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From the SelectedWorks of Mike Climstein

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Strong Mum-Healthy Bub?

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A new study looks at the potential benefits — or otherwise — for expectant mothers of participating in ‘realistic’ resistance exercise programs.

**Title:** Resistance Training During Pregnancy and Perinatal Outcomes  
**Author:** Dr’s White et al. (Dept of Health, Exercise and Rehabilitation, Winona State University, USA)  
**Source:** Journal of Physical Activity and Health (Volume 11 (6), pgs 1141-1148, 2014)

**Introduction:** It is only appropriate that this issue’s Research Review be on pregnancy and exercise as two of Mike’s higher degree PhD students and their wives are having babies (congratulations to Ben and Kim who just welcomed Billy to their family, and best wishes to James and Katrina who are expecting their first baby). OK, with the niceties out of the way let’s talk research!

Dr White and her colleagues have recently published a paper on resistance training during pregnancy and perinatal (time period from just before the birth to 7 days post birth) outcomes. We have known for quite some time that the benefits of regular (low-moderate intensity) exercise for the expectant mother include a reduction of backaches, bloating, swelling, improved sleep and weight control (which helps reduce the likelihood of gestational diabetes). Despite these benefits, Dr White reports that only two-thirds of pregnant women engage in any leisure-time physical activity. Of those who do exercise, walking is reported to be the most common (83 per cent), however resistance training is the third most popular form of exercise performed, but by only 10 per cent of the pregnant women who reported engaging in any physical activity.

It is not surprising that such a small percentage of pregnant women participate in resistance training given the potential risks. These include hyperthermia and a redistribution of blood flow away from the foetus. Dr White and her colleagues point out that a recently published randomised control study reported no association of light-moderate intensity exercises with gestational age at delivery or offspring body size, both of which are favourable findings. However, it should be noted that the participants in that study only used resistance bands or light barbells (i.e. <3kg). Dr White recognised that there was a need to investigate other, more realistic training regimes and hence conducted this comprehensive study.

**Method:** This study invited women aged 18 years of age or older who had given birth in the previous five years to participate in the study. Participants completed an online survey which investigated their birth outcomes (birth weight, gestational age at delivery, preterm labour, mode of delivery and infant height). The researchers also queried if the mother developed gestational diabetes, hypertensive disorders and birth weight. The survey also queried the type of exercise completed while pregnant (specific to first, second and third trimesters). Respondents were divided into three groups depending upon the mode(s) of exercise they completed: resistance training and aerobic exercise (RTAE), aerobic exercise only (AE) and no exercise (NE).

**Results:** A total of 284 women participated in the study. Women who completed resistance
training trained an average of 2.9 days per week for approximately 27 minutes per session throughout their gestation. These women participated in resistance training to primarily improve muscular endurance (lower resistance/higher reps). Specifically, the majority (72 per cent) reported training for muscular endurance during the first trimester, however this increased to 82 per cent by the third trimester. With regard to resistance training, approximately half (55 per cent) of the women used free weights, and 37 per cent used selectorised pin loaded machines for their resistance training.

Dr White and her co-investigators also found favourable results in pregnancy outcomes. With regard to maternal height, there was no significant difference between the exerciser groups (RTAE 165cm, AE 165cm) and the non-exercisers (163cm); however, body mass index was significantly (p<0.05) higher in the non-exercisers (29.0kg/m²) and AE (28.7 kg/m²) as compared to RTAE 25.2 kg/m². With regard to gestational diabetes, RTAE had the lowest incidence at 2.1 per cent compared with NE (5.7 per cent) and AE (12.1 per cent). Hypertensive disorders were also the lowest in the RTAE group (5.3 per cent) followed by NE (13.2 per cent) and AE (15.4 per cent). Lastly, the birth weight was similar between RTAE (3.49kg) and AE (3.51kg), while NE had the lowest birth weights (3.40kg).

The authors conclude that aerobic and resistance training exercise completed three days per week for 30 minutes at an intensity to maintain muscular endurance did not increase the risk of adverse pregnancy or birth outcomes.

Pros: This is a good article supporting the benefits of combined resistance training and aerobic exercise in women who are pregnant. There were a number of positive findings which support exercising while pregnant.

Personal trainers should take note that although this study showed benefits from exercise during pregnancy, it should not be forgotten that there are also many serious risks. The optimal health of the child and mother are the most important outcomes. As pregnancies can be very different (with many carrying higher risk of complication), it is therefore necessary to ensure that medical guidance and consultation is sought by women who plan to train during pregnancy.

As many personal trainers are aware, it is necessary to consult specific published guidelines (such as those published and freely available from Sports Medicine Australia and the American College of Sports Medicine) on exercise and pregnancy. Additionally, it is highly recommended that any women interested in participating in exercise (resistance training and/or aerobic) while they are pregnant see their GP and obstetrician for advice, approval and patient-specific recommendations.

The American Congress of Obstetricians and Gynecologists’ ‘Exercise During Pregnancy and Postpartum Period’ guidelines (2009) are available free online, and we would advise all women considering exercising while pregnant to read this expert advice.

This information contains both absolute/relative contraindications to exercise during pregnancy and warning signs to terminate exercise while pregnant. It is important to note that these guidelines were originally developed 13 years ago (2002), however they were reconfirmed by the association in 2009. The website also has a Frequently Asked Questions page on Exercise During Pregnancy, another important read.

A more recent (2014) factsheet by Exercise is Medicine Australia is available free online.

Cons: The title of the research paper is somewhat misleading as the ‘resistance trained’ group also completed aerobic exercise. It would have been beneficial to have a resistance training-only group for better comparison. It would have been useful if the researchers had reported the participants exercise intensity, particularly as the authors comment on a previous study utilising low intensity (<3kg).

Also, the finding that AE had a higher incidence of gestational diabetes as compared to NE is quite surprising. The authors attribute this to the possibility that sedentary women who were found to have gestational diabetes were advised to undertake walking, and hence the higher incidence. However, this illustrates a methodological problem, as readers we ‘assume’ the exercising groups (RTAE and AE) were exercising throughout their entire gestational period. Therefore, the researchers should reanalyse their data in order to only include participants who were exercising (or not exercising) throughout their entire pregnancy in the analyses.

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The 30-second article

• Less than 10 per cent of pregnant women do any resistance training
• The researchers investigated whether there was a link between exercise and birth weight, gestational duration, preterm labour, mode of delivery, gestational diabetes, hypertensive disorders and height and weight of the newborn
• Positive correlations were found between certain physical activity and health markers in pregnant women
• It is advisable for fitness professionals who train pregnant women to consult a range of specific published guidelines.