



## Union Cycliste Internationale (UCI) Cycling Pregnancy and Postpartum Guidance

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## SUMMARY

Practical information is needed on the extent to which elite and competitive female athletes can continue to train and compete safely during pregnancy, without risk for themselves or their child, as well as advice for the post-partum period, including breastfeeding. Such information is also needed to recommend cycling for non-athlete women who wish to exercise. For this reason, the International Cycling Union (UCI) has produced this guide to provide information for all those who participate in recreational cycling activities and UCI-sanctioned competitions during pregnancy. This policy has been developed utilising the AGREE II instrument and has had input from elite female cyclists, including those who have come back to compete following pregnancy.

Supported by clinical evidence, the UCI encourages women to continue cycling throughout their pregnancy. Although cycling exercise is generally safe during pregnancy, some general principles are required for women, especially when cycling in the heat. No competitive cycling events included in the UCI calendar are possible beyond the 1<sup>st</sup> trimester of pregnancy, mainly to prevent the risk of trauma to the uterus and foetus in the event of an accident. The UCI encourages pregnant women to participate in recreational/leisure cycling as a form of physical activity throughout their pregnancy, but the ability to participate in organised recreational activities is only possible up to the end of the 1<sup>st</sup> trimester.

Exercise, and especially cycling exercise, should be viewed as an important component to improve women's psychological health and common complaints during the postpartum period. Breast-feeding is highly recommended when women return to exercise and there is no impact of exercise on the quantity and quality of breast milk.

**Keywords.** Sports participation – Recreational activity - Exercise – Bicycling - Cycling - Health – Lactation – Heat

## RESUME

Il est important d'apporter des informations pratiques aux athlètes féminines d'élite et de compétition afin de savoir si elles peuvent continuer à s'entraîner et à concourir en toute sécurité pendant la grossesse, sans risque pour elles-mêmes ou pour leur enfant. Des conseils sont aussi importants pour informer sur les bonnes pratiques pendant la période du post-partum et de l'allaitement. Ces informations sont également utiles pour recommander la pratique du vélo aux femmes non sportives qui souhaitent faire de l'exercice. C'est pourquoi l'Union cycliste internationale (UCI) a élaboré ce guide afin de fournir des informations à toutes celles qui participent à des activités cyclistes de loisir ou à des compétitions placées sous l'égide de l'UCI pendant leur grossesse. Cette politique a été élaborée à l'aide de l'instrument AGREE II et a bénéficié de la contribution de cyclistes d'élite, y compris celles qui ont repris la compétition après une grossesse.

L'UCI encourage les femmes à continuer à faire du vélo pendant leur grossesse, preuves cliniques à l'appui. Bien que la pratique du vélo soit généralement sans danger pendant la grossesse, certains principes généraux s'imposent aux femmes, en particulier lorsqu'elles pratiquent le cyclisme en période de chaleur. Aucune compétition cycliste inscrite au calendrier de l'UCI n'est envisageable au-delà du premier trimestre de la grossesse, principalement pour éviter le risque de traumatisme de l'utérus et du fœtus en cas d'accident. Pour la population générale, l'UCI encourage les femmes enceintes à pratiquer le cyclisme de loisir comme forme d'activité physique, et ce tout au long de leur grossesse. Cependant, la participation à des activités de loisir placées sous la responsabilité d'organisateur n'est possible que jusqu'à la fin du premier trimestre.

L'exercice, et en particulier le cyclisme, doit être considéré comme un élément important pour améliorer la santé psychologique des femmes et répondre aux plaintes psychologiques qui sont courantes pendant la période du post-partum. L'allaitement est aussi fortement recommandé lorsque les femmes reprennent l'exercice et il n'y a pas d'impact notable de l'exercice sur la quantité et la qualité du lait maternel.

**Mots-clés.** Pratique du sport – Activités de loisir - Exercice –Cyclisme - Santé – Allaitement – Chaleur

## **INTRODUCTION**

This policy has been developed utilising the AGREE II instrument and with input from female cyclists, including those who have returned to cycling following a pregnancy [1].

Numerous observational and interventional clinical studies, as well as meta-analyses, show that physical activity (PA) during pregnancy can be considered as beneficial and safe for the mother and foetus [2,3]. Recent studies show that the most common activities performed at least twice weekly during pregnancy by non-athlete women are brisk walking and bicycling [4,5]. Thus, practical information is needed regarding how people can safely undertake cycling activities during their pregnancy and the postpartum periods, which is the explicit aim of this policy.

Moreover, an increasing number of elite and competitive amateur female athletes are reaching their career peak during the period of optimal fertility and therefore becoming pregnant during their competitive cycling careers [6]. However, there is only sparse evidence and anecdotal reports of best-practice recommendations to help handle this issue in elite female athletes. There is a lack of direct evidence for female athletes and gaps in knowledge regarding the safe cycling frequency, duration and intensity of training and competition. Practical information is required on the extent elite and competitive amateur female athletes can continue to train and compete safely during their pregnancy, without risk for themselves and their child [7], as well as guidance during the postpartum, including lactation, period.

Therefore, this guidance has been developed by the Union Cycliste Internationale (UCI) to provide information for all those participating in recreational cycling activities as well as UCI sanctioned competitive events during their pregnancy. All participants in and organisers of cycling events should be aware of this guidance. This document does not replace medical advice given to the individual, and it is always recommended that an individual consults with their Doctor prior to exercising whilst pregnant, particularly if the woman starts a new exercise programme that she did not perform before the pregnancy.

## **EXPECTED BENEFICIAL EFFECTS FOR THE MOTHER AND THE FOETUS**

The UCI encourages women to continue to participate in cycling throughout their pregnancy, where they feel they are able to and when they are adhering to the general principles for exercising during pregnancy. The UCI also recognises the health benefits associated with continuing to exercise throughout pregnancy for the mum [2,7]. Indeed, there are many positive effects of moderate-intensity exercise during pregnancy for both the mother and the unborn child(ren), including reduction of the risk of caesarean delivery, gestational diabetes mellitus, hypertensive disorders of pregnancy, pre-eclampsia, excessive gestational weight gain, lumbopelvic pain, preterm birth, improvement of well-being and self-perception [5,8,9]. Two recent scientific reviews demonstrate that maternal PA during pregnancy positively influences total neurodevelopment and specifically language development in children, especially during their first 18 months [10,11]. Endurance training also increases the uteroplacental blood flow at rest by promoting vascular remodeling and angiogenesis in the umbilical and uterine arteries [12-14].

## **GENERAL PRINCIPLES FOR EXERCISING WHEN PREGNANT**

Exercise is generally safe during your pregnancy. Current recommendations state that healthy pregnant women should engage in at least 150 minutes of moderate-intensity aerobic activity

each week [3,15,16]. Muscle strengthening activities, with a modest to moderate load using elastic belts, involving both upper and lower limbs, should also be undertaken when pregnant [17]. Cycling is an ideal moderate intensity exercise, and the preferred types of exercise before and during pregnancy are bicycling, brisk walking, Nordic walking, running, etc. [4,5,18].

General principles for women exercising when pregnant, in-keeping with current government physical activity guidelines, e.g. the United Kingdom government, are [19,20],

- ‘Don’t bump the bump’ – consider the risk of falls and potential injury to you and the unborn child(ren) from any potential trauma;
- Exercise during pregnancy is generally good for you and the unborn child;
- Listen to your body and adapt your exercise accordingly;
- Be extra cautious when exercising in the heat (ambient temperature >25°C and relative humidity above 45%) – aim to keep cool, comfortable and hydrated when exercising; and,
- Generally avoid exercising for periods of greater than 1 hour at any one time.

### **WARNING SIGNS FOR PREGNANT WOMEN WHEN EXERCISING**

Warning signs for pregnant women to immediately stop exercising and seek immediate medical review, include [21]:

- Vaginal bleeding
- Abdominal pain
- Regular painful contractions
- Amniotic fluid leakage
- Short of breath (dyspnoea) before exertion
- Dizziness
- Headache
- Chest pain
- Muscle weakness affecting balance
- Calf pain or swelling

These are also warning signs for the pregnancy if they occur at rest and the individual should again seek immediate medical review in these circumstances.

### **The advice to be cautious when exercising in the heat**

Pregnant women may safely engage in exercise for up to 35 minutes at intensities up to 90% of their maximum heart rate in ambient conditions not exceeding 25°C and 45% relative humidity without reaching a body temperature of 39°C, the hypothesised ‘teratogenic’ threshold during pregnancy, leading to potential damage to the unborn child(ren) [22]. Pregnant women are advised to avoid heat stress such as exercise in the heat, because of concern about the risk of reaching a core temperature above the proposed teratogenic threshold of 39°C. However, an enhanced thermoregulatory capacity has been hypothesised during pregnancy, which could increase the thermoprotection to the developing fetus.

### **What exercise intensity is safe during pregnancy**

Foetal bradycardia may occur when women exercise more than 90% of maximal heart rate, but heart rate normalises quickly after stopping the exercise [23]. Therefore, high-intensity aerobic exercise ( $\geq 90\%$  of the maximal maternal heart rate) is strongly discouraged because of the risk of foetal bradycardia.

## **How to grade the exercise intensity?**

Exercise intensity can be assessed via different methods [24]. For example, using the talk test, when doing moderate intensity activity, you will be able to talk but not sing. Whilst, when doing vigorous intensity activity, you will not be able to say more than a few words without pausing for a breath. An alternative method to the talk test for measuring exercise intensity is heart rate ranges, with moderate intensity physical activity being 64-76% of maximum heart rate, whilst vigorous intensity physical activity is 77-93% of maximum heart rate, with an estimate of maximum heart rate being 220 minus your age in years [25]. An alternative to the talk test and heart rate ranges for measuring exercise intensity, is the Borg Rating of Perceived Exertion (RPE), which is scored generally from 6-20, with 12-14 being moderate intensity physical activity [26].

## **PARTICIPATION**

Participation in UCI competitive events and/or recreational activities during pregnancy is at the risk of the individual. The UCI will not be held liable in the event an individual participating, whilst pregnant, suffers a miscarriage or permanent damage to themselves and/ or the unborn child. For both UCI competitive events and/or organised recreational activities when pregnant, the athlete is required to sign that they have read this guidance and that they are medically fit to compete in the event up until the 1<sup>st</sup> trimester. When signing this form, the individual should take into consideration their medical history, athletic/sporting history and the demands of the cycling discipline.

No competitive cycling events on the UCI calendar or organised recreational events, are recommended beyond the 1<sup>st</sup> trimester of pregnancy. The first trimester begins on the first day of your last period prior to becoming pregnant and lasts until the end of week 12 of the pregnancy – if you are unsure of your dates, please ask your midwife, General Practitioner and/or obstetrician to confirm this for you.

### **Recreational activity**

The UCI actively encourages women to participate in cycling throughout their pregnancy to enjoy the benefits to their mental and physical wellbeing, as well as for their child(ren). We encourage pregnant women to participate in recreational/leisure cycling as a form of physical activity throughout their pregnancy. Participants should only continue with the level of activity they did prior to pregnancy and should not increase during their pregnancy. However, the ability to participate in organised recreational activities when pregnant is only possible up to the end of the 1<sup>st</sup> trimester and the decision to participate whilst pregnant in recreational activities is only made by the participant themselves.

If the participant experiences any changes in their wellbeing whilst participating, they should stop any cycling activities and seek medical attention as soon as possible. This is the sole responsibility of the participant. Participation in an organised recreational activity shall be at the participant's own risk and the participant is not required to inform the activity provider of their pregnancy.

### **Competitive events**

For UCI sanctioned competitive cycling events when pregnant, the athlete will be required to sign a declaration that they have read and understood this guidance and that they are medically fit to

compete in the event up until the 1<sup>st</sup> trimester. This sign off should take into consideration their medical history, athletic/sporting history and the demands of the cycling discipline. No UCI sanctioned events are possible beyond the 1<sup>st</sup> trimester of the pregnancy.

The reason that no UCI sanctioned events are allowed beyond the 1<sup>st</sup> trimester is due to the potential risk of trauma to the uterus and foetus in the event of an accident beyond the 1<sup>st</sup> trimester as well as taking into consideration the advice not to exercise generally for longer than one hour at a time when pregnant, with some cycling discipline durations being beyond 1 hour. Indeed, during the second and third trimester of pregnancy (13-40 weeks) the baby moves upwards and is no longer protected by the pelvis. Due to the risks associated when competing in a competitive cycling event, there is the potential risk of harm to the baby and the mother from a fall. Stationary cycling could of course be undertaken beyond the 1<sup>st</sup> trimester as long as the women feels comfortable to do so and the duration of cycling does not exceed 1 hour at a time.

In the event the participant falls off their bike whilst competing, they must seek medical attention on site as soon as possible, and make the medical team aware of their pregnancy. Following the event, the participant should report the fall to their usual Doctor caring for them during the pregnancy.

Due to the potential harm associated with a participant competing whilst pregnant, it is recommended that a family member and/or friend aware of their circumstances, attends the event with the participant, to ensure that the participant can be given the appropriate medical attention if required.

## **POSTPARTUM AND CYCLING**

Postpartum is a period in which women experience physiological changes and undertake roles and responsibilities that they have not experienced before [27]. After giving birth, most women can return to physical activity and sporting activities by around 6 weeks.

### **Postpartum depression**

The most common mental health problem in the postpartum period is postpartum depression. This is defined as depression occurring within the 12 months after giving birth. Postpartum depression occurs in approximately 10-15% of women after childbirth. An inverse relationship was reported between physical activity (either before, during pregnancy or postpartum) and postpartum depressive symptoms [28]. Women who perform  $\geq 150$  minutes per week of moderate to vigorous physical activity in bouts  $\geq 10$  minutes at any one time during late pregnancy, have lower risks of postpartum depressive syndrome, compared to women who are not active during pregnancy [29], which has been confirmed in other studies [30]. Therefore, exercise should be an important component to promote women's psychological health during the perinatal period.

### **Common postpartum complaints**

Moreover, physical activity in the postpartum period has numerous positive effects for the mother's health, by improving weight loss, low back pain and pelvic girdle pain, pelvic floor disorders, sexual dysfunction, blood circulation, uterine recovery, the strength of abdominal and spinal muscles, and to prevent urogynecological dysfunction [27]. Therefore, women should be actively encouraged to return to physical activity and exercise, including cycling, following childbirth. Exercise in the postpartum period should start when the person feels able, starting

from a low level and slowly building this back up to the level and beyond that they participated in prior to the pregnancy.

Most women will have a medical review with their General Practitioner (GP) / family doctor by around 6-8 weeks and this is an ideal opportunity to discuss returning to regular physical activity and exercise with a medical professional. It is important to slowly build up the time/duration and intensity of the exercise, especially if the female athlete has had a period of no or reduced training following the birth of their child(ren). The 6-week time period can however vary, depending on the method of delivery (caesarean section versus normal vaginal delivery) and any complications that the female may have experienced during childbirth. Stationary cycling may allow the postpartum female athlete to start their return to sport programme and to gain confidence in returning to cycling outdoors. However, if there is any doubt as to whether or not to return to sporting activities, we advise these women to consult with a doctor experienced in advising exercising females, e.g. a Sport and Exercise Medicine Consultant.

### **Breast feeding (lactation) and cycling**

The World Health Organisation advises women to breast feed for at least 6 months following the birth of their child(ren). There is no impact of intense exercise on the ability of women to breast feed or quantity and quality of breast milk [31]. Instead, high-volume aerobic exercise during breast feeding has been shown to result in slightly greater quality and quantity of milk [32]. There is now a consensus that exercise does not impact breast milk volume or composition or infant growth as long as the athlete has had appropriate food and fluid intake [33]. It is important to ensure that the exercising mother is consuming adequate amounts of calories (at least 500 extra calories per day, although this varies on the type and amount of exercise involved in) and nutrients for both the exercise and the lactation requirements. Moreover, it is important that nursing women ensure adequate hydration before exercise, with the colour of their urine being a good indicator of their hydration status, aiming for a light yellow colour rather than a dark yellow/brown colour which indicates dehydration.

It is highly recommended that women consider feeding their infant before exercise to avoid the discomfort of engorged breasts. The exercising breast-feeding mother should ensure she has an appropriate sized and fitted bra for their sporting requirements.

Like walking or light jogging and cycling are particularly recommended when returning to sport after childbirth, that is why the UCI encourages mothers' to breast-feed and to participate in cycling activities.

### **PRACTICAL GUIDANCE FOR CYCLING WHEN PREGNANT AND DURING THE POSTPARTUM PERIOD (INCLUDING LACTATION)**

Some practical advice to consider when cycling and pregnant:

- Undertake your cycling activities when pregnant up to the level that you did consistently prior to becoming pregnant.
- Do not cycle at an exercise intensity greater than 90% of your maximum heart rate when pregnant.
- Do not cycle for periods longer than 1 hour at any one time when pregnant. This duration may need to be reduced if the outside temperature is above 25°C and/or the relative humidity is above 45%.
- No competitive and/or organised recreational cycling events are permitted beyond the 1<sup>st</sup>



trimester of pregnancy.

- Consider adapting your bike to have a more upright posture when pregnant (and the postpartum period) to minimise the amount of pressure on the lower abdomen/pelvic area.
- Ensure your saddle feels comfortable and provides appropriate support to your perineal area when pregnant and the postpartum period.
- Plan your cycling route to reduce the risk of falls when pregnant.
- Keep well hydrated when cycling during the pregnancy and the postpartum period, drinking to thirst regularly throughout the ride. A good indicator of your hydration status is the colour of your urine – aiming for a clear/light yellow colour of urine.
- Following the birth, get back to exercise and physical activity as soon as you feel able, starting at low level and slowly building this up over a number of weeks. Most people will be able to get back to cycling activities within 6 weeks of giving birth but if there are any issues with this, then this can be discussed with a healthcare practitioner experienced in educating people about sport/physical activity participation, for example a consultant in sport and exercise medicine doctor.
- During pregnancy and the postpartum, wear a good fitting, supportive bra.
- Aim to consume an additional 500 calories per day, on top of what your usual daily calorie intake is, when lactating, although this does vary depending on the amount of cycling exercising being undertaken.
- Also consider breast feeding your child(ren) just prior to cycling to minimise the risk of painfully engorged breasts.

## **RACE OFFICIALS/ COACHES**

UCI accredited Race Officials and Coaches must ensure they are aware of this guidance. Race Officials and Coaches shall be able to continue within their role throughout their pregnancy, where they feel they are able to do so. The UCI recommends that where they decide to, they should discuss their role in cycling races with their Doctor prior to carrying this out throughout their pregnancy. The Doctor should be made aware of any risks associated with their role in order for them to provide informed advice. The UCI will also help to facilitate officials and coaches to continue lactating when undertaking their roles.

When carrying out their roles, Race Officials and Coaches should at all times seek to maintain the safety of participants and report any concerns to the UCI Integrity & Compliance Department. This information is of a general nature and is not to substitute medical advice from a medical practitioner.

## **UPDATING THE GUIDELINE**

The guideline will be updated on an annual basis and as new evidence emerges in this area of physical activity and exercise during pregnancy and the postpartum period.

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