

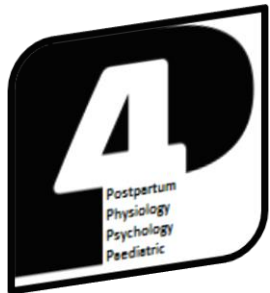


# Maternal body composition, energy balance and micronutrient intake 6 months postpartum in women with previous normotensive versus hypertensive pregnancy

Never Stand Still

Medicine

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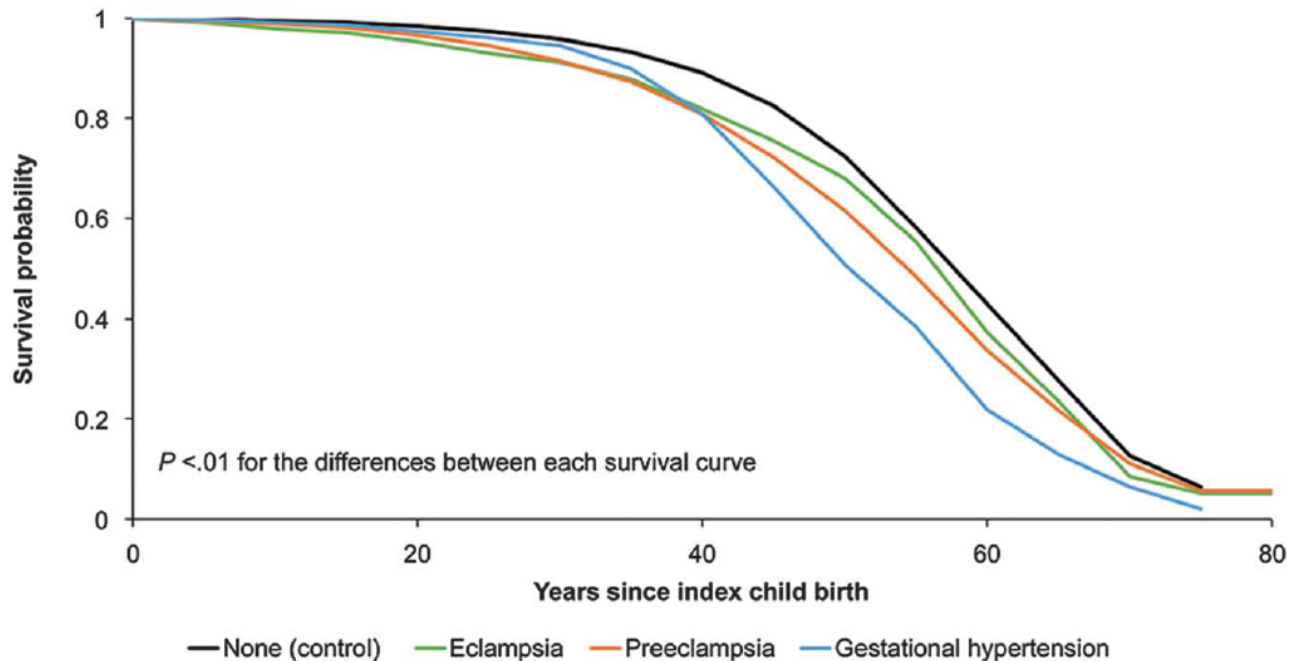
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# Background

- Women with previous hypertensive pregnancy (HP) compared to normotensive pregnancy (NP) are at:
  - 3x risk of developing chronic hypertension
  - 2x risk of having a myocardial infarction or stroke<sup>1</sup>



<sup>1</sup>Brown MC, et al. Cardiovascular disease risk in women with pre-eclampsia: systematic review and meta-analysis. European Journal of Epidemiology. 2013;28(1):1-19.

<sup>2</sup>Theilan LH, et al. All-Cause and Cause-Specific Mortality After Hypertensive Disease of Pregnancy. Obstetrics & Gynecology. 2016;128(2):238-44

# Objectives

To determine the differences in:

1. Body composition
2. Energy balance
3. Micronutrient intake

between women with previous NP compared to those with HP at **6 months postpartum**



# The P4 Study at St George Hospital: Postpartum Women



## *Physiology*

- Blood Pressure
- Cardiac Function
- **Metabolic studies**
- Risk factors



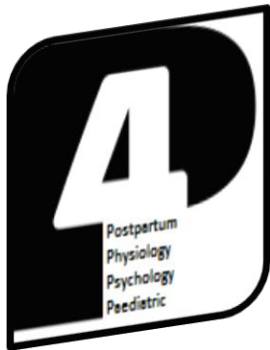
## *Psychology*

- Depression
- Anxiety
- PTSD



## *Paediatric*

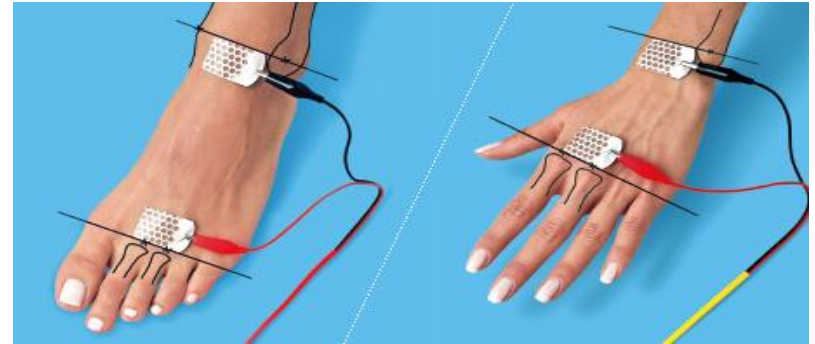
- Physical development
- Behavioural development



- Follow up study at 6 months, 2 years and 5 years post partum
- Normotensive vs. Hypertensive pregnancy

# Methods

- Body composition (BC) was measured using multi-frequency bioelectrical impedance analysis
- Energy expenditure (EE) measured using SenseWear Armband
- Energy intake (EI) + micronutrient intake: 3-day food diary entered into FoodWorks program



# Results – Body Composition

	Normotensive (n=226)	Hypertensive (n=85)	P-Value
<i>Pre-pregnancy BMI (kg/m<sup>2</sup>)</i>	24	26	<b>0.001</b>
<i>Postpartum BMI (kg/m<sup>2</sup>)</i>	25	28	<b>&lt;0.001</b>
<i>Difference in BMI (kg/m<sup>2</sup>)</i>	1.1	1.9	<b>0.008</b>
<i>Fat mass (%)</i>	36	39	<b>0.005</b>
<i>Lean body mass (%)</i>	52	48	<b>0.02</b>

- **↑ Fat mass %**
- **↓ Lean body mass %**
- **↓ Weight loss**
- Consistent with *Suntio et al's* study of HP vs. NP at 3 months postpartum

# Results – Breastfeeding

- 59% HP vs. 79% NP were breastfeeding

	Non-breastfeeding (n=82)	Breastfeeding (n=229)	P-Value
<i>Pre-pregnancy BMI (kg/m<sup>2</sup>)</i>	27	24	<b>&lt;0.001</b>
<i>Postpartum BMI (kg/m<sup>2</sup>)</i>	29	25	<b>&lt;0.001</b>
<i>Difference in BMI (kg/m<sup>2</sup>)</i>	2	1	<b>&lt;0.001</b>
<i>Fat mass%</i>	40	35	<b>&lt;0.001</b>
<i>Lean body mass%</i>	46	52	<b>&lt;0.001</b>

- **↑ Lean body mass %**
- **↓ Fat mass %**
- **↑ Weight loss**
- Consistent with *Antonakou et al.*, *McClure et al.* and *Hatsu et al.*

# Results – Energy Balance (sub-group)

	Normotensive (n=59)	Hypertensive (n=13)	P-Value
24-hr EE (kJ)	10259	11107	0.12
Basal metabolic rate per kg lean body mass (kJ/kg)	240	258	0.50
24-hr EI (kJ)	9552	7833	<b>0.02</b>
EI per kg lean body mass(kJ/kg)	298	224	<b>0.002</b>

- EI (224kJ/kg) < EE (258kJ/kg) = negative energy balance
- ? Less weight loss and more fat mass
- Pregnancy is an **altered metabolic state** with increased fat storage efficiency (*Abeysekera et al.*) – does this **persist** in the postpartum period of women with previous HP?



# Results – Micronutrient Intake (sub-group)

Micronutrient	Percentage Difference (%)	Micronutrient	Percentage Difference (%)
<i>Vitamin A equivalents</i>	<b>-44*</b>	<i>Magnesium</i>	<b>-37**</b>
<i>Vitamin C</i>	-41	<i>Calcium</i>	<b>-32*</b>
<i>Vitamin E</i>	<b>-40*</b>	<i>Phosphorus</i>	<b>-27*</b>
<i>Vitamin B6</i>	<b>-69*</b>	<i>Iron</i>	<b>-27*</b>
<i>Vitamin B12</i>	<b>-54*</b>	<i>Zinc</i>	-17
<i>Folate</i>	<b>-30*</b>	<i>Selenium</i>	-18
<i>Sodium</i>	<b>-30*</b>	<i>Iodine</i>	<b>-27*</b>
<i>Potassium</i>	<b>-28*</b>		

\*p<0.05; \*\*p<0.01

**Bold** = significant difference; **Red** = below NHMRC recommended daily intake

- Only 18% reduced total EI
- Poor quality diet

# Conclusion

- These results provide basis for research on early intervention in the postpartum period regarding:
  1. Dietary changes or supplementation of micronutrients associated with cardiovascular health
  2. Weight loss programs focusing on reducing fat mass
  3. Education + support of breastfeeding to assist weight loss
- Future direction: continue recruitment at 6 months postpartum and follow-up at 2 and 5 years postpartum



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## Affiliated institutions

St George Hospital, Kogarah, NSW: Department of Women and Children's Health,  
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