superior postpartum care services can protect both the new mother and the baby

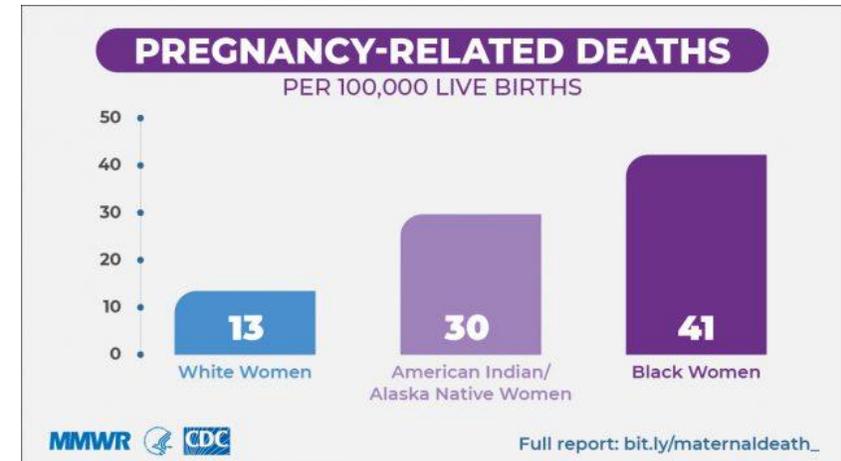
# Importance

## Pregnancy-Related Deaths-United States, 2011-2015:

about 1/3 of deaths (31%) happened during pregnancy;

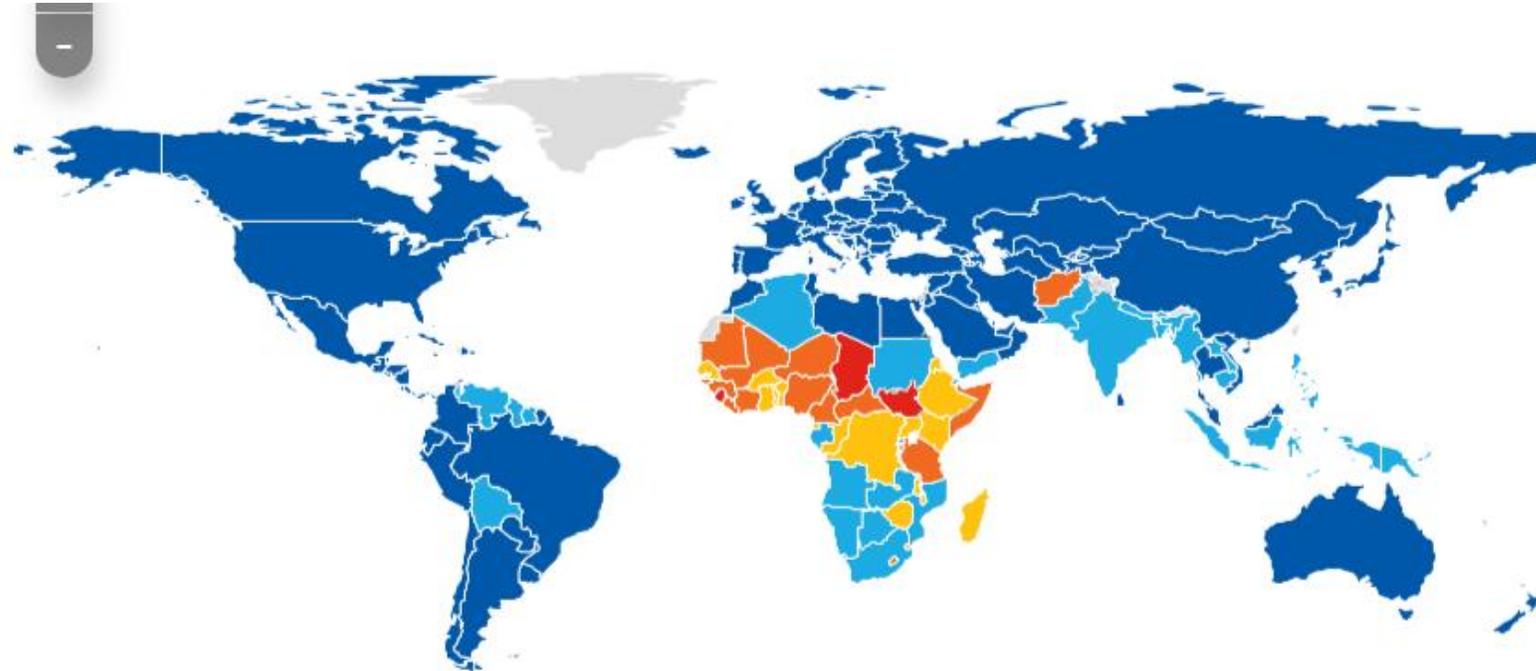
about 1/3 (36%) happened at delivery or in the week after; and

about 1/3 (33%) happened 1 week to 1 year postpartum



# Importance

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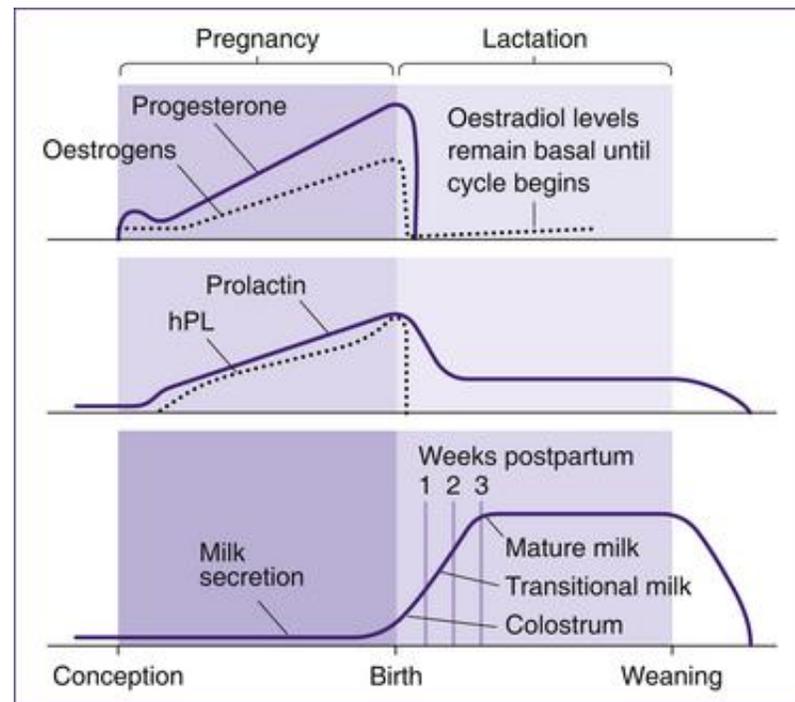


● Very Low (<100) ● Low (100-299) ● High (300-499) ● Very High (500-999) ● Extremely High (>1000)

**Maternal Mortality Ratio, (maternal deaths per 100,000 live births)**

# Lactation Physiology

## □ Hormonal Changes



**The return of the body systems to a non-pregnant state is largely governed by the removal of the placental hormones. Following birth of the placenta, metabolism of circulating hormones and hormone stores results in a rapid drop in placental hormone levels.**

# Lactation Physiology

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## □ Menstrual resumption

**The onset of the first menstrual period following delivery is variable and depends if the mother is lactating or not. If the mother is not breastfeeding, then the menstrual function returns by 6-8th week postpartum in most of the cases. In lactating females, the menstruation usually reappears in 4 to 5 months, and in some cases, can be as late as 24 months.**

# Lactation Physiology

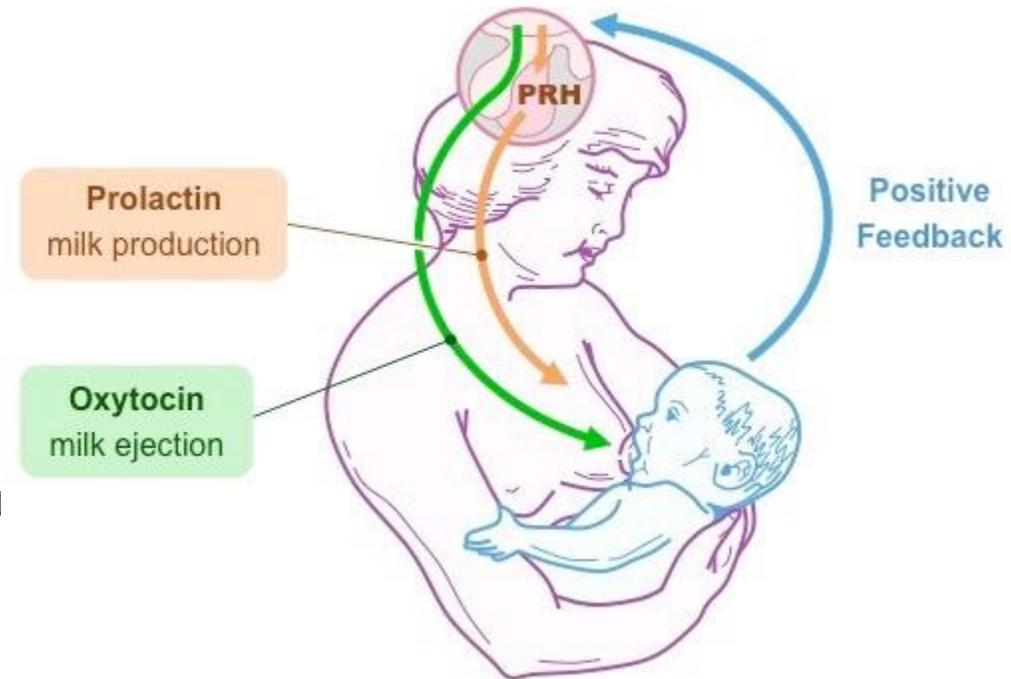
## □ Lactogenesis

Breast milk production, or lactogenesis, is classically described as occurring in three stages

**Lactogenesis I:** the first few days postpartum, milk begins to form, and the lactose and protein content of milk increase.

**Lactogenesis II:** This stage begins 2–5 days postpartum and is marked by increased blood flow to the mammary glands.

**Lactogenesis III:** This stage of breast milk production begins about 10 days after birth and is the stage in which the milk composition becomes stable.



# Lactation Physiology

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## □ Involution of the uterus

The uterus reduces in size immediately following birth, due to myometrial contractions, and then continues to reduce in size over the next few days and weeks, until it returns to being a pelvic organ. This process is termed involution.

# Lactation Physiology

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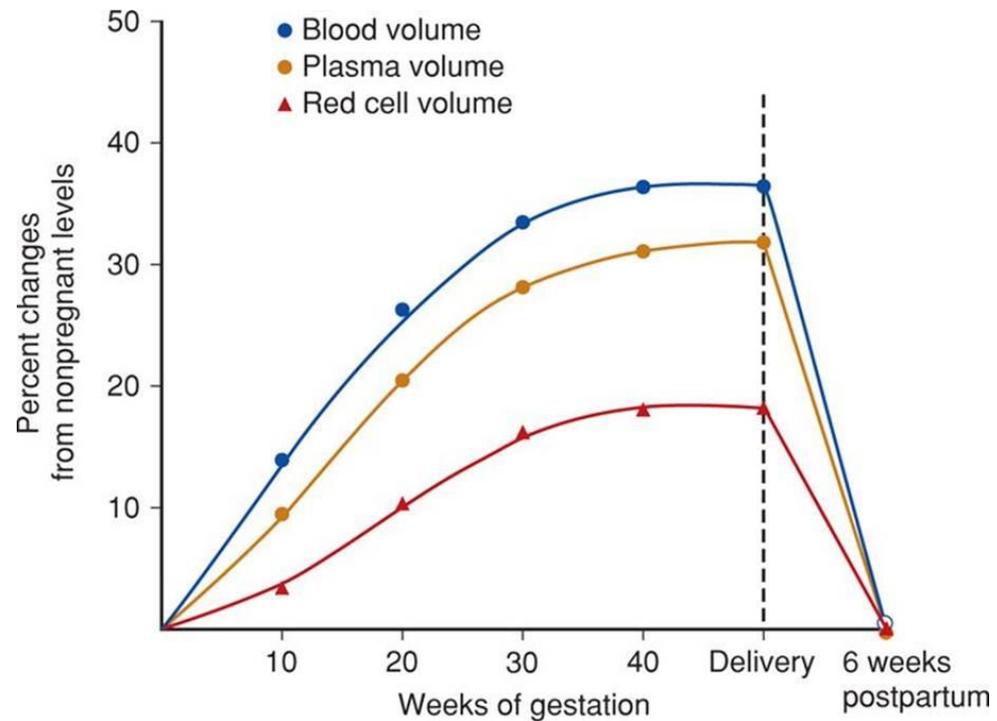
## □ Lochia

**Lochia refers to the discharge from the vagina that continues over the 3–6 weeks following birth. Lochia changes in appearance over time, and between 150 mL and 400 mL of lochia can be lost in total. Composed of blood, shreds of fetal membranes, decidua, vernix caseosa, lanugo and membranes**

	COLOR	IT LASTS...
<b>RUBRA</b>	Dark red	3 – 4 days
<b>SEROSA</b>	Pinkish brown	4 – 10 days
<b>ALBA</b>	Whitish yellow	10 – 28 days

# Lactation Physiology

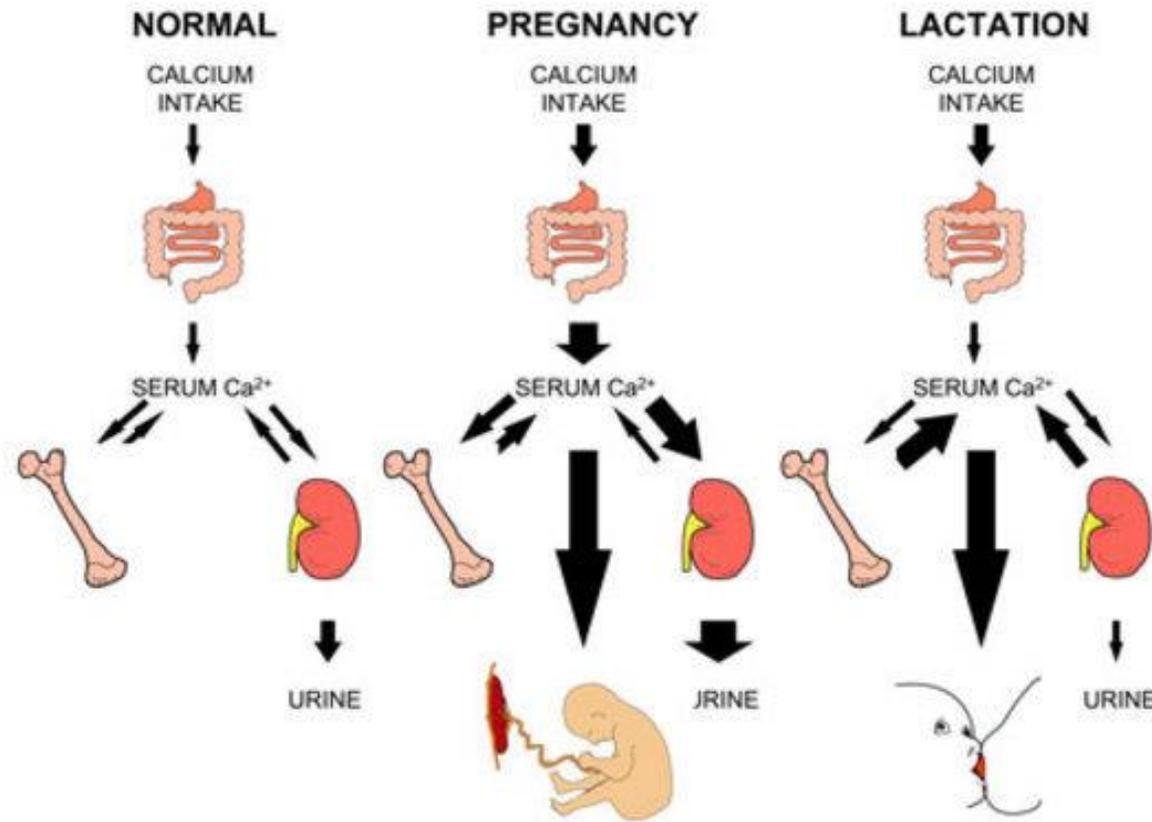
## □ Cardiovascular Changes



**Changes in total blood volume and its components (plasma and red cell volumes) during pregnancy and postpartum.**

# Lactation Physiology

## □ Bone Density



# Lactation Physiology

## □ Bone Density

Can calcium supplementation during lactation effectively prevent bone loss?

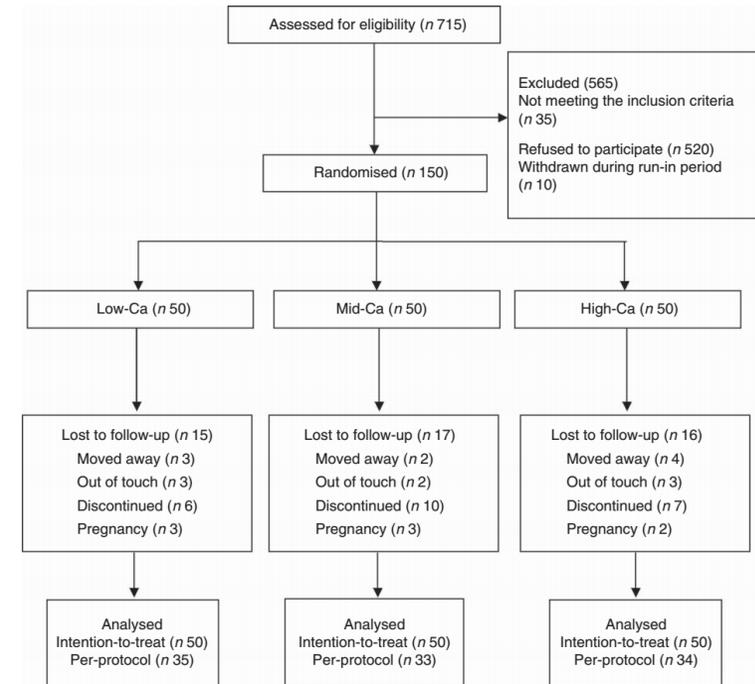
Our study:

RCT design

Low-Ca: 769mg/d

Mid-Ca: 1067mg/d

High-Ca: 1267 mg/d



Flow chart of the participants

# Lactation Physiology

## □ Bone Density

Table 3 The baseline and percent changes (intention-to-treat analysis) of BMD (mg/cm<sup>2</sup>) between baseline and 12 mo.

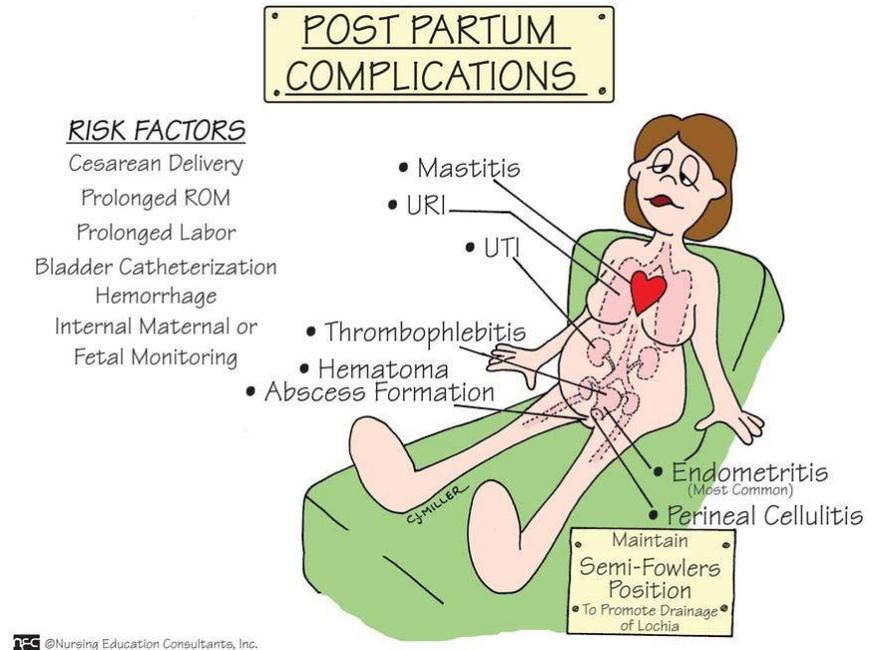
	Low-Ca (n=50)		Mid-Ca (n=50)		High-Ca (n=50)		P <sup>†</sup>
	Baseline	Change (%)	Baseline	Change (%)	Baseline	Change (%)	
Total body	1.090 ± 0.059	-0.70 (-1.25,-0.15)	1.093 ± 0.059	-0.33 (-0.83,0.16)	1.088 ± 0.079	-0.31 (-0.73,0.12)	0.451
Spine	1.083 ± 0.112	1.21 (-0.12,2.54)	1.069 ± 0.098	1.13 (0.11,2.11)	1.066 ± 0.119	1.32 (0.07,2.57)	0.973
Left hip							
Total	0.942 ± 0.084	-1.12 (-1.85,-0.39)	0.944 ± 0.098	-0.89 (-1.52,-0.27)	0.923 ± 0.123	-0.68 (-1.69,0.34)	0.739
Femoral neck	0.922 ± 0.079	-1.57 (-2.33,-0.82)	0.915 ± 0.11	-0.93 (-1.62,-0.23)	0.897 ± 0.115	-0.74 (-1.90,-0.43)	0.381
Trochanter	0.733 ± 0.078	-1.34 (-2.68,-0.01)	0.743 ± 0.092	-1.02 (-1.82,-0.22)	0.712 ± 0.116	-0.68 (-2.24,0.88)	0.761
Ward's triangle	0.843 ± 0.115	-2.95 (-4.11,-1.78)	0.835 ± 0.131	-2.76 (-4.06,-1.46)	0.82 ± 0.154	-1.96 (-3.55,-0.36)	0.594

<sup>†</sup>Values were derived by ANOVA

Zheqing Zhang et al, British Journal of Nutrition. 2016, 115(1):24-31

# Complications during Postpartum

1. Postpartum hemorrhage
2. Infectious complications
3. Breast-related complications
4. Urine leakage
5. Psychological disorders
6. Postpartum weight retention



# Postpartum Complications and Healthcare

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## 1. Postpartum hemorrhage (PPH)

**Early postpartum haemorrhage** is defined as bleeding that occurs within 24 hours (usually immediately) after delivery of the placenta. The volume exceeds the normal 500 ml third stage blood loss.

**Late or secondary PPH** occurs between 24 hours and 6 weeks postpartum and occurs in about 1% of women postpartum. Bleeding most commonly occurs between 8 and 14 days after delivery.

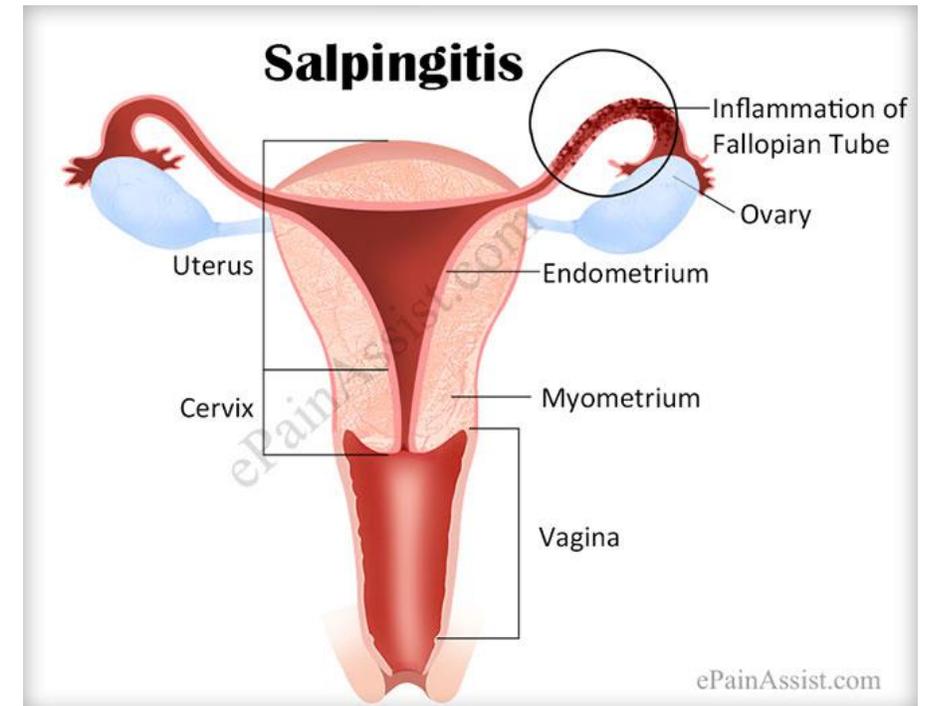
Most deaths resulting from PPH occur during the first 24 hours after birth: the majority of these could be avoided through the use of prophylactic uterotonics during the third stage of labour and by timely and appropriate management.

# Postpartum Complications and Healthcare

## 2. Infectious complications

- ✓ Postpartum endometritis and salpingitis
- ✓ Pelvic abscess or peritonitis
- ✓ Other infectious complications
  - Abscess after caesarean section.
  - Lymphangitis and breast abscess
  - Pyelonephritis

Look for an infection in patients with fever higher than 38°C for more than 48 hours.  
Admit to inpatient department; administer antibiotherapy



# Postpartum Complications and Healthcare

## 3. Breast-related complications

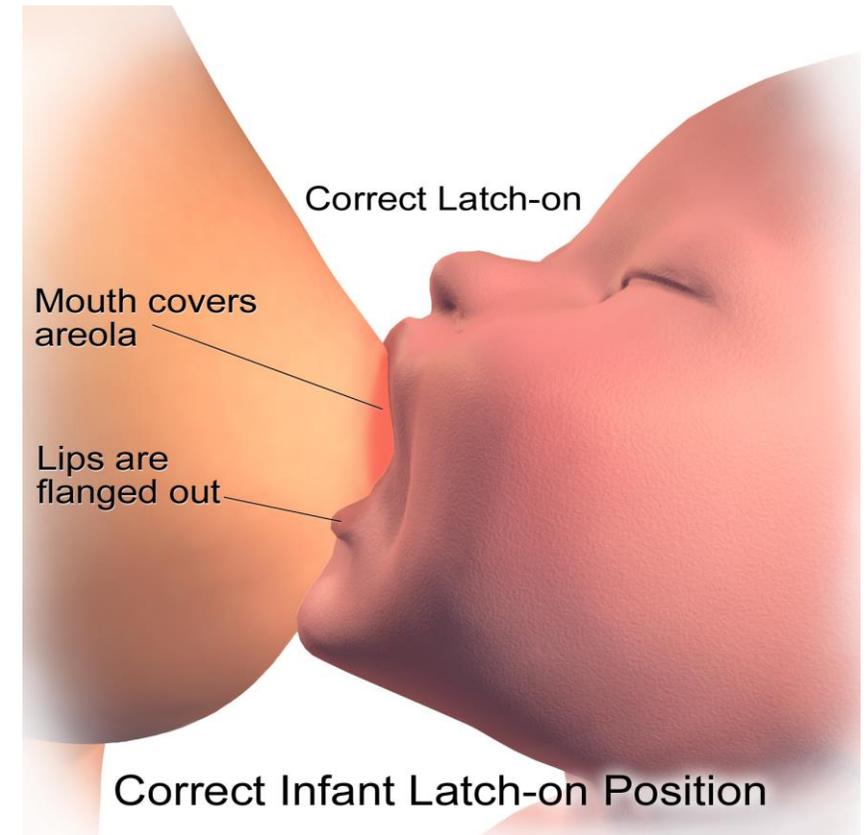
### ❑ Cracked nipples

#### † Clinical features

- Nipple erosion and intense pain when starting to nurse.
- No fever (except when associated with lymphangitis).

#### † Management

- Clean with soap and clean water before and after each feeding; dry carefully.
- Observe the neonate while nursing, and correct the position if necessary. Cracked nipples are often caused by incorrect latching onto the breast



# Postpartum Complications and Healthcare

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## □ Breast engorgement

### † Clinical features

- Bilateral pain 2 to 3 days after childbirth; firm, painful breasts.

### † Management

- Cold or warm compresses (before nursing); more frequent nursing.
- Gentle manual expression before nursing, if the neonate cannot latch onto the overly distended breast or after nursing to finish emptying the breast.

Engorgement subsides in 24 to 48 hours.

# Postpartum Complications and Healthcare

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## □ Lymphangitis

### † Clinical features

- Unilateral pain, 5 to 10 days after childbirth. Local inflammation, red, hot painful with no fluctuation.
- High fever (39-40 °C); enlarged axillary lymph node.
- No pus in the milk collected on a compress.

### † Management

- Empty the breast by nursing the neonate frequently on the involved side. If the mother finds nursing too painful, temporarily stop nursing on the painful side (but empty the breast manually) and continue breastfeeding with the other breast.
- Routine analgesia

# Postpartum Complications and Healthcare

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## □ Breast infections (mastitis, abscess)

### † Clinical features

- Mastitis:
  - Firm, red, painful, swollen area of one breast associated with fever.
  - Axillary lymph node may be enlarged.
  - Purulent discharge from the nipple.
- Breast abscess: fluctuant, tender, palpable mass.

### † Management

- Temporarily stop nursing on the affected side. Carefully express all milk from the infected breast (manually).
- Routine analgesia (paracetamol PO); cold or warm compresses.
- Antibiotherapy with activity against staphylococci may prevent progression to breast abscess (cloxacillin PO: 1 g 3 times daily for 7 days).
- Breast abscess: urgent drainage as the abscess can quickly spread, and antibiotherapy as above.

# Postpartum Complications and Healthcare

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## 4. Urine leakage

† Postpartum urinary incontinence — the involuntary leaking of urine that new moms often experience, usually while laughing, sneezing, coughing, or performing any strenuous activity — is very common after giving birth. In fact, more than a third of moms spring that particular link

† Propose exercises to strengthen the pelvic floor



# Postpartum Complications and Healthcare

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## 5. Psychological disorders

### □ Postpartum blues

† also known as “baby blues” or “maternity blues,” is a phase of emotional lability following childbirth, characterized by frequent crying episodes, irritability, confusion, and anxiety. However, elation might also be observed during the first few days following childbirth

† These problems generally diminish within a few days. Reassurance, family support and follow-up to ensure that the patient does not develop depression are usually sufficient.

# Postpartum Complications and Healthcare

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## □ Postpartum depression

† Postpartum depression develops in the first weeks after childbirth; it can be severe and is often underestimated.

† Prevalence—Results from a systematic review and meta-analysis

Across 15,895 articles, 58 articles (N = 37,294 women) were included in the review. The incidence of postpartum depression was 12% [95% CI 0.04-0.20] while the overall prevalence of depression was 17% [95% CI 0.15-0.20] among healthy mothers without a prior history of depression.

# Postpartum Complications and Healthcare

## □ Postpartum depression

- † The characteristic symptoms of depression are sadness, frequent crying, loss of self-confidence, constant concerns about the child (or, on the contrary, a feeling of indifference), feeling incompetent as a mother, and feelings of guilt (or even aggressive thoughts toward the child) combined with insomnia and loss of appetite. These symptoms last more than 2 weeks and gradually worsen, leading to a state of exhaustion.
- † The interview should look for possible suicidal thoughts and assess the mother's ability and desire to take care of the child (depression can have repercussions for the child's development).
- † An understanding and reassuring attitude and help with daily activities by family and friends are essential.
- † Antidepressant medication may be necessary (choose an antidepressant compatible with breastfeeding, which should be continued whenever possible).



# Postpartum Complications and Healthcare

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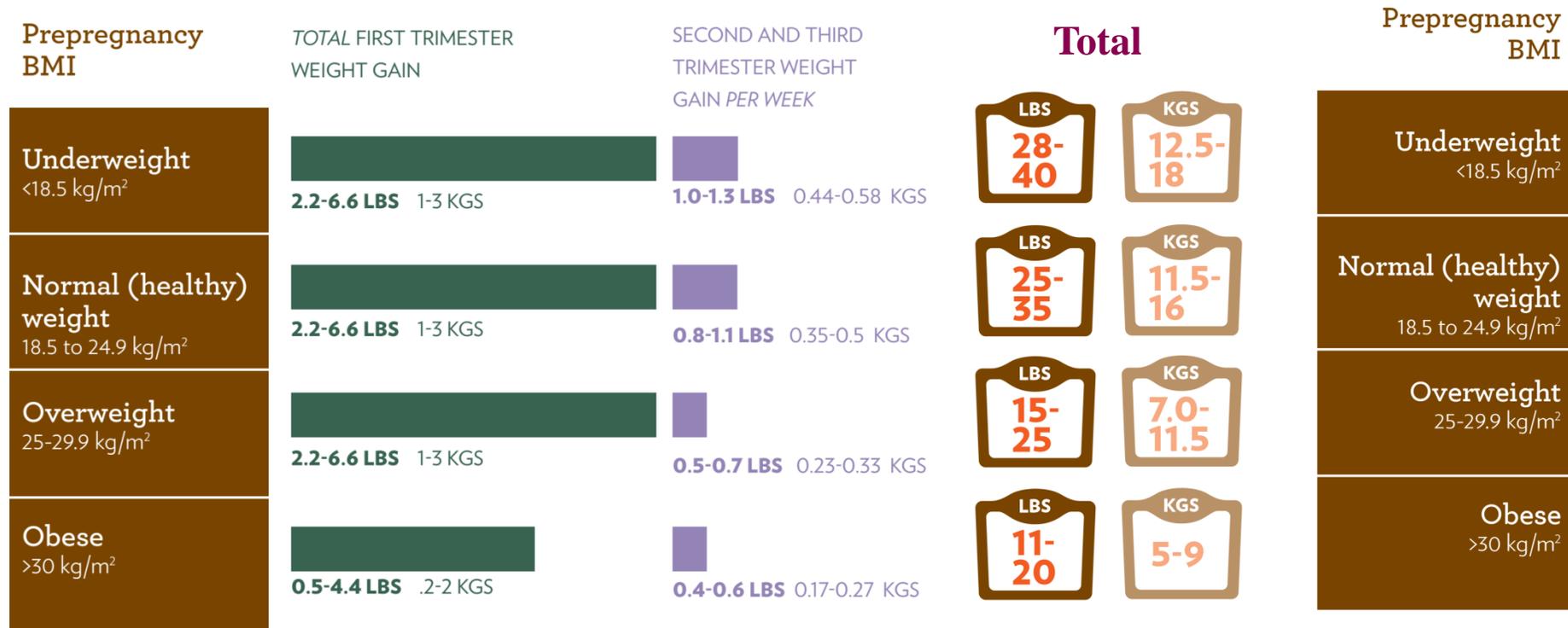
## □ Postpartum psychosis

- † This occurs less frequently and is characterised by the onset of psychotic symptoms after childbirth.
- † Symptoms include irritability, major mood swings, delusions, hallucinations, and disorganised, bizarre and sometimes violent behaviour.
- † The patient should be sent to a doctor immediately. Antipsychotic treatment, and usually hospitalisation, is necessary

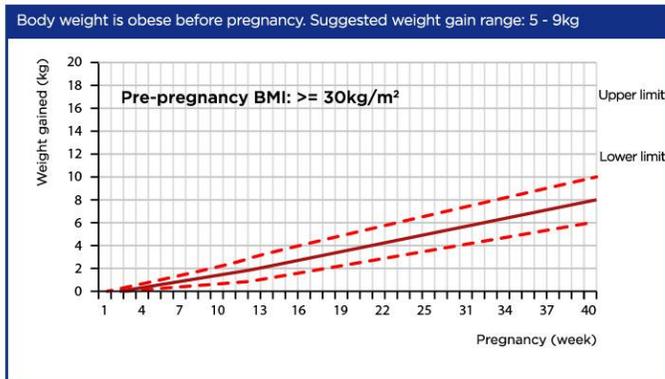
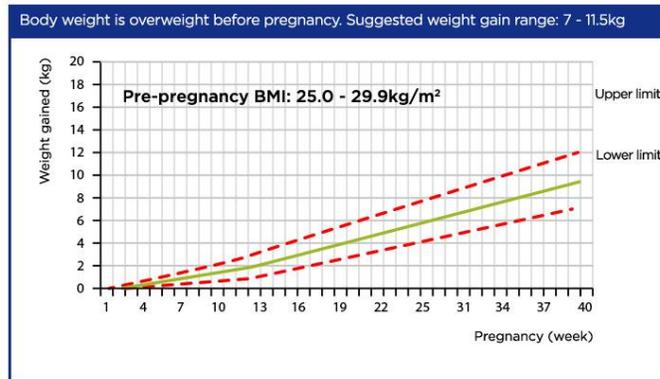
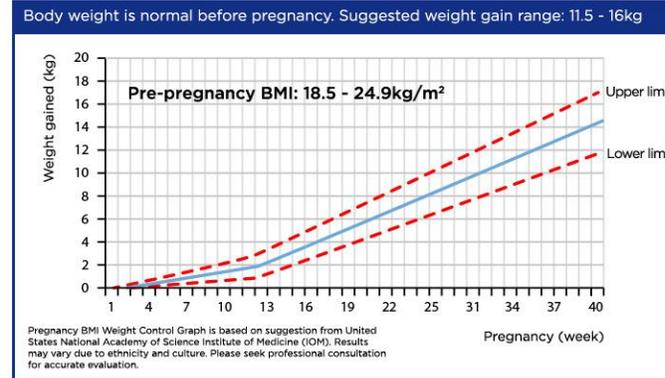
# Postpartum Complications and Healthcare

## 7. Postpartum weight retention

### 2009 IOM/NRC recommendations



# Postpartum Complications and Healthcare



# Postpartum Complications and Healthcare

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**Table 2: Strategies for Multilevel Interventions for Weight Management in Postpartum Women**

Individual Strategies

Assure women that physical activity and appropriate intake have no adverse effects on lactation

Teach women about physical activity and positive growth of newborn

Interpersonal Strategies

Social support through group participation

Capitalize on cultural factors that contribute to diet and physical activity patterns

Capitalize on family eating times and places and plan family meals with high nutrition content

Community Strategies

Help postpartum women locate safe places to walk, exercise in neighborhoods

Help women map walking routes to parks, schools in neighborhoods

Keller et al. J Obstet Gynecol Neonatal Nurs. 2008 Jan-Feb;37(1):71-9.

# Postpartum Complications and Healthcare

Table 2

Health benefits during postpartum by country-specific guidelines

Characteristics of guidelines	Australia	Canada	Norway	United Kingdom	United States (ACOG)	United States (USDHHS)
<u>Stated Health Benefits:</u>						
Improved mental health or mood	yes			yes		yes
Improved emotional well-being	yes					
Weight loss and/or maintenance				yes		yes
Cardiorespiratory fitness	yes			yes		yes
Reduce postpartum depression	yes			yes	yes	
Reduce anxiety				yes		
<u>Activities that will not affect breast milk volume, breast milk composition, or infant growth:</u>						
Sporting activities	yes*					
Moderate exercise		yes		yes		
Moderate physical activity						yes
Moderate to vigorous physical activity			yes			

\* As long as there is appropriate food and fluid intake.

Kelly et al. Obstet Gynecol Surv. 2014 July ; 69(7): 407–414.

# Postpartum Complications and Healthcare

**Table 3**

Exercise prescription during postpartum by country-specific guidelines

Characteristics of guidelines	Australia	Canada	Norway	United Kingdom	United States (USDHHS)
Frequency		3-5 times/week			spread throughout the week**
Duration or total time		>=15 minutes/session			>=150 minutes/week**
Intensity		use conventional heart rate and ratings of perceived exertion targets		do not resume high impact activity too soon	moderate intensity recommended**
Type of activities:					
Aerobic activities	yes*	yes			yes
Non-ballistic exercises	yes*				
Pelvic floor exercise		yes	yes	yes	
Running	yes*				
Strengthening		yes			yes
Stretching		yes		yes	
Swimming			yes		
Walking		yes		yes	

\* Specified to delay these activities until there is resolution of some of the hormonal and physical effects of pregnancy and childbirth (usually about 6 weeks postpartum).

\*\* Among women who are not already highly active or doing vigorous intensity physical activity.

Note: Exercise prescription during postpartum was not covered by the United States ACOG guidelines.

# Postpartum Complications and Healthcare

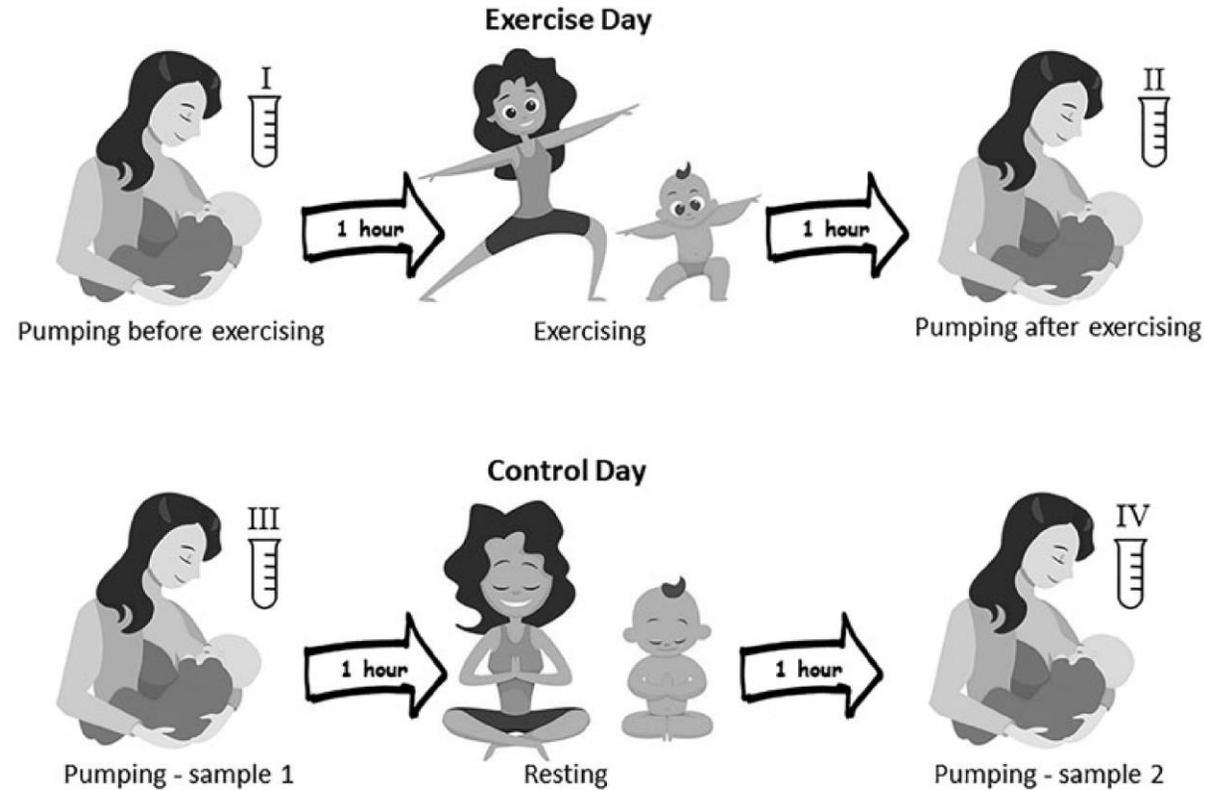


FIG. 1. Study design.

# Postpartum Complications and Healthcare

## Does physical activity affect milk composition or volume?

TABLE 2. MACRONUTRIENTS AND MILK VOLUME DATA

	<i>Day of PA</i>			<i>Control day without PA</i>		
	<i>Before PA</i>	<i>After PA</i>	<i>p</i>	<i>Sample 1</i>	<i>Sample 2</i>	<i>p</i>
Protein (g/100 mL), <i>n</i> = 29	0.8 ± 0.2 (0.4–1.2)	0.8 ± 0.2 (0.3–1.4)	NS	0.8 ± 1.3 (0.7–1.1)	0.8 ± 0.2 (0.4–1.2)	NS
Fat (g/100 mL), <i>n</i> = 31	3.7 ± 1.3 (1.4–5.8)	4.1 ± 1.5 (1.1–7.8)	NS	3.9 ± 1.3 (1.2–6.6)	4.3 ± 1.7 (1.8–9.6)	NS
Lactose (g/100 mL), <i>n</i> = 31	7.7 ± 0.7 (4.6–8.7)	7.8 ± 0.3 (7.1–8.5)	NS	7.7 ± 0.8 (3.8–8.4)	7.7 ± 0.5 (5.4–8.3)	NS
Energy (kcal/100 mL), <i>n</i> = 31	65 ± 11.5 (38–85)	70 ± 12.7 (45–99)	NS	66.4 ± 11.8 (40–90)	70.6 ± 13.5 (48–113)	NS
Milk volume (cc), <i>n</i> = 23	84.4 ± 13.7 (20–360)	54.6 ± 30.8 (20–130)	0.026	83 ± 73.3 (10–330)	47.5 ± 21.8 (20–100)	0.03

Data are presented as mean ± SD, range.  
NS, not significant; PA, physical activity.

# Postpartum Complications and Healthcare

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# Guidelines for Postpartum Healthcare

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## PROVISION OF POSTNATAL CARE TO MOTHERS AND NEWBORNS

### RECOMMENDATION 1: Timing of discharge from a health facility after birth

After an uncomplicated vaginal birth in a health facility, healthy mothers and newborns should receive care in the facility for at least 24 hours after birth.

### RECOMMENDATION 2: Number and timing of postnatal contacts

- If birth is in a health facility, mothers and newborns should receive postnatal care in the facility for at least 24 hours after birth.
- If birth is at home, the first postnatal contact should be as early as possible within 24 hours of birth.
- At least three additional postnatal contacts are recommended for all mothers and newborns, on day 3 (48–72 hours), between days 7–14 after birth, and six weeks after birth.

### RECOMMENDATION 3: Home visits for postnatal care

Home visits in the first week after birth are recommended for care of the mother and newborn.

# Guidelines for Postpartum Healthcare

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## CONTENT OF POSTNATAL CARE FOR THE MOTHER

### RECOMMENDATION 8: Assessment of the mother

#### First 24 hours after birth

- All postpartum women should have regular assessment of vaginal bleeding, uterine contraction, fundal height, temperature and heart rate (pulse) routinely during the first 24 hours starting from the first hour after birth.
- Blood pressure should be measured shortly after birth. If normal, the second blood pressure measurement should be taken within six hours.
- Urine void should be documented within six hours.

#### Beyond 24 hours after birth

At each subsequent postnatal contact, enquiries should continue to be made about general well-being and assessments made regarding the following: micturition and urinary incontinence, bowel function, healing of any perineal wound, headache, fatigue, back pain, perineal pain and perineal hygiene, breast pain, uterine tenderness and lochia.

# Guidelines for Postpartum Healthcare

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## **RECOMMENDATION 9: Counselling**

All women should be given information about the physiological process of recovery after birth, and that some health problems are common, with advice to report any health concerns to a health care professional

Women should be counselled on nutrition, hygiene, safer sex, et al

## **RECOMMENDATION 10: Iron and folic acid supplementation**

Iron and folic acid supplementation should be provided for at least three months

## **RECOMMENDATION 11: Prophylactic antibiotics**

The use of antibiotics among women with a vaginal delivery and a third or fourth degree perineal tear is recommended for prevention of wound complications.

## **RECOMMENDATION 12: Psychosocial support**

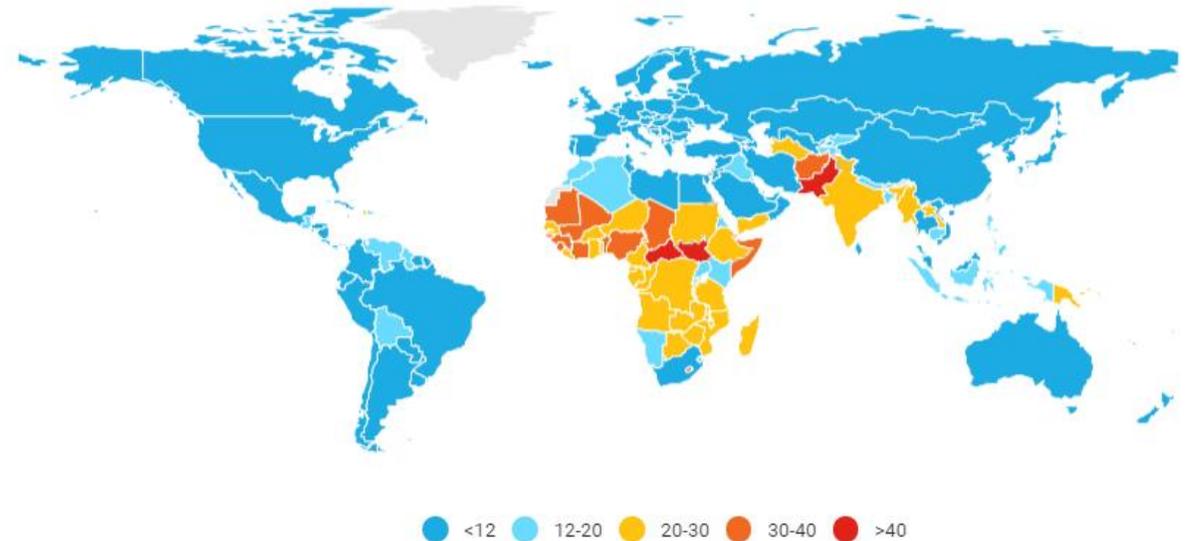
# Postpartum Newborn Healthcare

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# Importance

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- **The first 28 days of life – the neonatal period – is the most vulnerable time for a child’s survival.**
- **Children face the highest risk of dying in their first month of life at an average global rate of 18 deaths per 1,000 live births in 2018.**



Source: United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) 2019

# Guidelines for Postpartum Healthcare

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## CONTENT OF POSTNATAL CARE FOR THE NEWBORN

### RECOMMENDATION 4: Assessment of the baby

The following signs should be assessed during each postnatal care contact and the newborn should be referred for further evaluation if any of the signs is present:

stopped feeding well, history of convulsions, fast breathing (breathing rate  $\geq 60$  per minute), severe chest in-drawing, no spontaneous movement, fever (temperature  $\geq 37.5$  °C), low body temperature (temperature  $< 35.5$  °C), any jaundice in first 24 hours of life, or yellow palms and soles at any age.

The family should be encouraged to seek health care early if they identify any of the above danger signs in-between postnatal care visits.

# Guidelines for Postpartum Healthcare

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## **RECOMMENDATION 5: Exclusive breastfeeding**

All babies should be exclusively breastfed from birth until 6 months of age. Mothers should be counselled and provided support for exclusive breastfeeding at each postnatal contact.

## **RECOMMENDATION 6: Cord care**

Daily chlorhexidine (7.1% chlorhexidine digluconate aqueous solution or gel, delivering 4% chlorhexidine) application to the umbilical cord stump during the first week of life is recommended for newborns who are born at home in settings with high neonatal mortality (30 or more neonatal deaths per 1000 live births).

Clean, dry cord care is recommended for newborns born in health facilities and at home in low neonatal mortality settings.

## **RECOMMENDATION 7: Other postnatal care for the newborn**

Bathing, Appropriate clothing, immunization, communication, Vitamin K, vitamin D, et al

Thank you

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