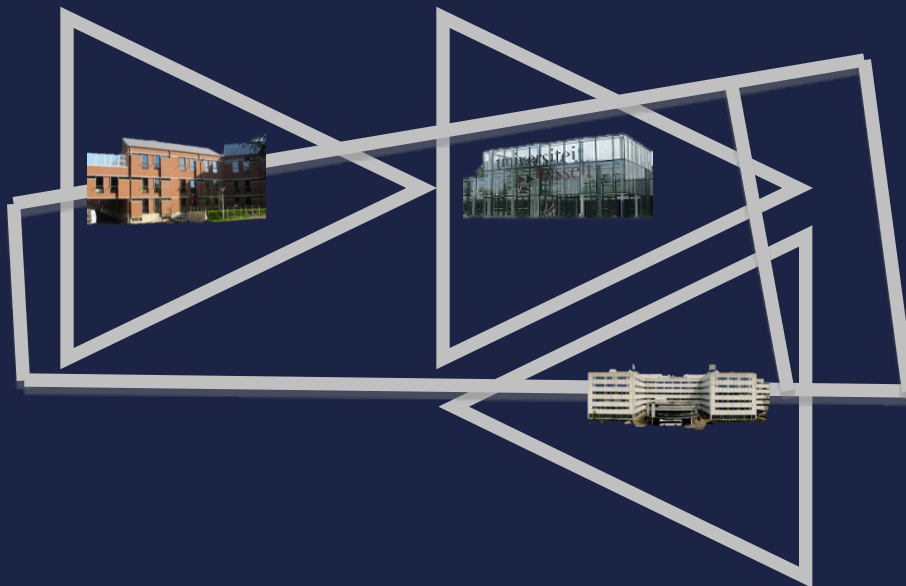


Mobile health technologies in gestational hypertensive disease



W. Gyselaers

5 – 8% gestational hypertensive disease (GHG)

- Ziekenhuis Oost-Limburg: 1.918 → 140 (8.21%) GHD
- Vlaanderen + UZ Brussel: 65.729 → 3.006 (4.6%) GHD

SPE 2014

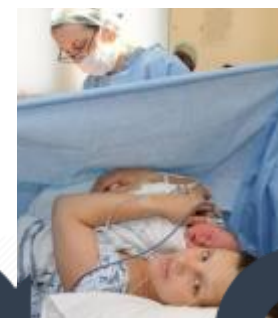
Sinds het begin van de registratie noteerden we 93 maternale sterfgevallen ($\pm 1 / 20\ 000$ bevallingen).

De meeste sterfgevallen stonden in onmiddellijk verband met de partus en waren vooral vruchtwater-embolie (N=13), longembolie (N=12), pre-eclampsie / HELPP/AFLP (N=10), bloeding (N=6), sepsis (N=8), uterusruptuur (N=6), anesthesie problemen en ARDS (N=7).

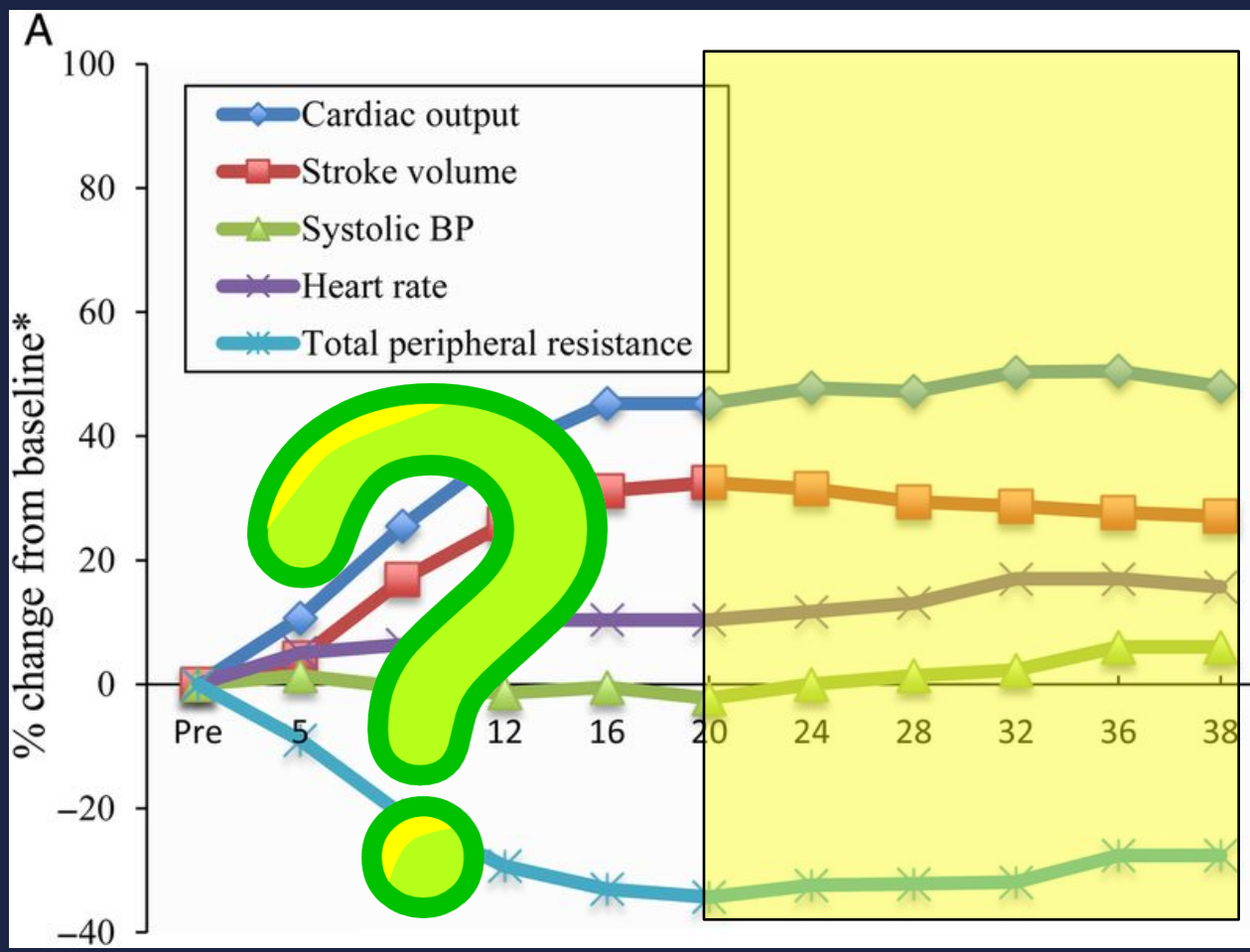
Open Journal of Preventive Medicine, 4, 91-99.

Table 4. Predictors of LBW by multivariable conditional logistic regression analysis.

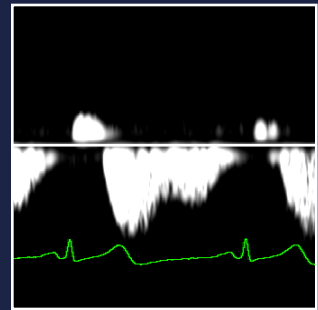
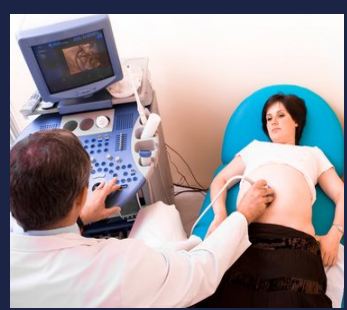
Variable	B	Adj. OR (95% CI) ^a	Wald (df)	p value
Gestation Age	0.881	2.41 (1.79 - 3.26)	33.113 (1)	<0.001 [*]
Maternal Age	1.063	2.89 (1.86 - 4.51)	21.957 (1)	<0.001 [*]
Hypertension	1.509	4.52 (1.06 - 19.22)	4.179 (1)	0.041 [*]
History of LBW	1.318	3.74 (1.03 - 13.58)	4.010 (1)	0.045 [*]



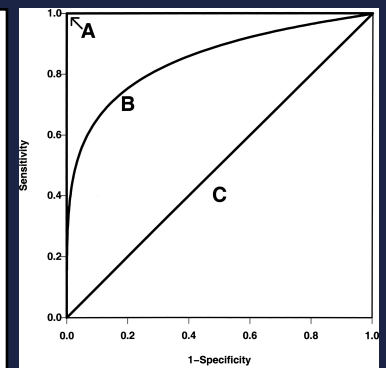
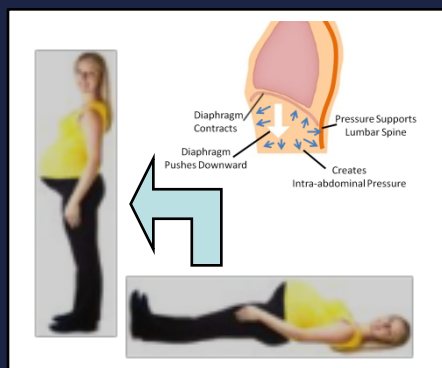
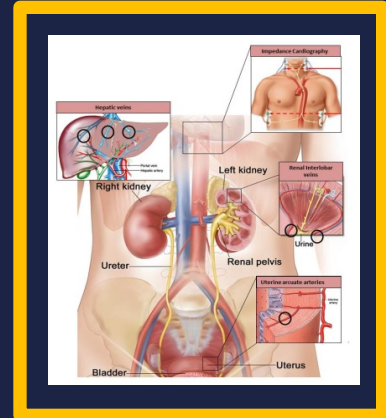
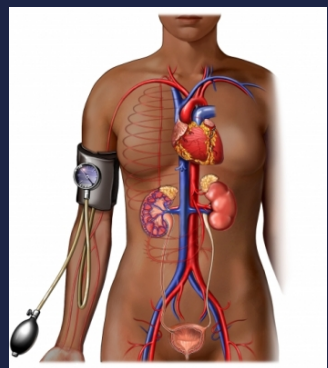
Pathophysiology



Non-invasive assessments

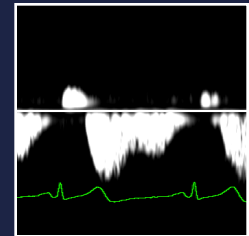
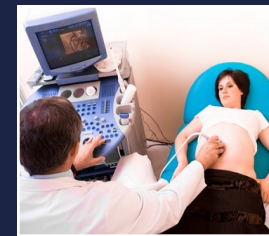


2006 2008 2010 2012 2014

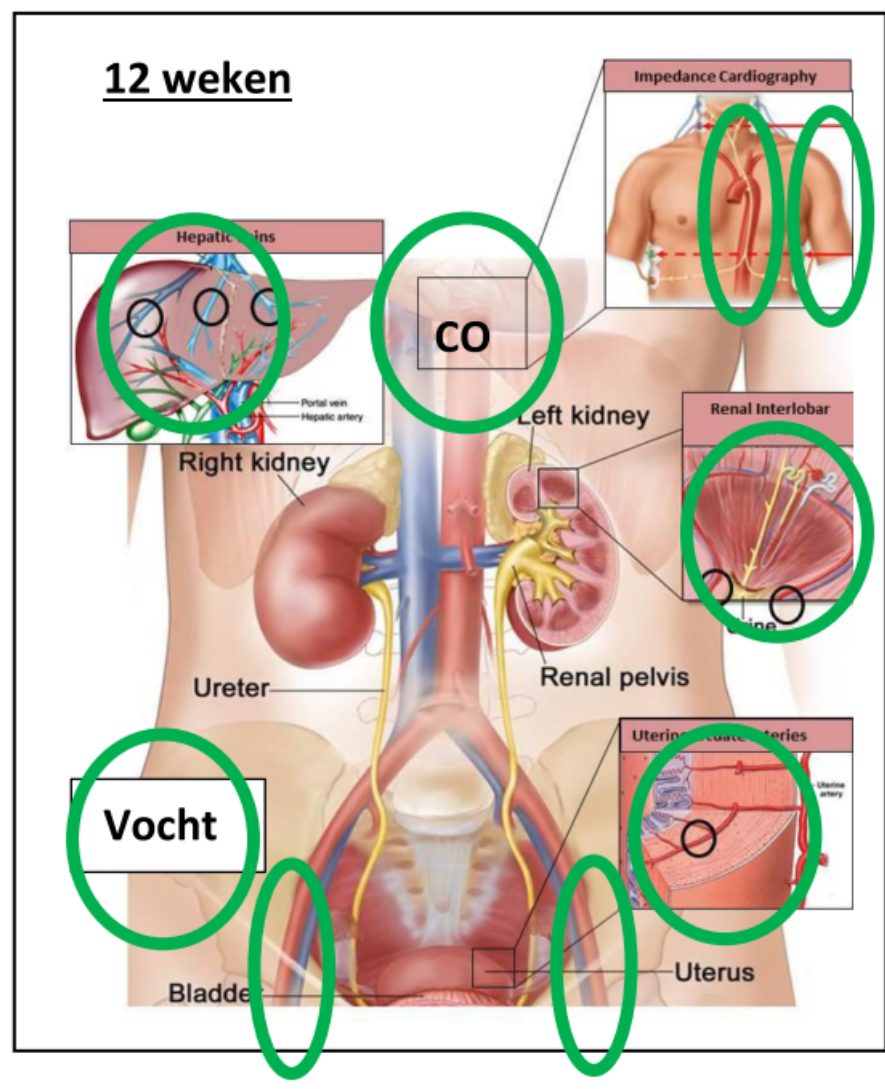


Validation technologies ICC $\geq 0,8$

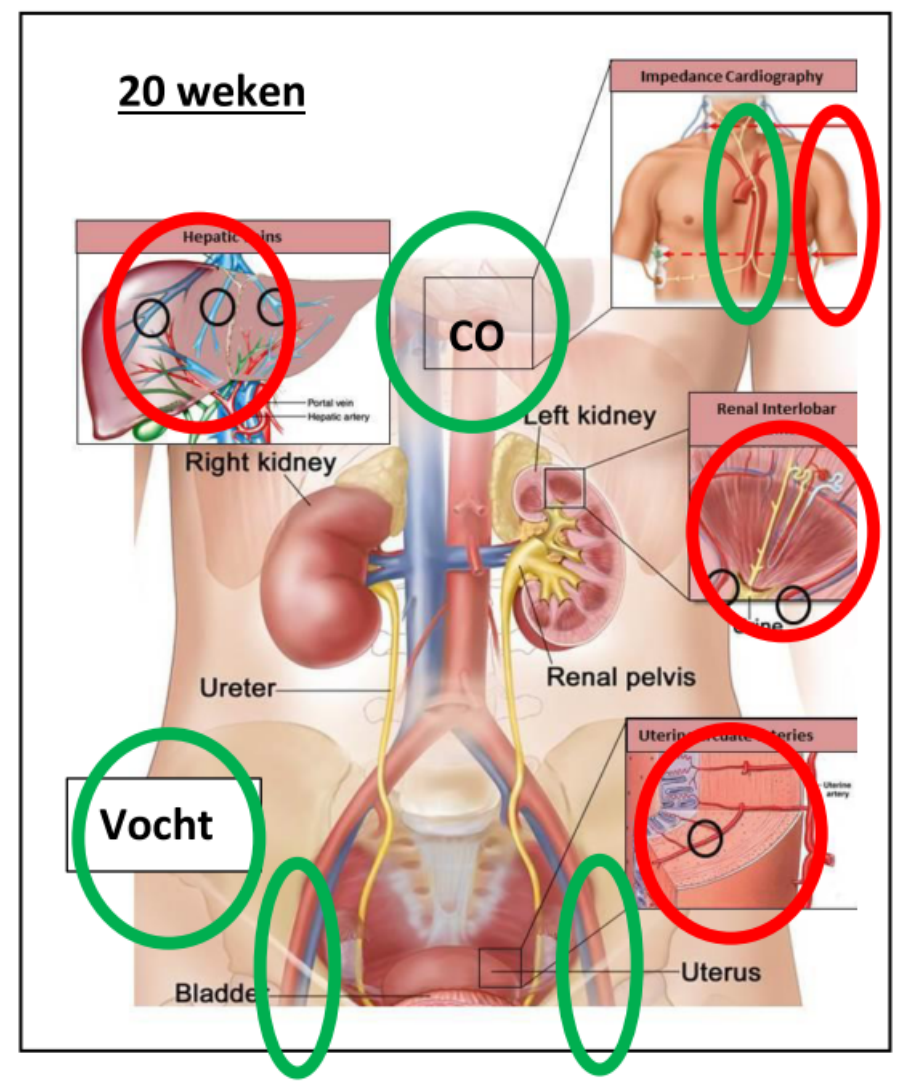
- Venous Doppler-ECG
- Impedance cardiography
- Bio-impedance body fluid assessment
- Remote monitoring



12 weken



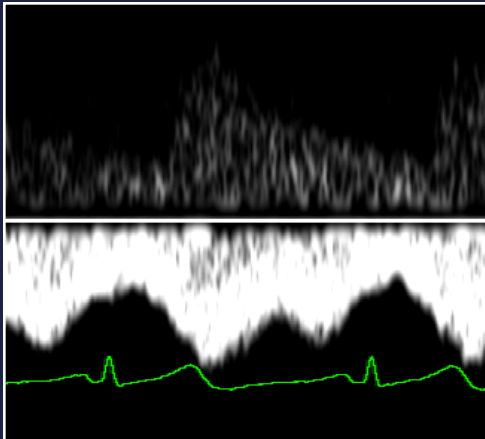
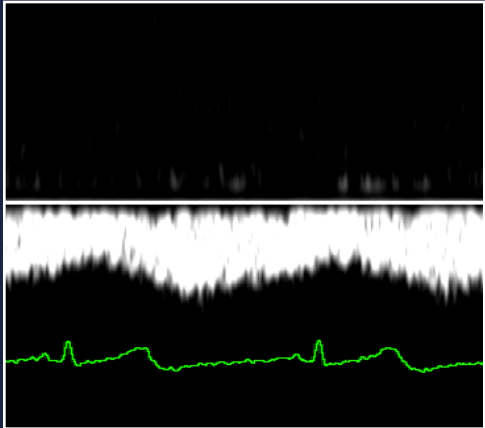
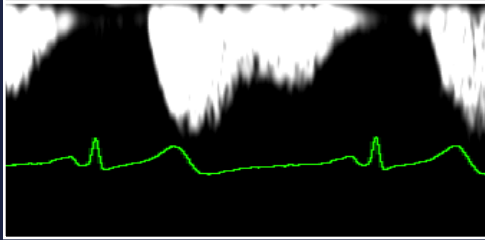
20 weken



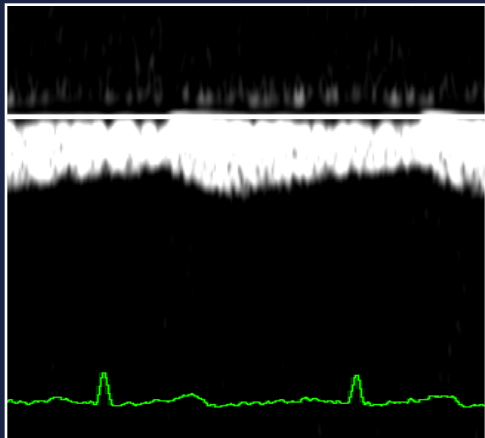
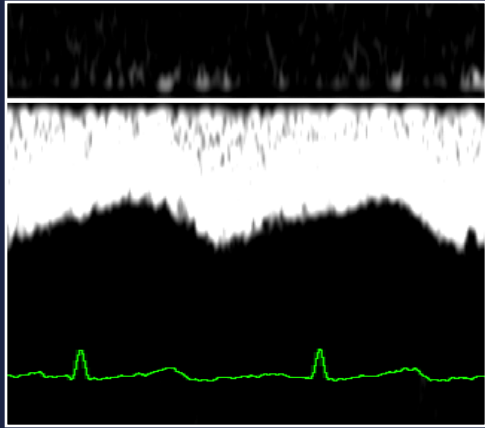
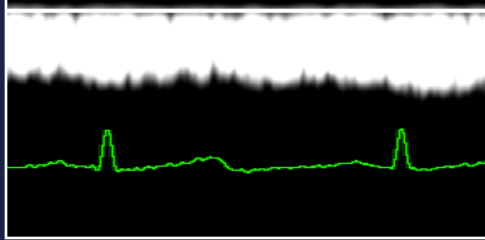
(Patho)- Physiologic observations

- Normal ↔ Pathological pregnancies
- Gestational hypertensive diseases show:
 - Different orthostatic stress responses
 - Different impact on
 - Kidneys
 - Liver
 - Fetal growth
 - **Different cardiovascular profiles**

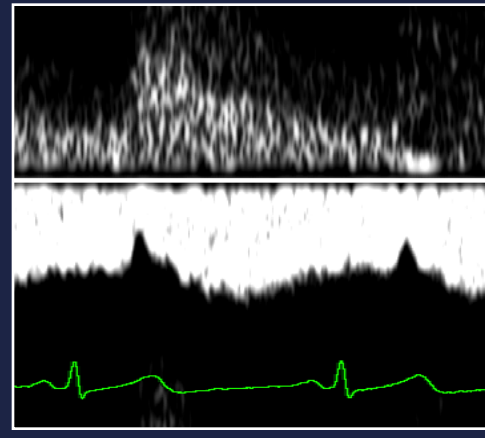
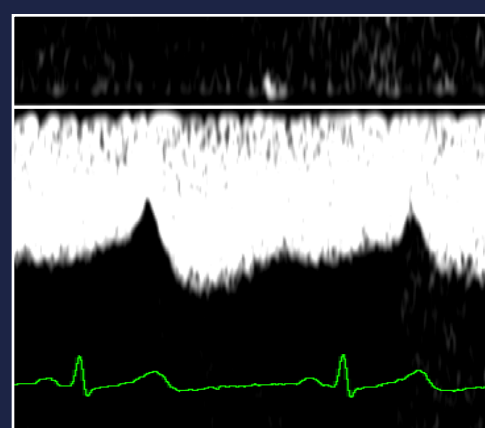
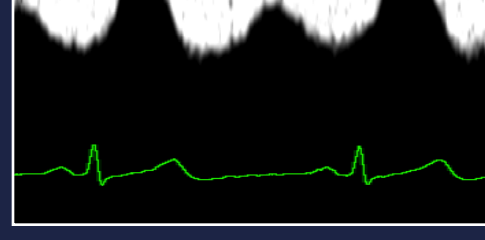
Not Pregn



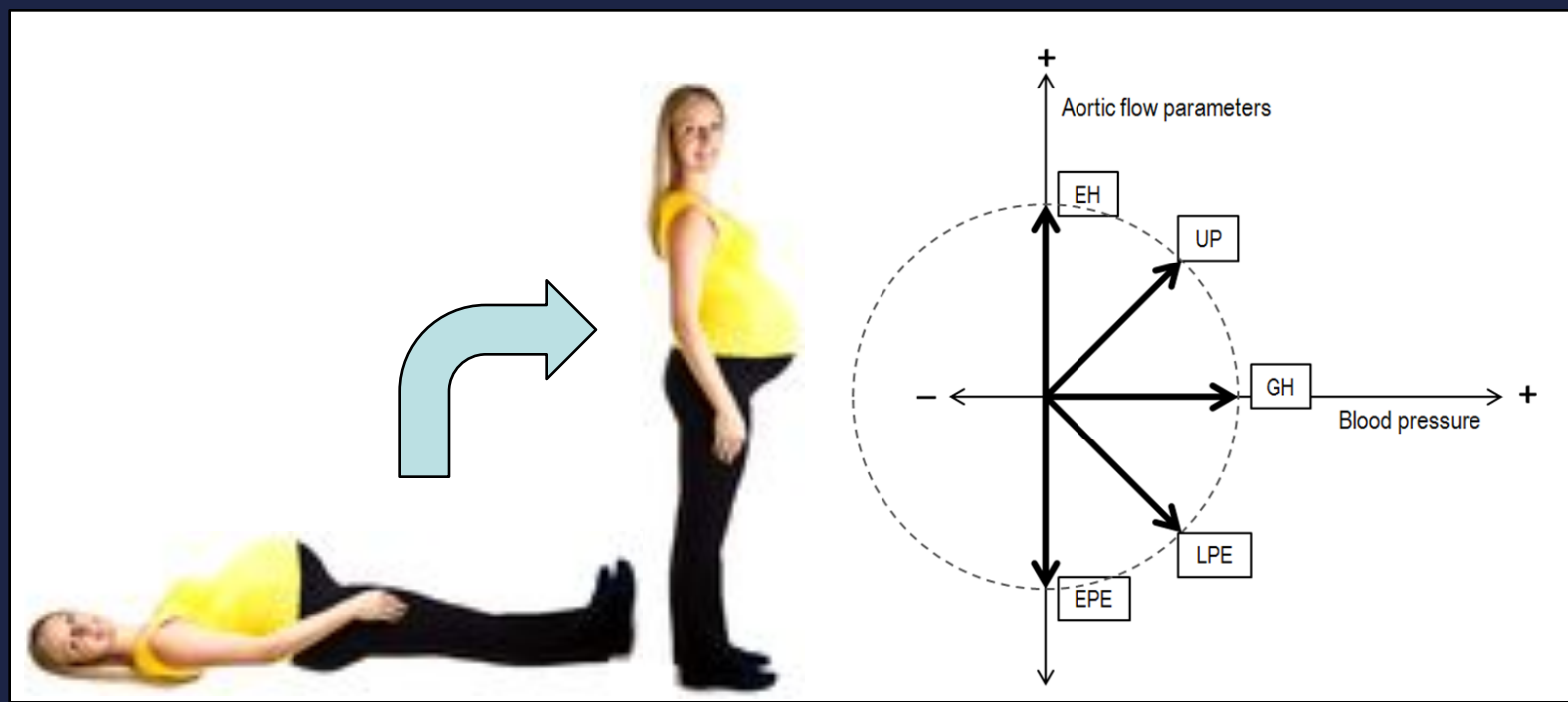
3° Tr



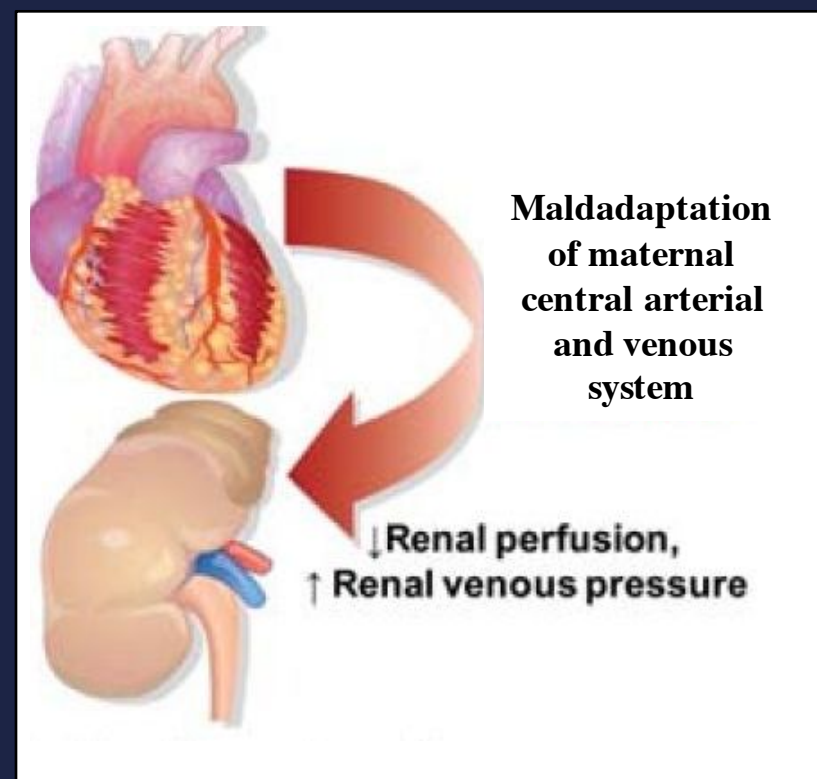
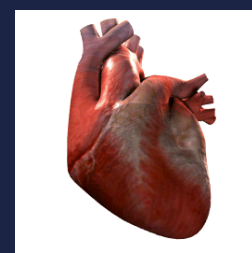
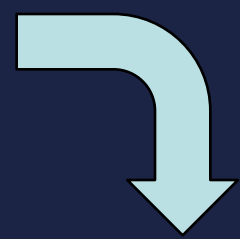
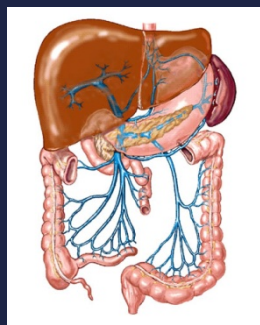
PET



Different orthostatic stress response

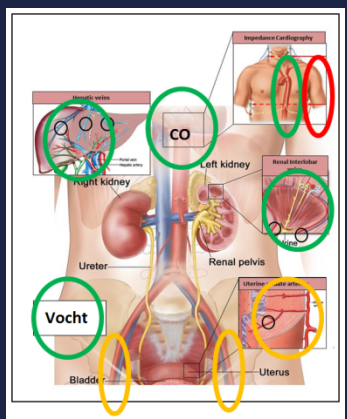
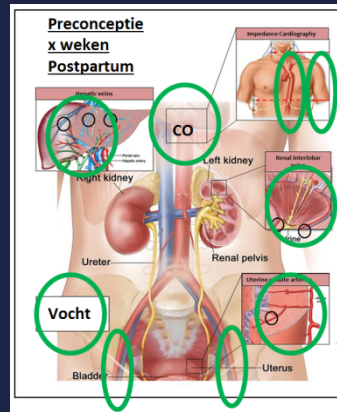


Different organ (dys-)function

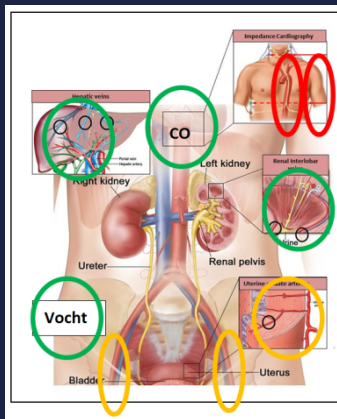


Indications

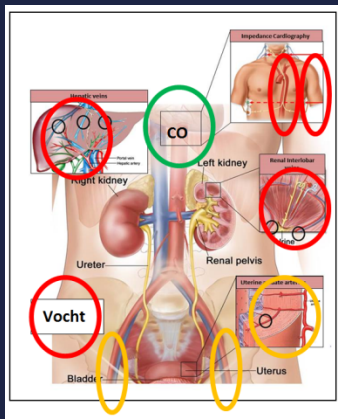
- Hypertension
- Obstetric history
- Family health/disease
- Low birth weight



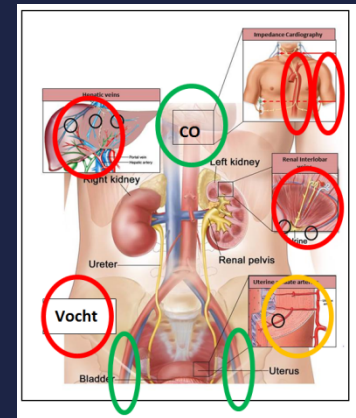
Essential hypertension



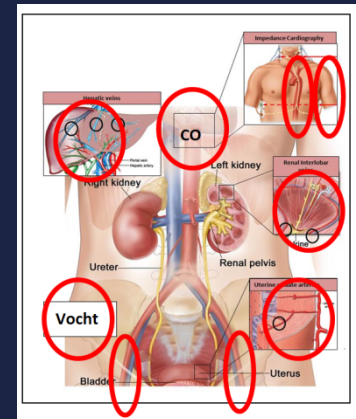
Gestational hypertension



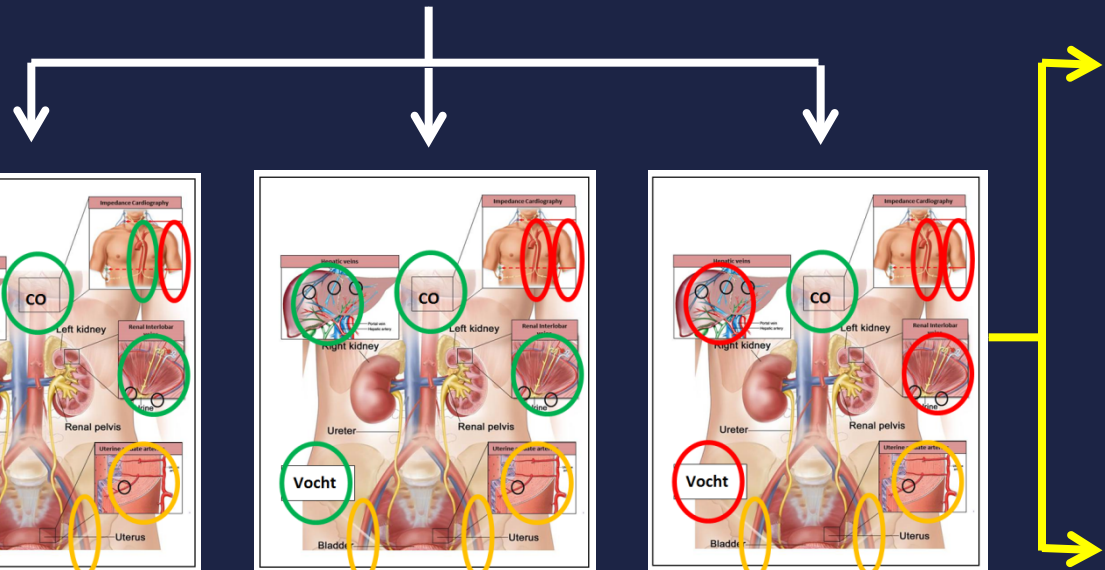
Pre-eclampsia



Maternal (mild) PE



Vascular (severe) PE



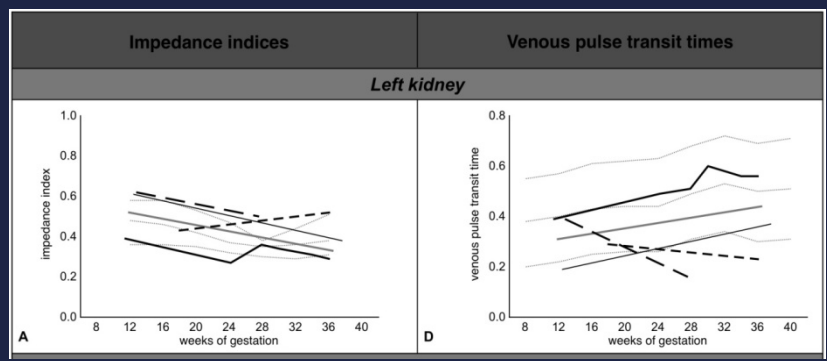
Clinical application

- Screening
- Ambulatory preeclampsia clinic
- Remote monitoring

First trimester CV profile

Low values at 12 w in GH/PE

J Mat Fet Neonat Med 2014



J Mat Fet Neonat Med 2014

<u>Blood pressures</u>					
		EH	GH	LPE	EPE
	SBP	↑	↑	↑	↑
	DBP	↑	↑	↑	↑
	MAP	↑	↑	↑	↑
<u>Arterial hemodynamics</u>					
		EH	GH	LPE	EPE
Aorta	VI		↓	↓	↓
	ACI		↓	↓	↓
Ut Arc Art	Rt APTT			↓	↓
	Lt APTT			↓	↓
	R RI				↑
	L RI				↑
<u>Venous hemodynamics</u>					
		EH	GH	LPE	EPE
Rt kidney	Rt RIVI			↑	↑
	Rt VPTT				↓
Lt kidney	Lt RIVI			↑	↑
	Lt VPTT				↓
Liver	Hep VI			↑	↑
	Hep VPTT				↓

Ultrasound Obstet Gynecol 2015

Screening for PE/GH at 12w

External validity of first-trimester pre-eclampsia screening

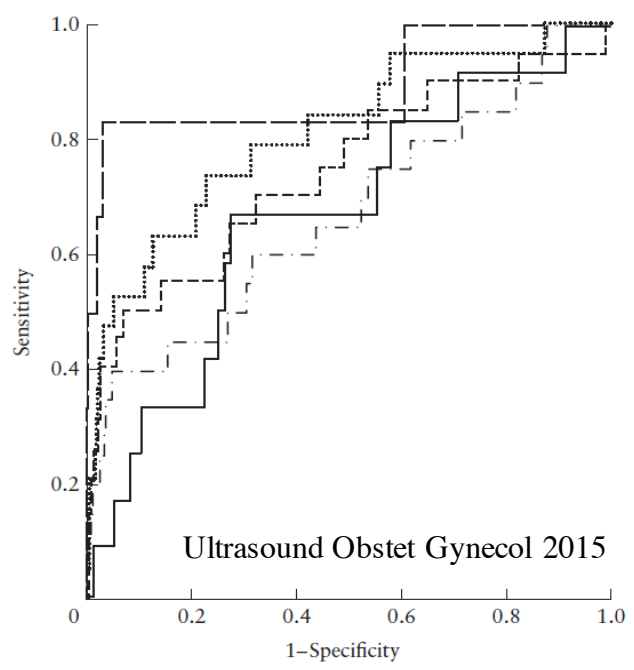
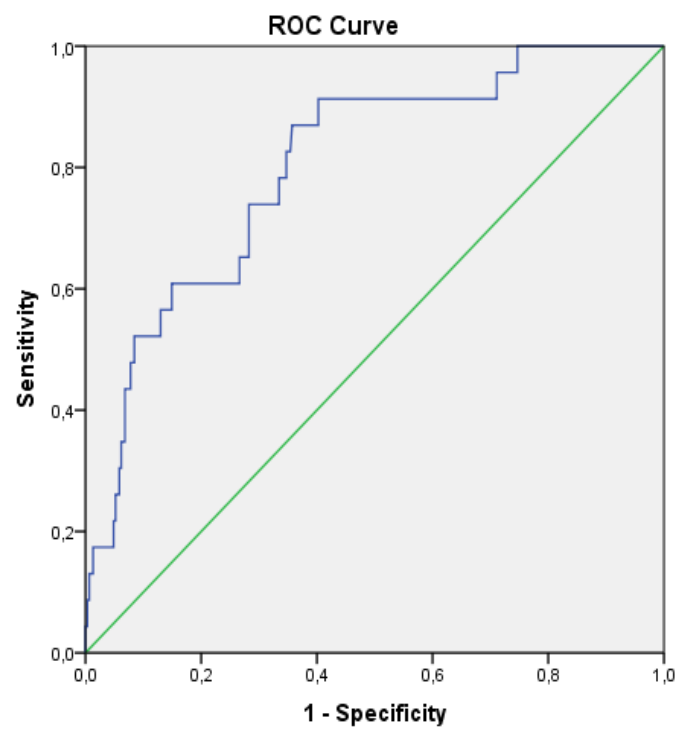


Figure 1 Receiver–operating characteristics curves of the probability scores derived from five predictive algorithms for pre-eclampsia requiring delivery prior to 34 weeks for patients not receiving aspirin. —, Odibo *et al.*¹²; , Poon *et al.*⁸; ----, Parra-Cordero *et al.*⁷; - · - · - , Caradeux *et al.*¹⁵; ———, Scazzocchio *et al.*¹⁰.

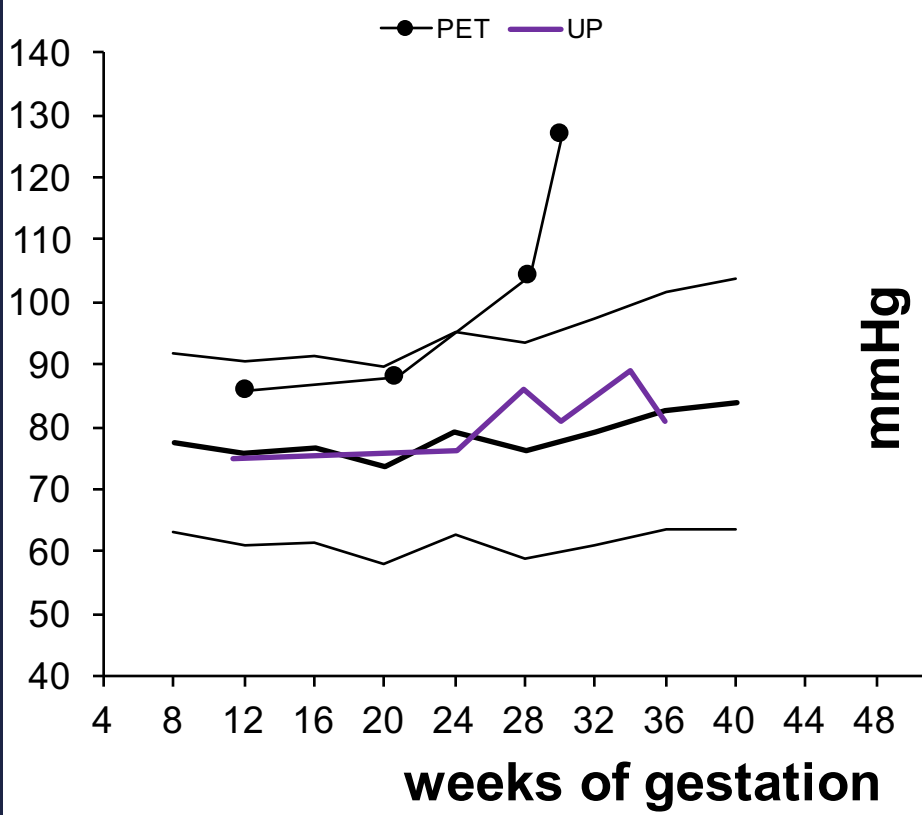


Diagonal segments are produced by ties.

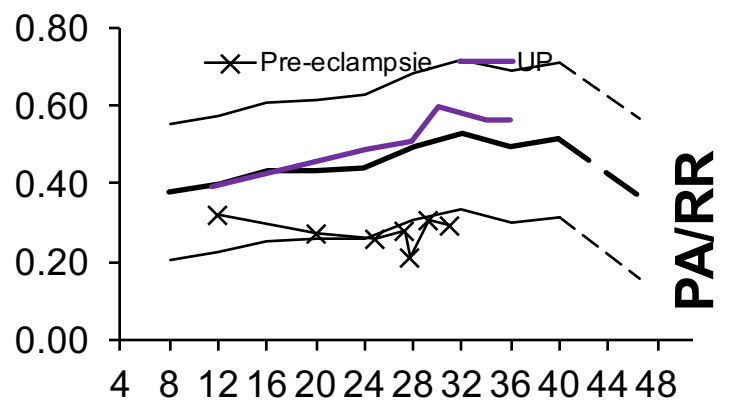
$n \sim 350 \rightarrow 1000$

Ambulatory PE clinic

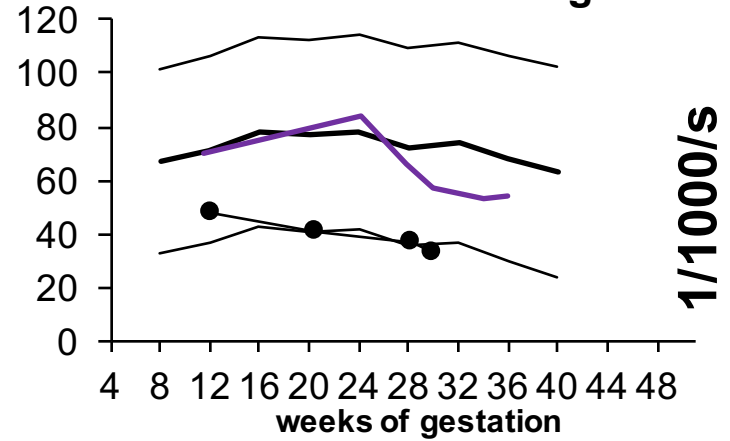
DBP standing



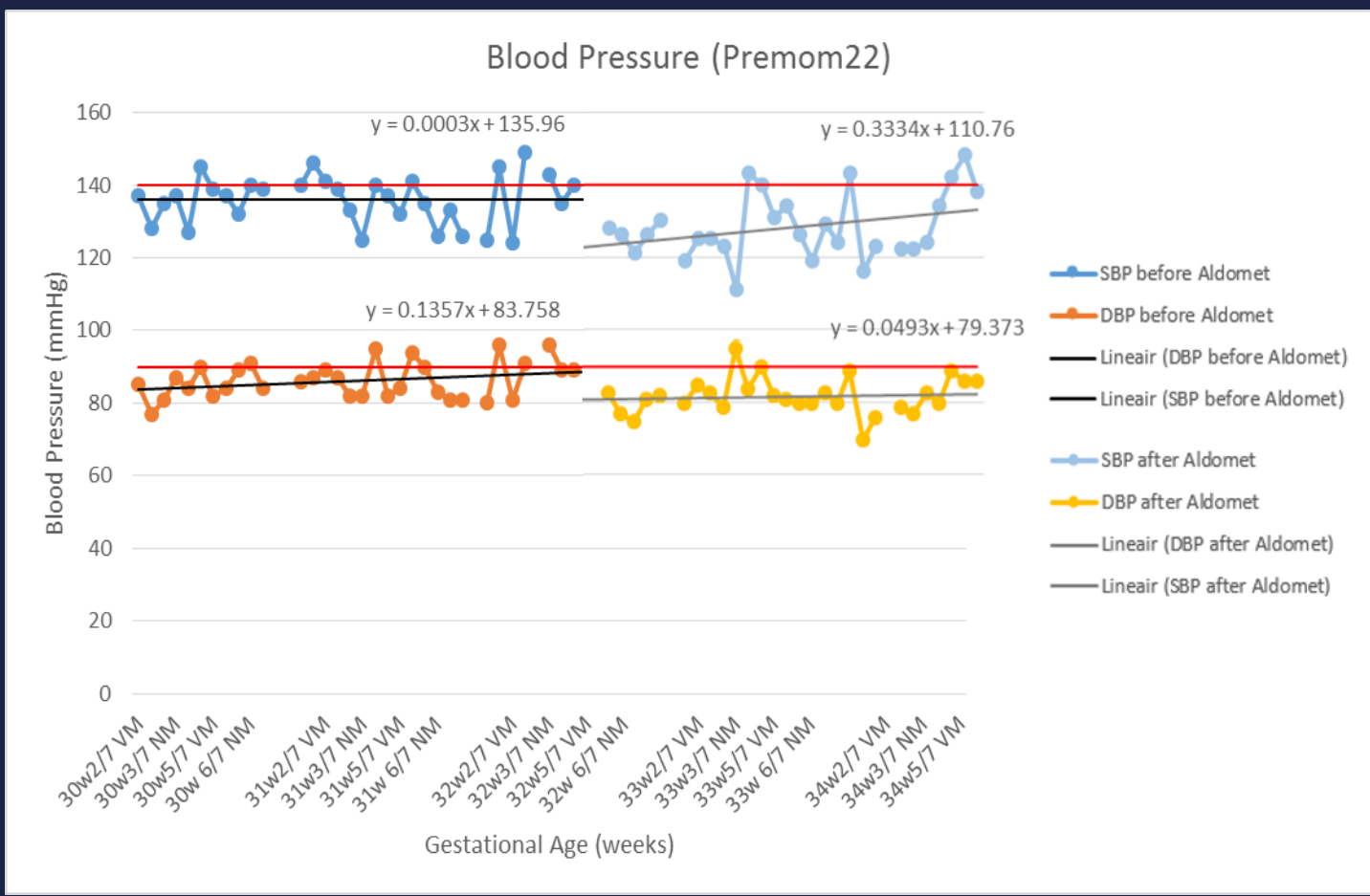
Left kidney



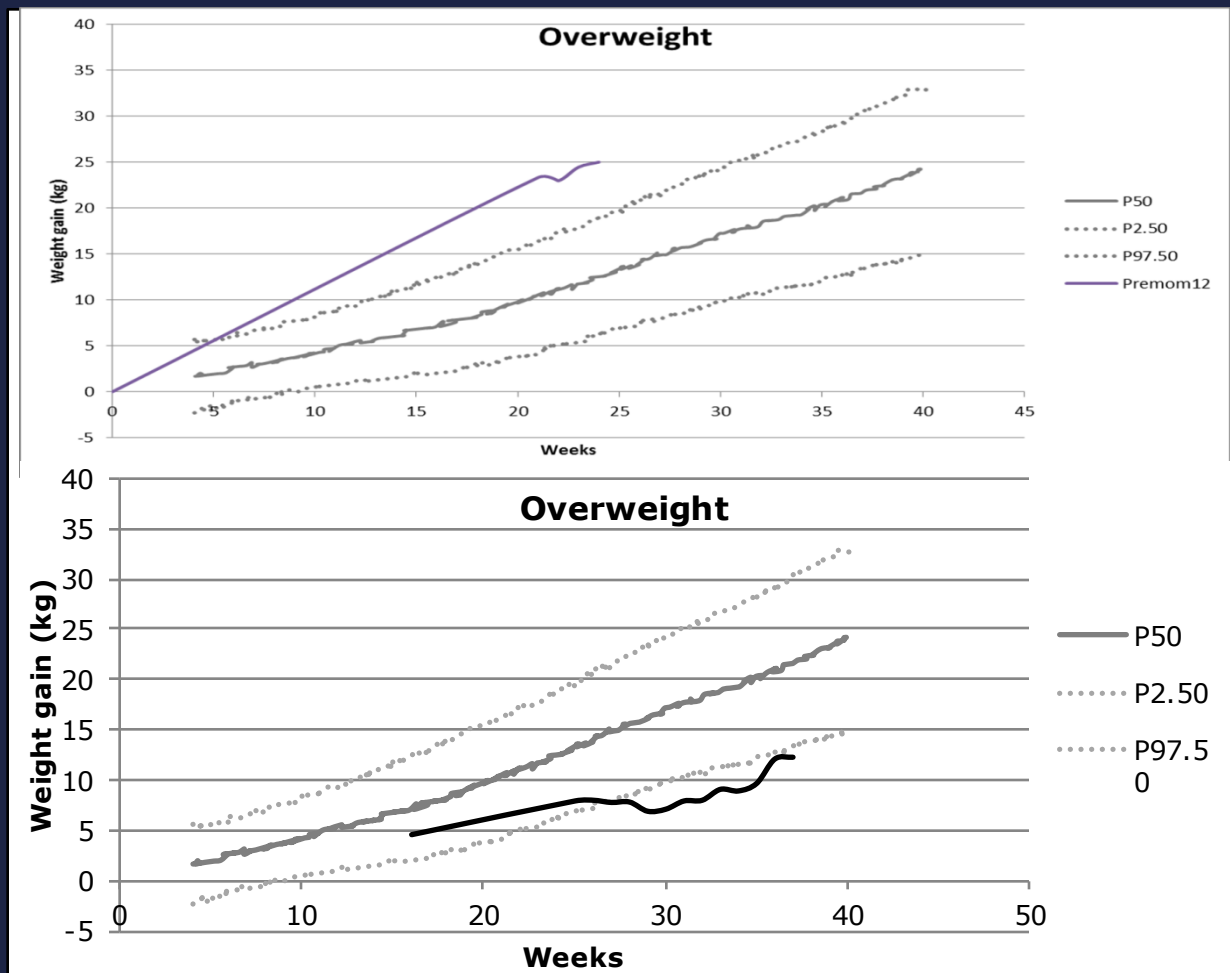
VI standing



Remote monitoring AHT

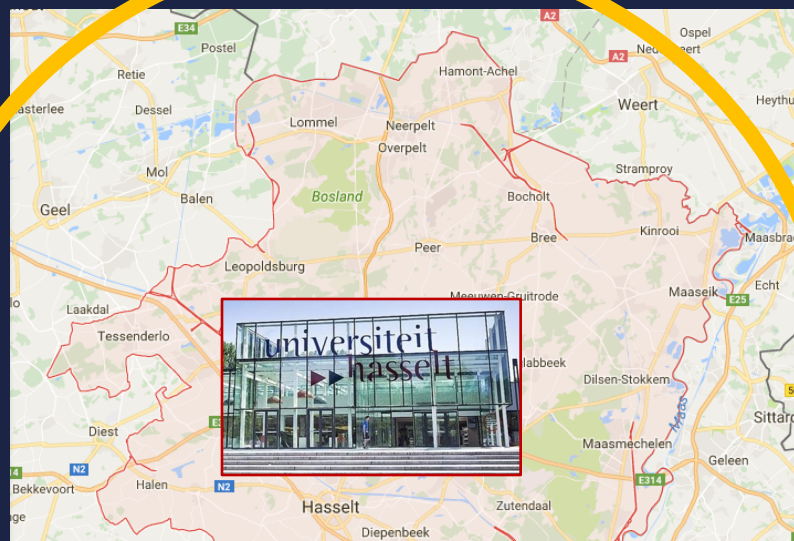


Remote weight obesity



Remote activity

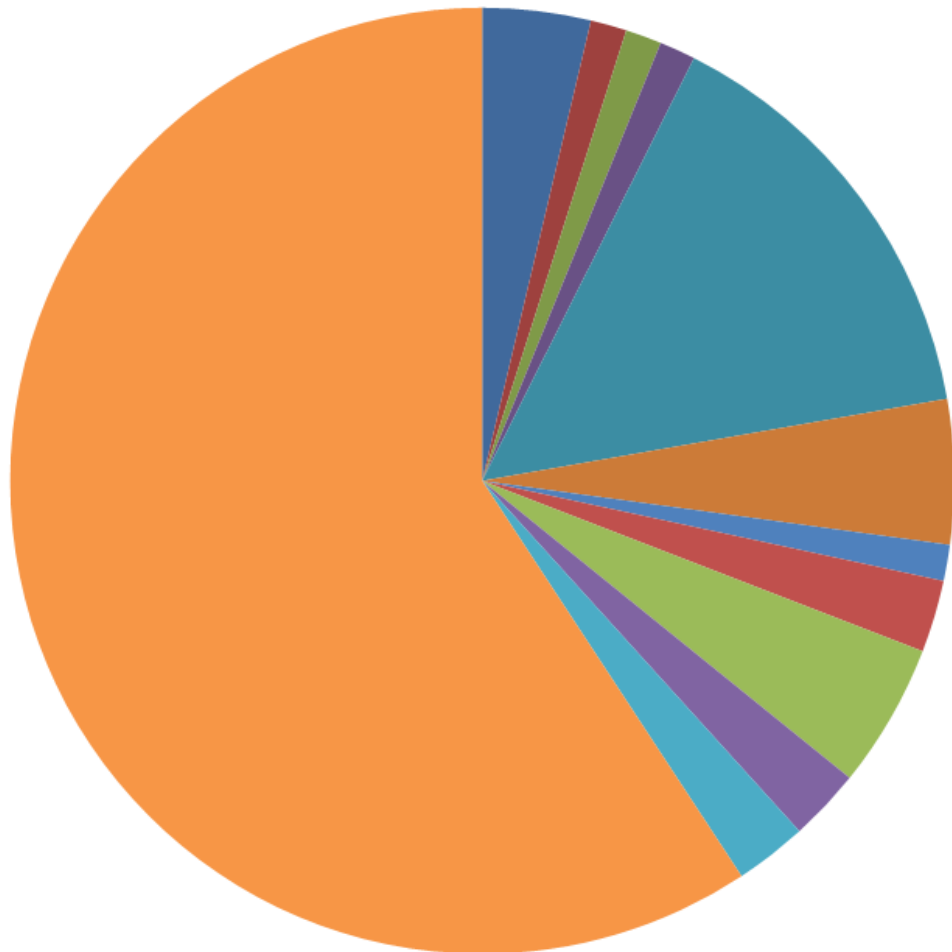




<http://www.zwangerschaps-vergiftiging.org>

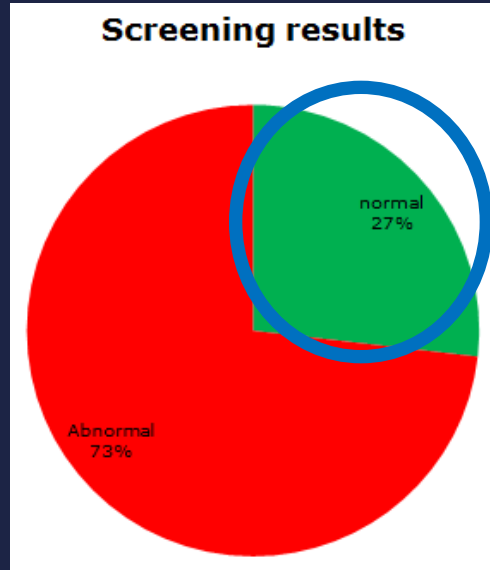


LimPrOn referrals 6 months



- Bree
- Diest
- Gent
- Herentals
- Heusden
- Hasselt
- Maastricht
- Mol
- Overpelt
- St-Truiden
- Tongeren
- Genk

n = 82



Pilootstudie ZOL 2015

<i>Variable</i>	<i>Remote monitoring group (n = 44)</i>	<i>Conventional Care (n = 98)</i>	<i>Statistical significance (2 – tailed)</i>
GA delivery (week)	37.16 (± 3.18)	37.16 (± 3.18)	<i>P</i> = 0.71
Start birth process (%):			
- Spontaneous	56.81% (n = 25)	31.63% (n = 31)	<i>P</i> < 0.001
- Induction	27.27% (n = 12)	48.98% (n = 48)	<i>P</i> = 0.02
- Primary cesarean section	15.91% (n = 7)	19.39% (n = 19)	<i>P</i> = 0.62
Mode of delivery (%):			
- Vaginal	65.91% (n = 29)	59.18% (n = 58)	<i>P</i> = 0.44
- Instrumental	9.09% (n = 4)	8.16% (n = 8)	<i>P</i> = 0.85
- Primary cesarean section	15.91% (n = 7)	19.39% (n = 19)	<i>P</i> = 0.62
- Secondary cesareans section	9.09% (n = 4)	13.27% (n = 13)	<i>P</i> = 0.48
Birthweight (g)	3044.68 (± 698.84)	2941.35 (± 868.37)	<i>P</i> = 0.48
Birth percent (%)	51.34 (± 28.58)	51.34 (± 34.58)	<i>P</i> = 0.66
Length (cm)	49.33 (± 2.85)	48.29 (± 3.51)	<i>P</i> = 0.13
Apgar 1'	8.09 (± 1.25)	7.98 (± 1.41)	<i>P</i> = 0.68
Apgar 5'	9.13 (± 0.80)	9.12 (± 0.86)	<i>P</i> = 0.93
Admission NIC (%)	11.36% (n = 5)	31.63% (n = 31)	<i>P</i> = 0.02
GA = gestational age, NIC = Neonatal Intensive Care			
Data are mean (± SD) or percentage (number).			



4.1.1. Aantal afspraken - update

KCE 2004	Aanbeveling	Graad van aanbeveling	Niveau van bewijskracht
	<ul style="list-style-type: none"> Stel na de diagnose van de zwangerschap aan zwangere vrouwen zonder risicofactoren een programma voor van tien afspraken* als ze voor het eerst zwanger zijn en van zeven afspraken* bij vrouwen die reeds eerder bevallen zijn. 	Sterk	A**

* Deze afspraken kunnen bij een gynaecoloog en/of vroedvrouw en/of huisarts gepland worden.
 ** Niveau van bewijskracht van de Australische richtlijn 2014: A = Eén of meer niveau I-studie(s) met een laag risico op bias of meerdere niveau II-studies met een laag risico op bias (zie tabel 3 in hoofdstuk 5.3.)



Clin Sci (Lond). 2016 Feb;130(4):239-46. doi: 10.1042/CS20150567.
Long-term renal and cardiovascular risk after preeclampsia: towards screening and prevention.
Paauw ND¹, Luijken K², Franx A², Verhaar MC³, Lely AT².



*Lots of greetings
from the
Hasselt Team*

