MONITORAGGIO EMODINAMICO NON INVASIVO

European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

ESRA Cè

XXIX CONGRESSO NAZIONALE

ESRA Italian Chapter

CESENA, Cesena fiere

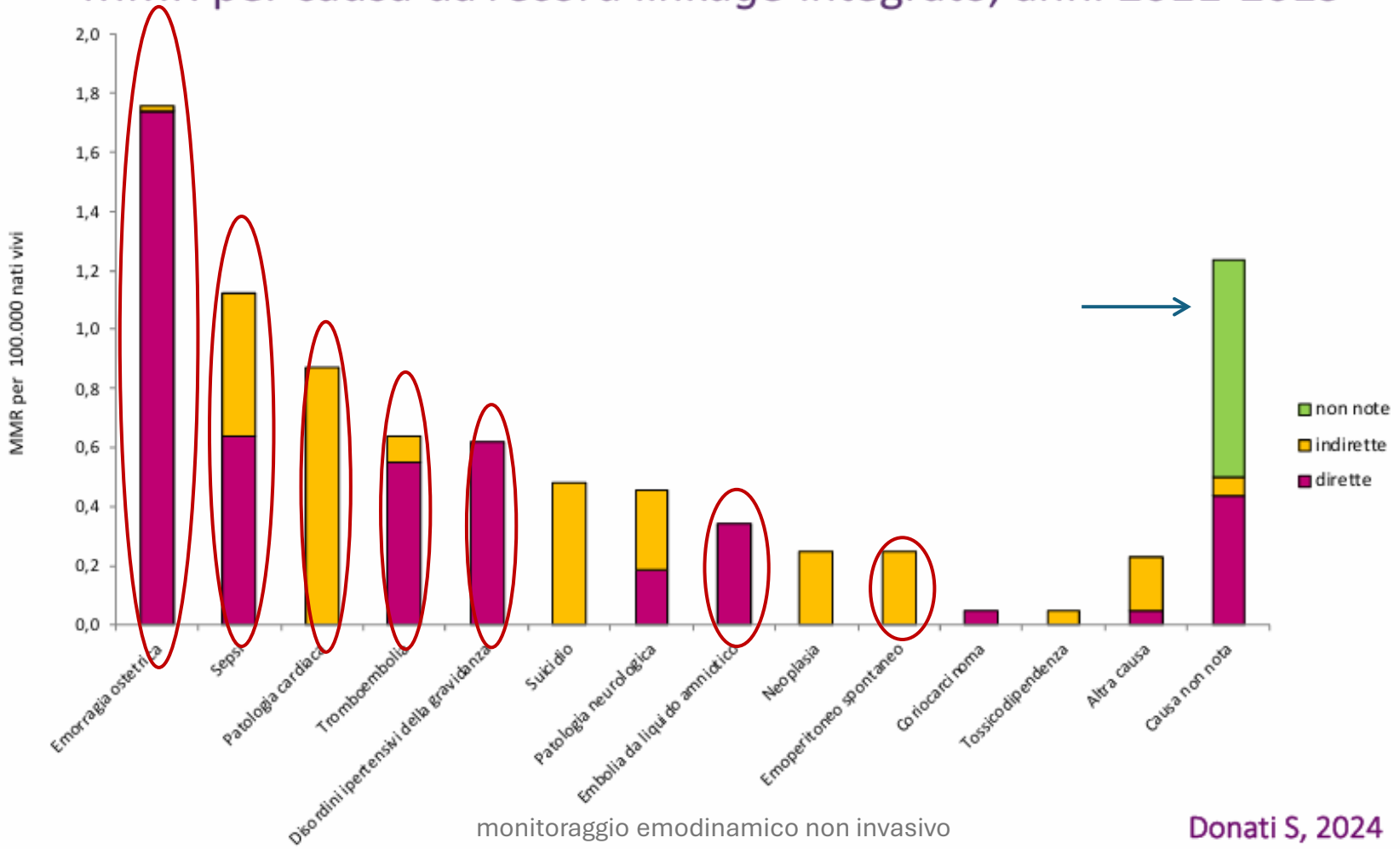
7-9 Novembre 2024

Presidente del congresso
Vanni Agnoletti
Domenico Pietro Santonastaso
Andrea Tognù

CHIARA SPINA MATER DEI HOSPITAL; BARI

MZ EVENTS

MMR per causa da *record linkage* integrato, anni 2011-2019



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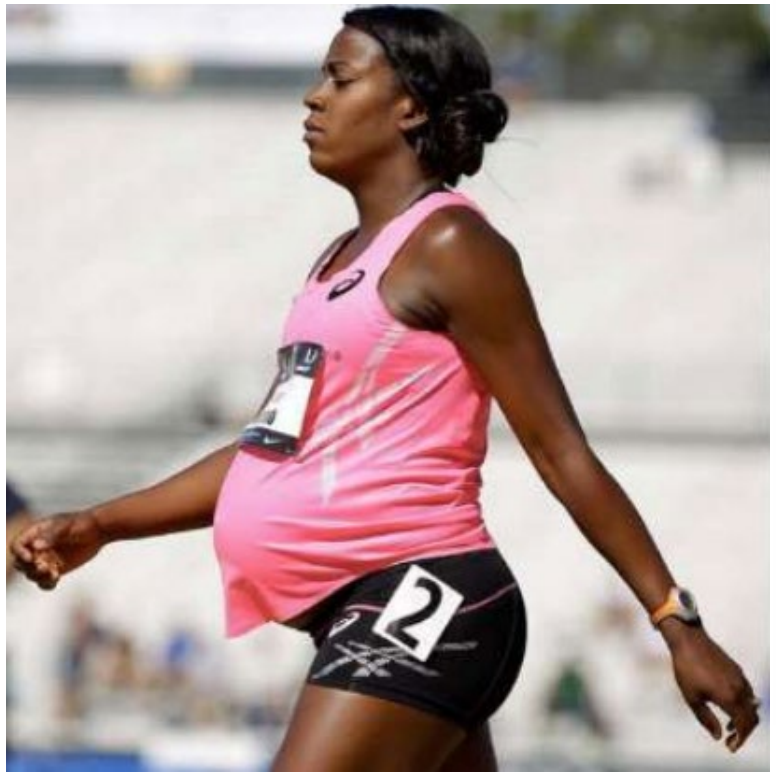
Donati S, 2024

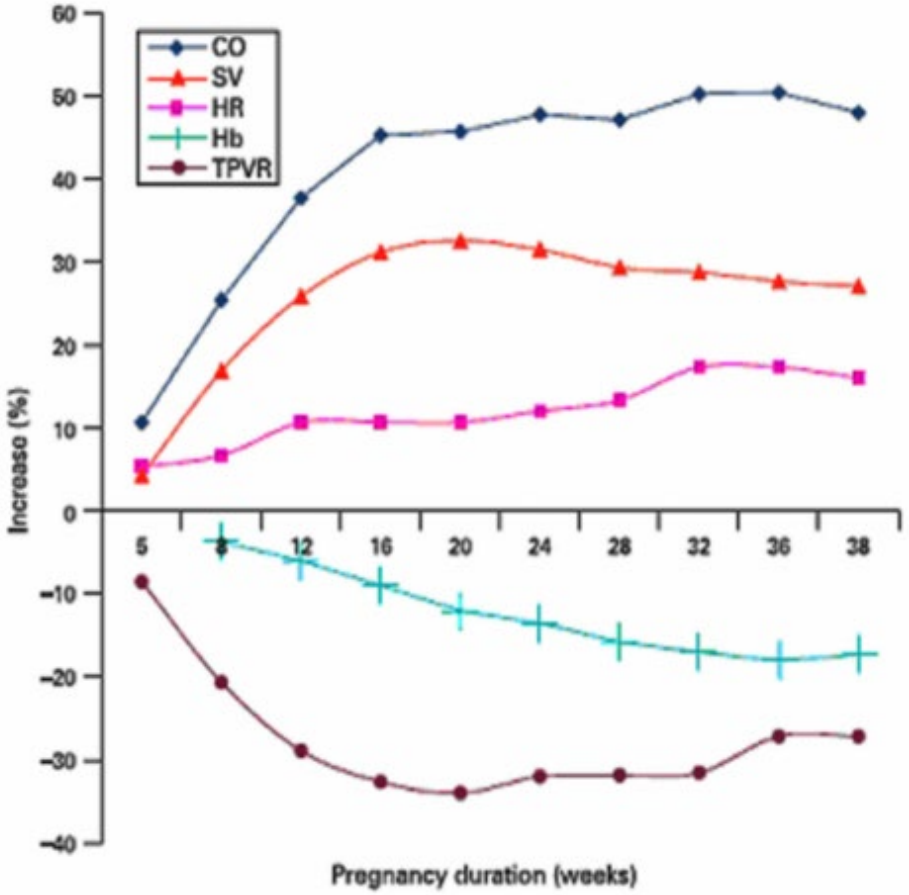
La Gravidanza: un test da Sforzo

Hemodynamic changes in pregnancy

K L Thornburg [1], S L Jacobson, G D Giraud, M J Morton

Seminars in Perinatology, 2000





↑ Portata

↓ Resistenze

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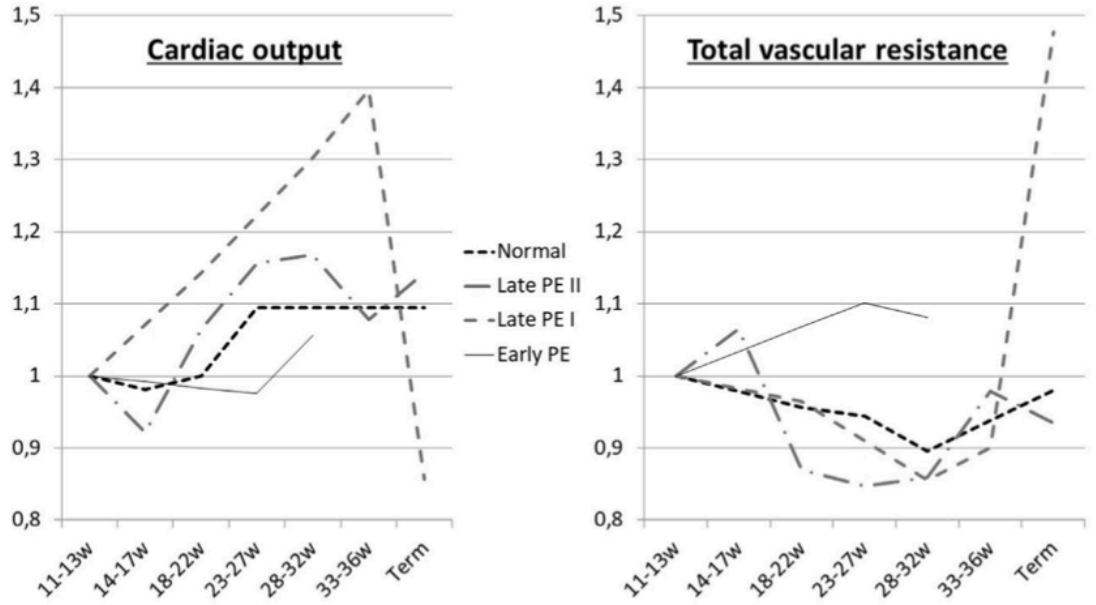
La Gravidanza: un test da Sforzo

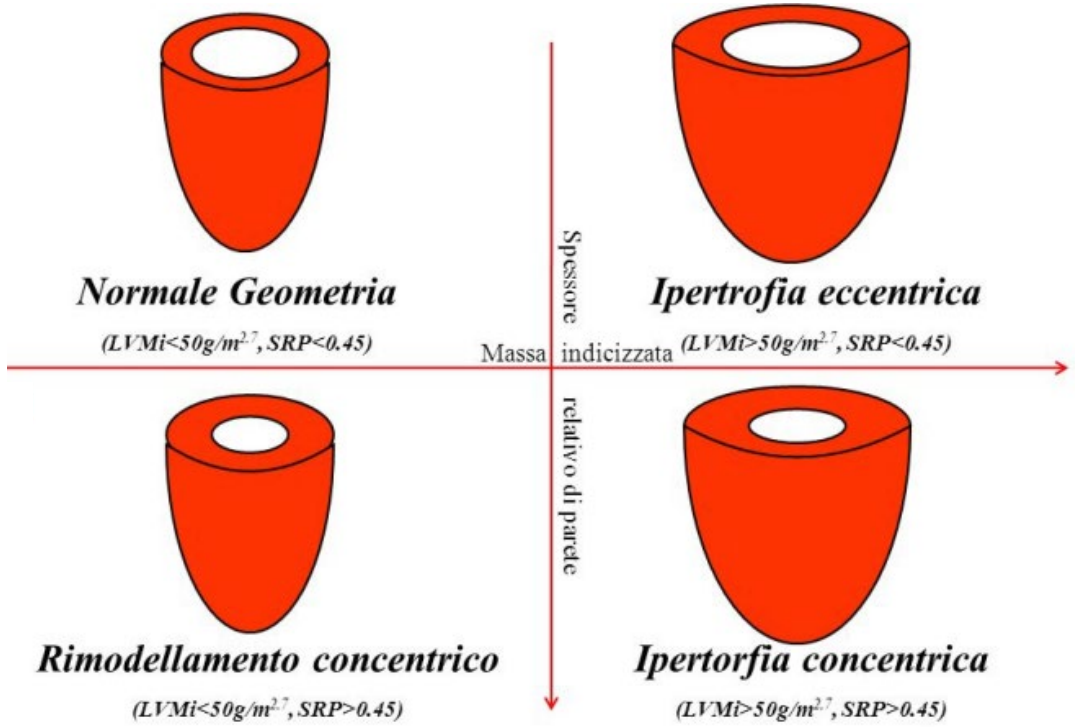
FIGURE 2
The longitudinal changes in cardiac output and peripheral resistance



Longitudinal changes in cardiac output and peripheral resistance expressed as a product of 12-week measurements, reported in normal pregnancies,[18] early-onset preeclampsia,[21] late-onset pre-eclampsia type I (crossover),[24] and late-onset preeclampsia type II (high-output).[28] Adapted from Gyselaers.[29]

PE, preeclampsia.

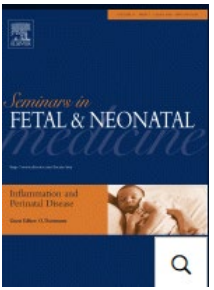
Masini. The two phenotypes of preeclampsia and differential treatments. Am J Obstet Gynecol 2022.

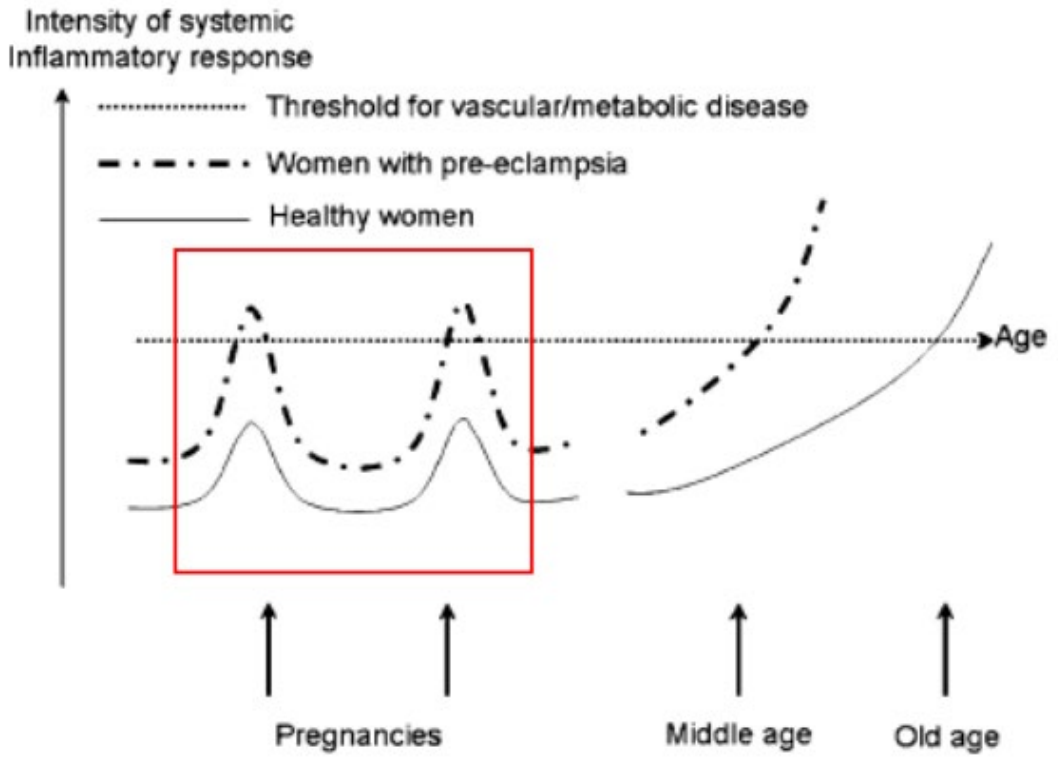


Pregnancy as a cardiac stress model

Eunhee Chung [1], Leslie A Leinwand

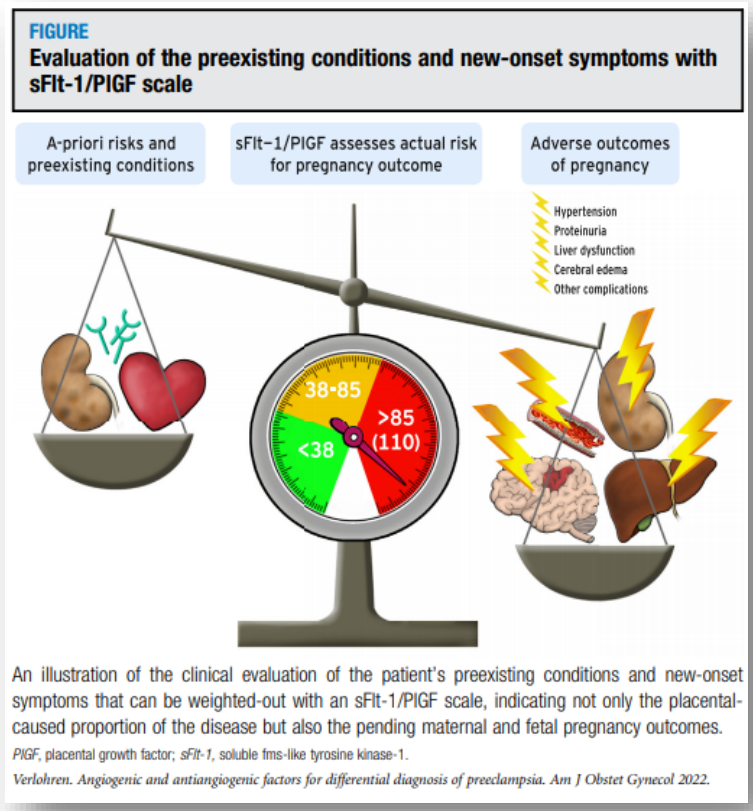
Cardiovasc Res, 2014 Mar 15





Inflammation and pre-eclampsia

A.M. Borzychowski · I.L. Sargent · C.W.G. Redman



Complement activation and regulation in preeclampsia and hemolysis, elevated liver enzymes, and low platelet count syndrome

Richard M. Burwick, MD, MPH; Bruce B. Feinberg, MD

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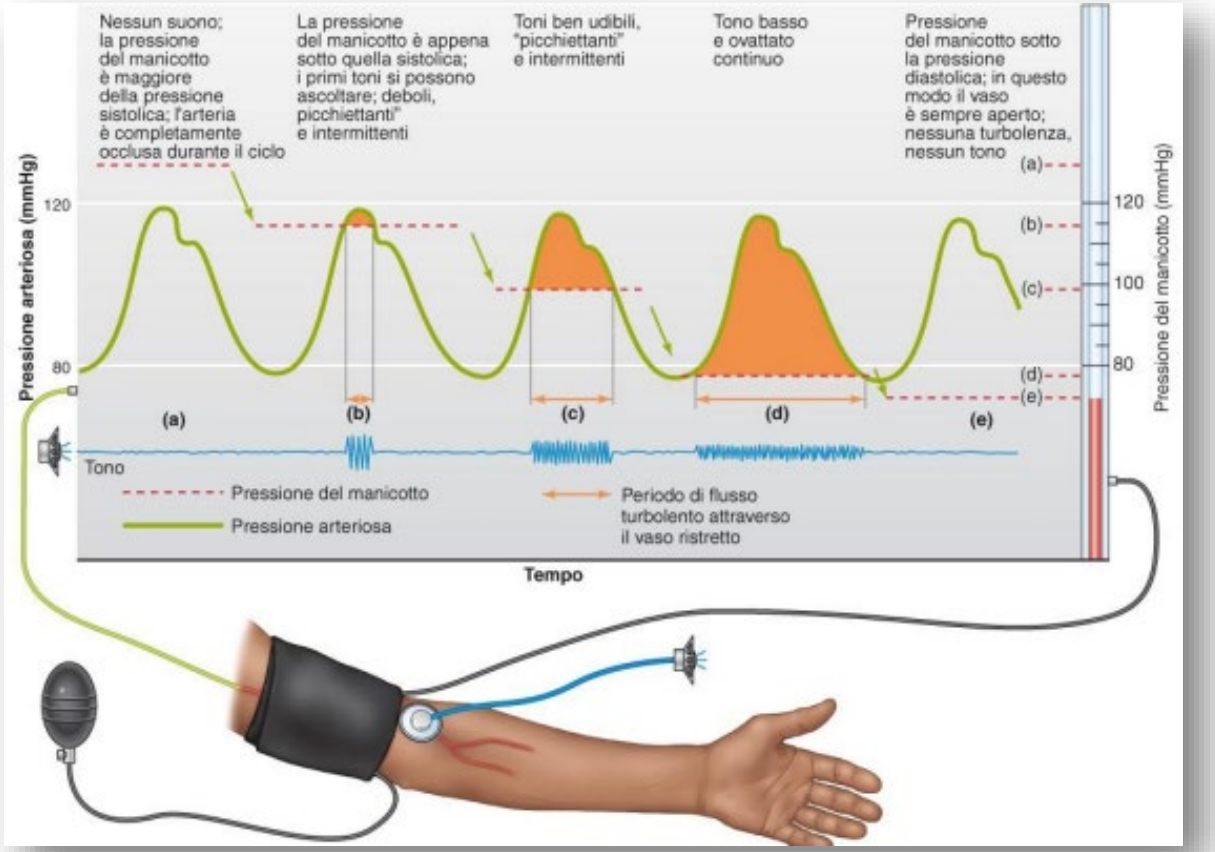
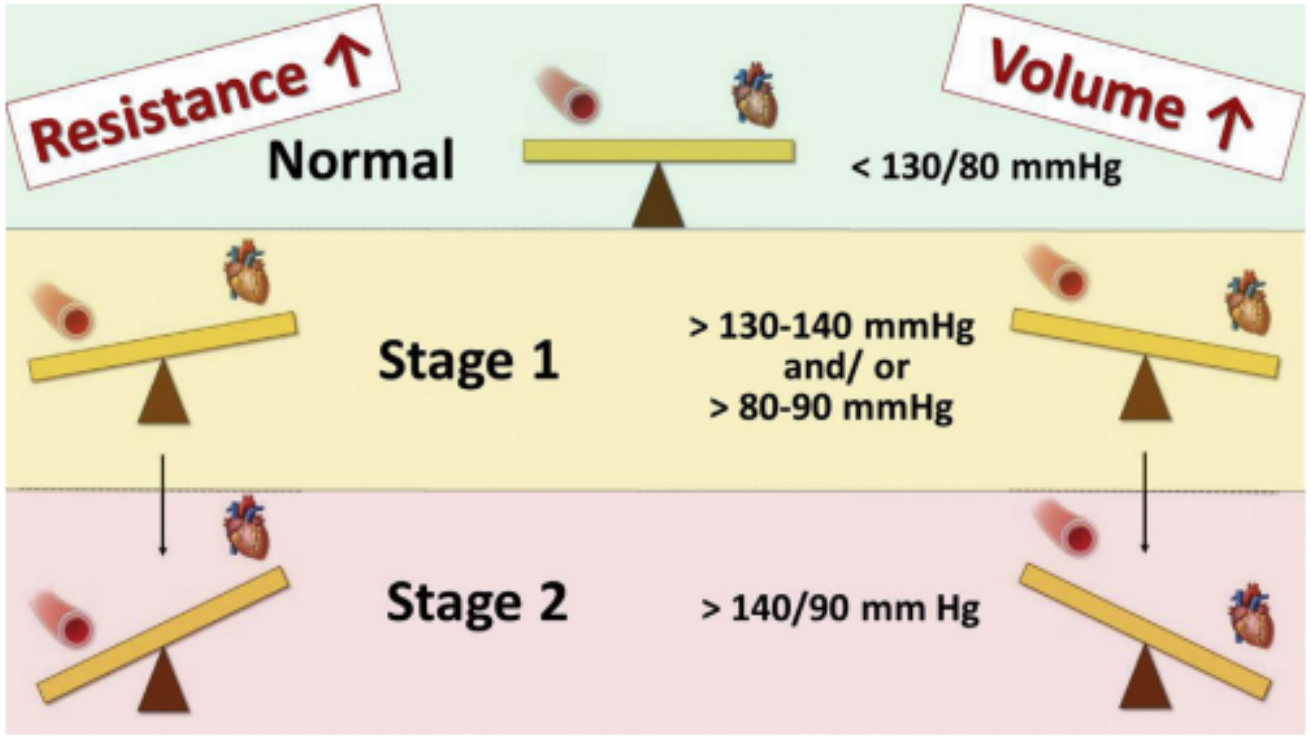
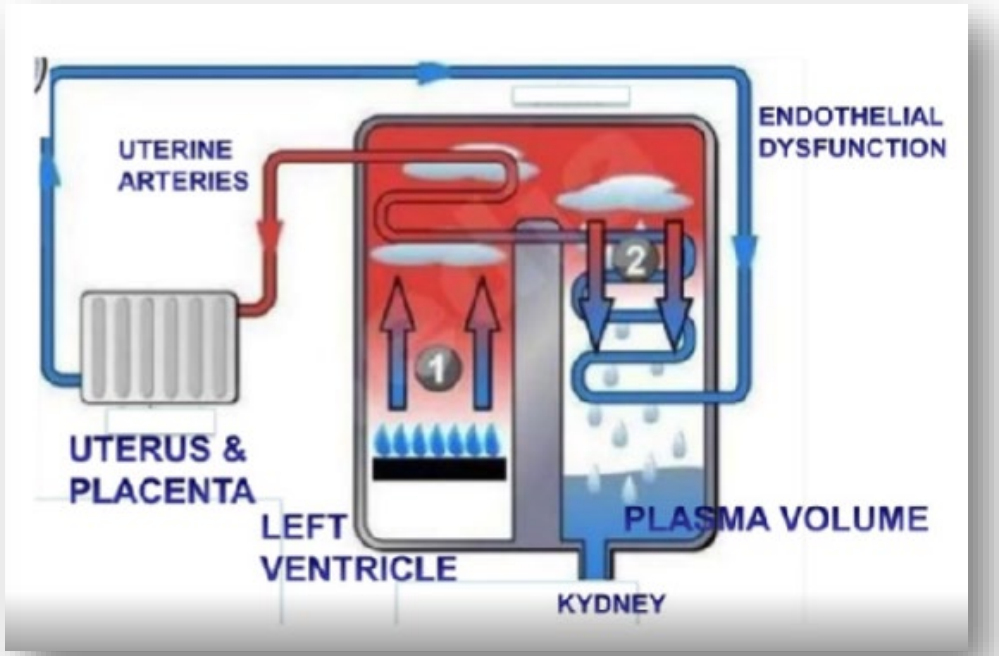


GUARDARE NON VUOL DIRE VEDERE

FIGURE 6
Schematic presentation of blood pressure as the product of cardiac output (*heart icon*) and peripheral resistance (*vessel icon*)



BP = CO x SVR



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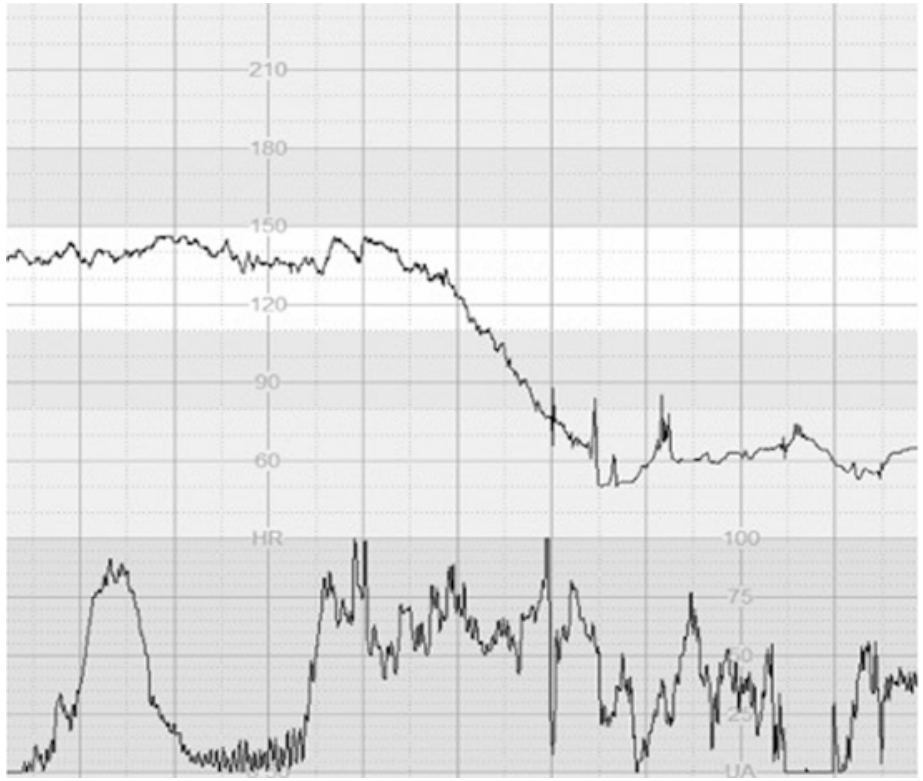
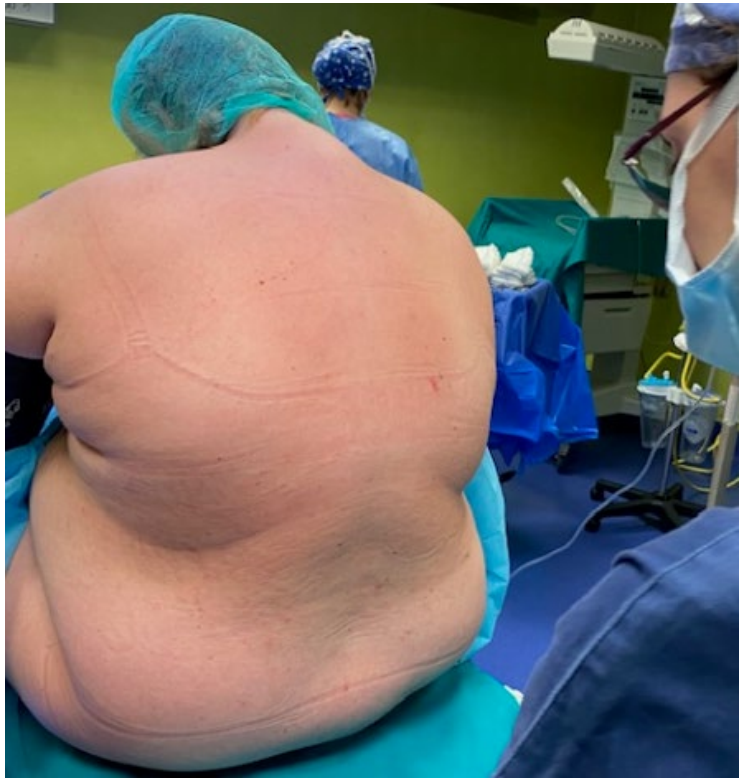
Gyselaers. Hemodynamic pathways of gestational hypertension and preeclampsia. Am J Obstet Gynecol 2022.

Cosa succede realmente?

Analgesia in Travaglio



Anestesia per TC



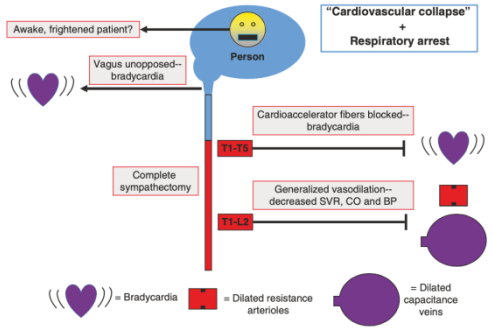
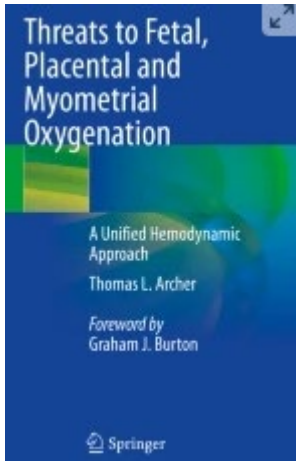


Fig. 9.2 A total spinal immediately blocks the sympathetic nervous system—even before it blocks the phrenic nerve to the diaphragm—so respiratory arrest is often due to hypotension and not diaphragmatic paralysis. In practice, this means that hypotension must be treated or prevented as one of the very first steps in management of the total spinal—and adequate doses of vasopressor need to be employed (e.g. ephedrine 15–25 mg IV and the early use of epinephrine 10–50 mcg IV, if indicated). Bradycardia should be treated immediately with atropine 0.4–1.0 mg. Once the patient is well oxygenated and stable hemodynamically, sedative or amnestic medications may be appropriate before intubation. *Abbreviations:* BP blood pressure, CO cardiac output, SVR systemic vascular resistance, VR venous return



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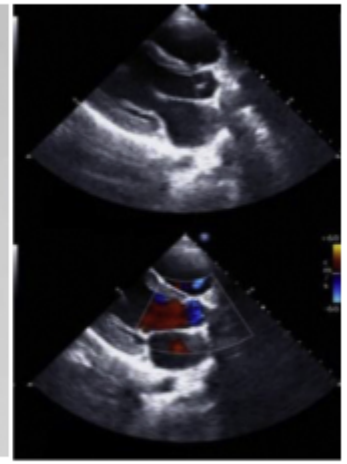
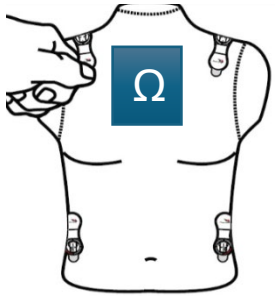
Ecografia
Doppler USCOM
Bioreattanza NICOM
Fotopletismografia ClearSight - Acumen Iq
PulseWaveAnalisys

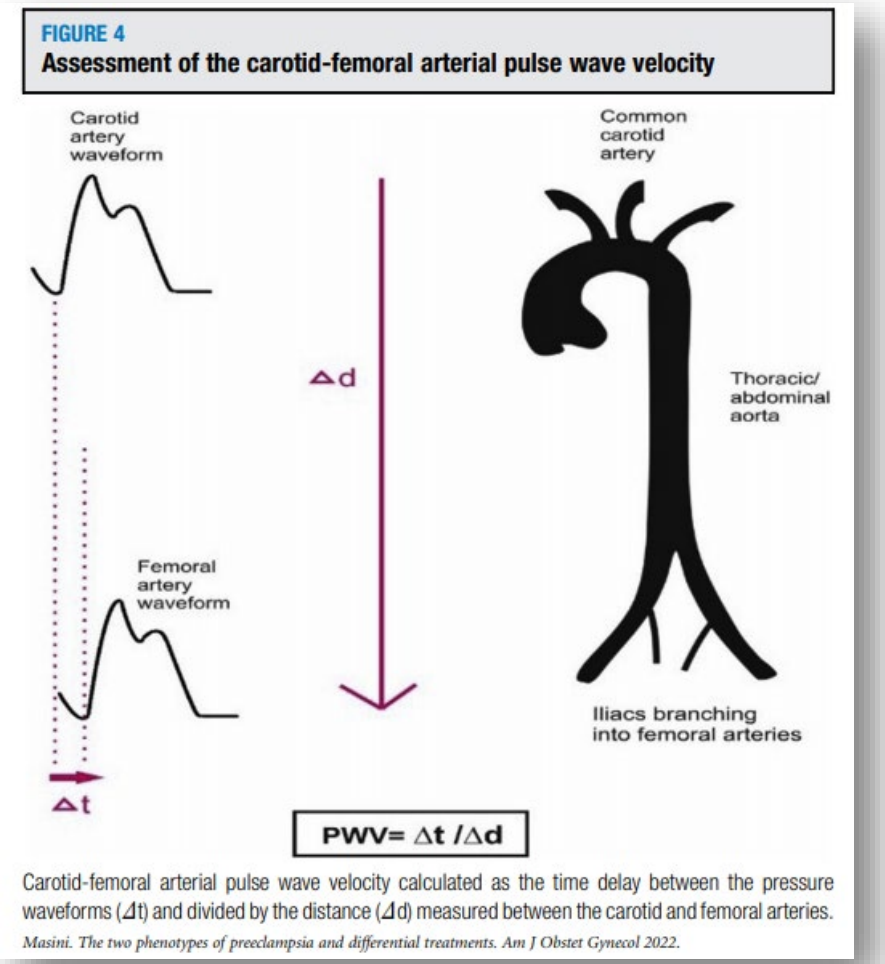
TABLE 2
Some of the methodologies commonly utilized to assess the maternal cardiac output

Inert gas rebreathing	Continuous suprasternal Doppler	Impedance cardiography	Transthoracic echocardiography
			
Minimal intraobserver variability, but expensive and requires ongoing consumable costs	No ongoing cost and validated against echocardiogram	Can be performed in the supine position and easy to operate	Machines and operators widely available; findings operator dependent

Masini. The two phenotypes of preeclampsia and differential treatments. Am J Obstet Gynecol 2022.

Schermata dei trend grafici sul monitor avanzato HemoSphere





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SV = Vti x CSA

CO =SV x HR

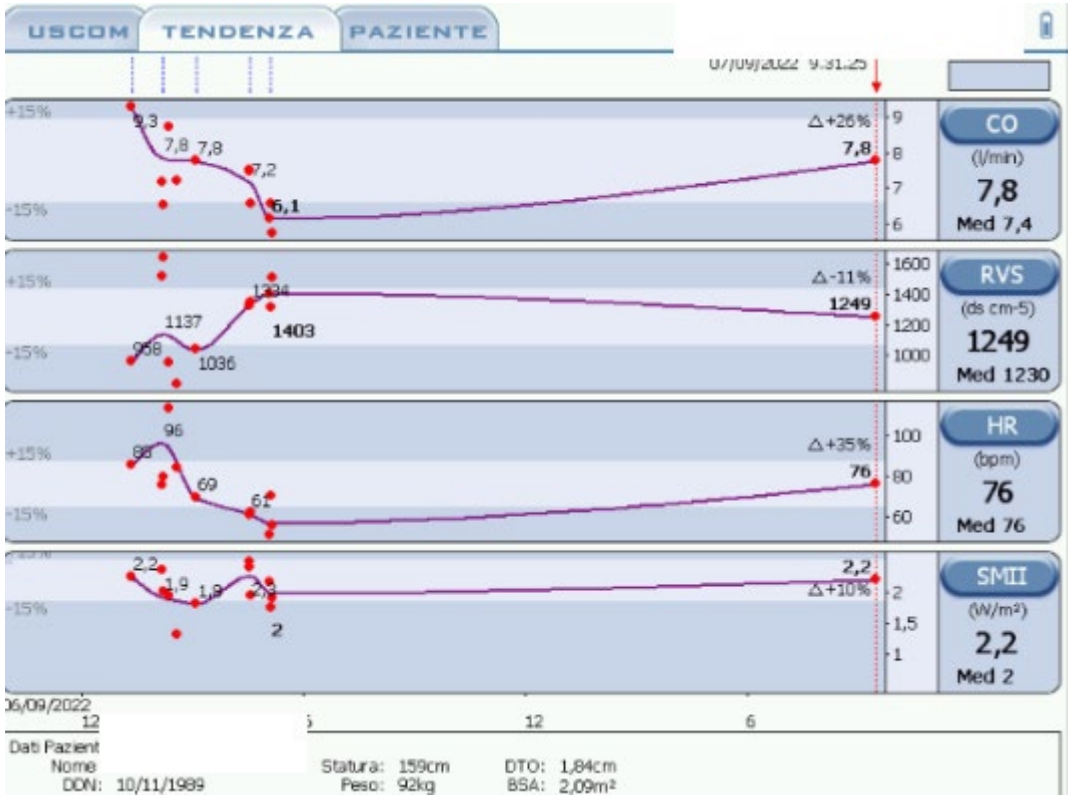
SVR = BP/CO

DO2 = co x caO2

(1,34xSpo2/100 x Hb)

SMII Watt/ m2

PKR = PE/KE ratio



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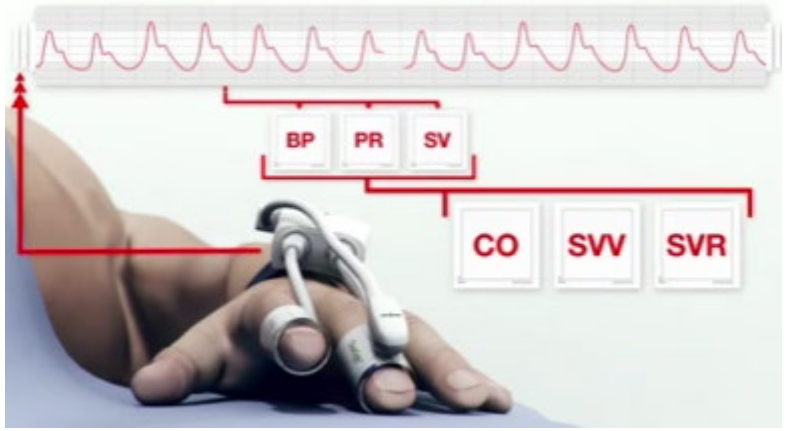
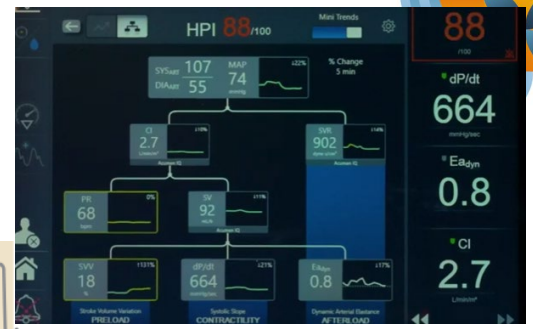
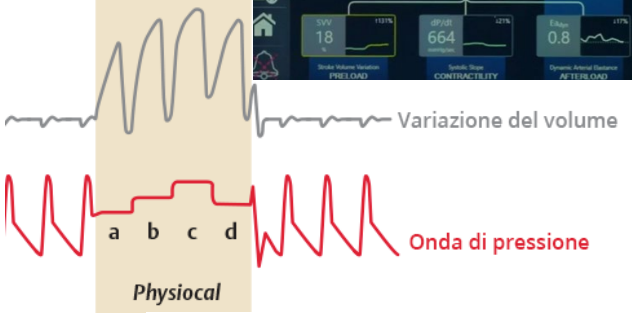
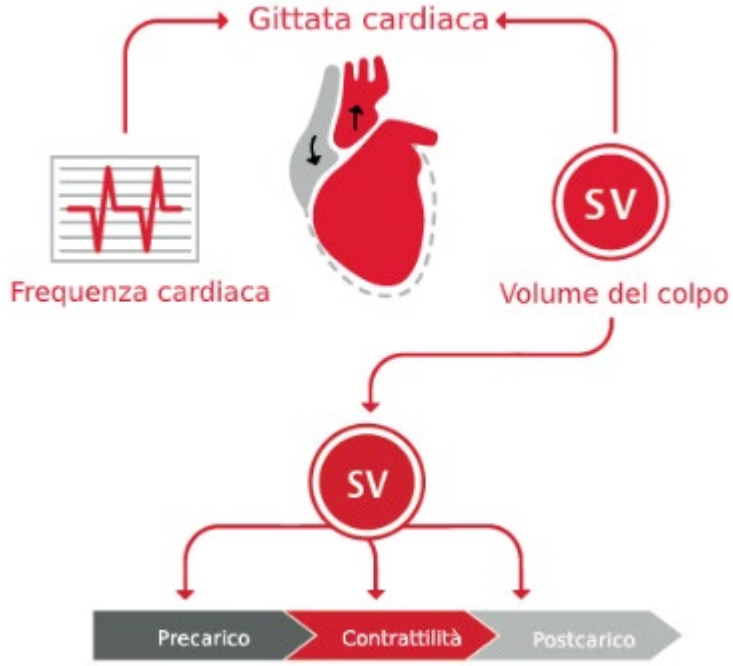
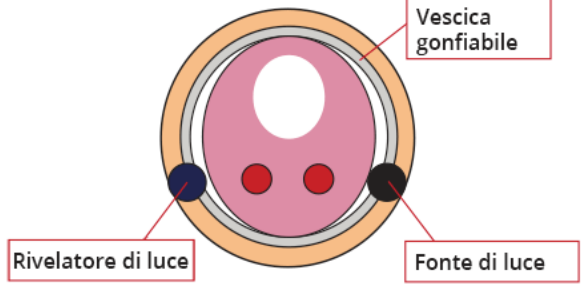


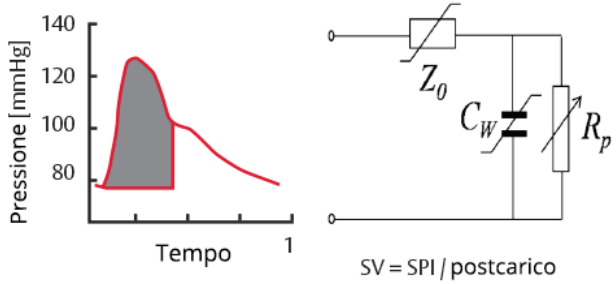
pletismografo

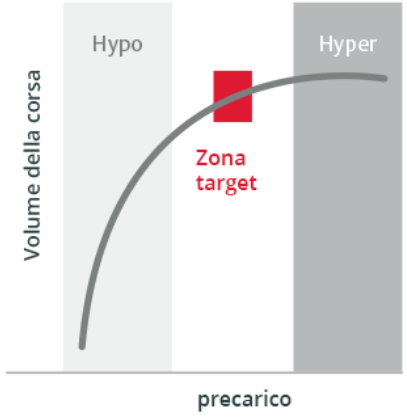












Relazione di Frank-Starling tra precarico e volume di eiezione (SV)

STUDY PROTOCOL O

Study protocol for the randomized controlled EVA (early vascular adjustments) trial: tailored treatment of mild hypertension in pregnancy to prevent severe hypertension and preeclampsia

Eva Mulder[1,2*], Chahinda Ghossein-Doha[3], Evine Appelman[1], Sander van Kuijk[4], Luc Smits[5], Rogier van der Zanden[6], Joris van Drongelen[7] and Marc Spaanderman[1,7]

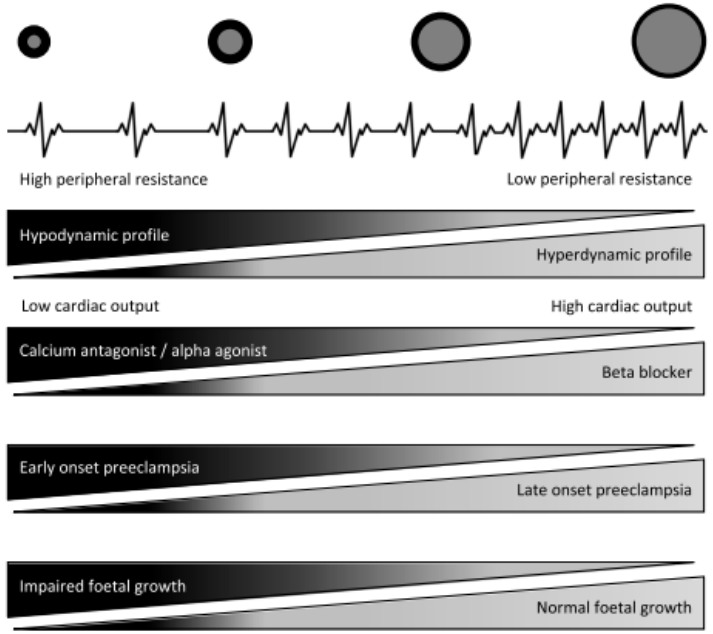


Fig. 1 Haemodynamic profiles in mild hypertension, associated complications and appropriate antihypertensive treatment

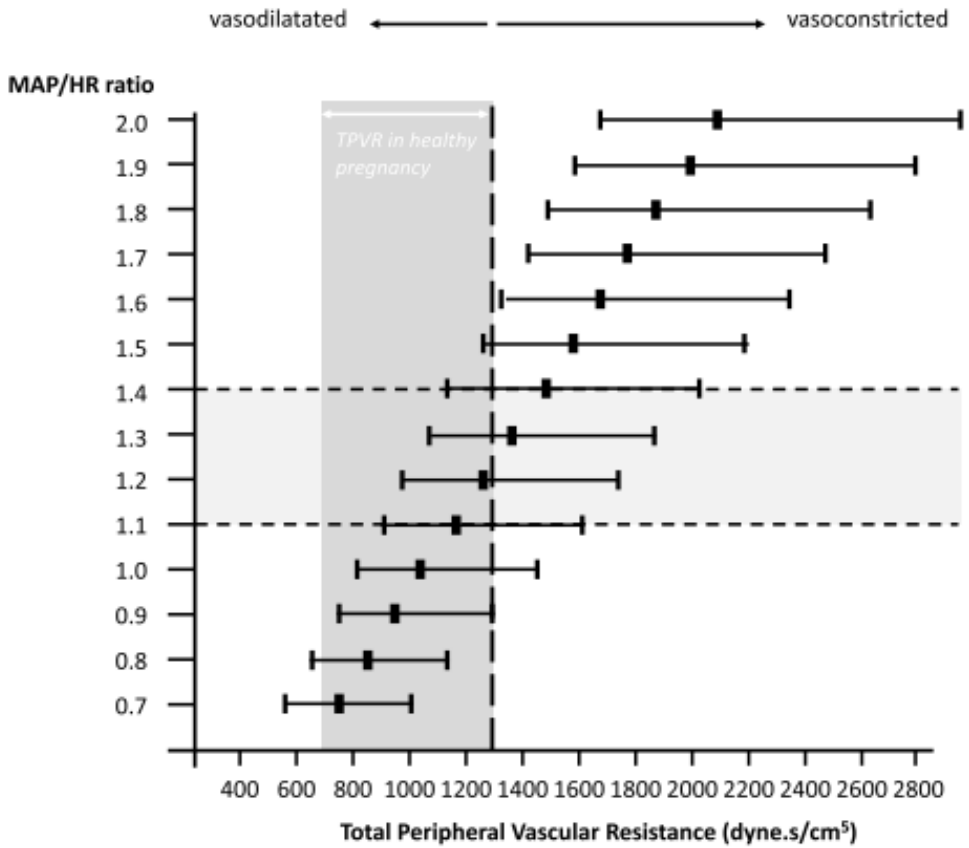


Fig. 4 Assessment of underlying haemodynamic profile by MAP/HR ratio and the likelihood of vasoconstricted, low output or vasodilated high-output hypertension

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De Bacher

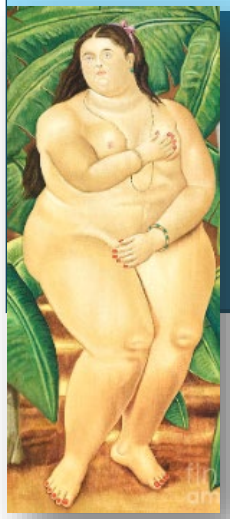
GEDV < 600 ml/M²	GEDV 600 - 1200 ml/M²	GEDV >1200 ml/M²
Decreased biventricular preload (absolute or relative hypovolemia?)	*Normovolemia *normal cardiac function *isolated RV dysfunction	*Hypervolemia *Cardiac dysfunction
Preload responsiveness is usually present	Preload responsiveness may be present or absent	Caution: does not rule out preload responsiveness

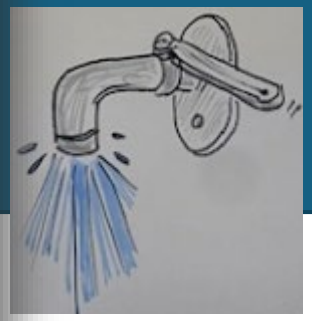
HYPERDYNAMIC

Low TPVR and high CO

TVPR <800 dynes·s·cm5

MAP/HR ratio <1.1
INFLAMMATION





NORMODYNAMIC

Normal TPVR and normal CO

TVPR 800 <1,300 dyne·s·cm 5

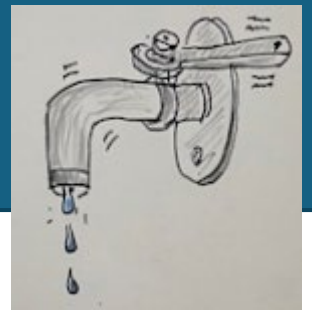
1.1 <MAP/HR ratio <1.4

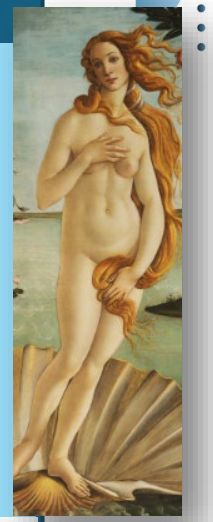
HYPODYNAMIC

High TPVR and low CO

TVPR >1,300 dynes·s·cm5

MAP/HR ratio >1.4
HYPOXIA





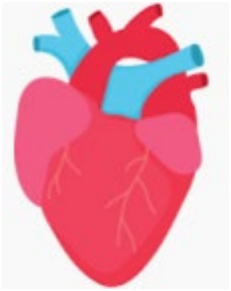
The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 JANUARY 7, 2016 VOL. 374 NO. 1

Predictive Value of the sFlt-1:PlGF Ratio in Women with Suspected Preeclampsia

Harald Zeisler, M.D., Elisa Llurba, M.D., Ph.D., Frederic Chantraine, M.D., Ph.D., Manu Vatish, M.B., Ch.B., D.Phil., Anne Cathrine Staff, M.D., Ph.D., Maria Sennström, M.D., Ph.D., Matts Olovsson, M.D., Ph.D., Shaun P. Brennecke, M.B., B.S., D.Phil., Holger Stepan, M.D., Deirdre Allegranza, B.A., Peter Dilba, M.Sc., Maria Schoedl, Ph.D., Martin Hund, Ph.D., and Stefan Verlohren, M.D., Ph.D.

sFlt-1/PlGF ratio		
< 38	**PREDIZIONE A BREVE TERMINE** (1 week rule out)	la paziente non svilupperà PE nella **settimana successiva** (VPN 99.1%)
38 – 85 (EARLY PE) **38 –110** (LATE PE)	**PREDIZIONE A BREVE TERMINE** (4 weeks rule in)	la paziente potrebbe sviluppare PE nelle **4 settimane successive**
≥ 85 (EARLY PE) **≥ 110** (LATE PE)	**DIAGNOSI**	**suggestivo di PE o altra forma di insufficienza placentare**

Zeisler H et al.; NEJM, 201



STUDY PROTOCOL O

Study protocol for the randomized controlled EVA (early vascular adjustments) trial: tailored treatment of mild hypertension in pregnancy to prevent severe hypertension and preeclampsia

Eva Mulder[1,2*], Chahinda Ghossein-Doha[3], Evine Appelman[1], Sander van Kuijk[4], Luc Smits[5], Rogier van der Zanden[6], Joris van Drongelen[7] and Marc Spaanderman[1,7]

Utilizzo di un algoritmo: MAP/FC materna nella scelta della terapia farmacologica

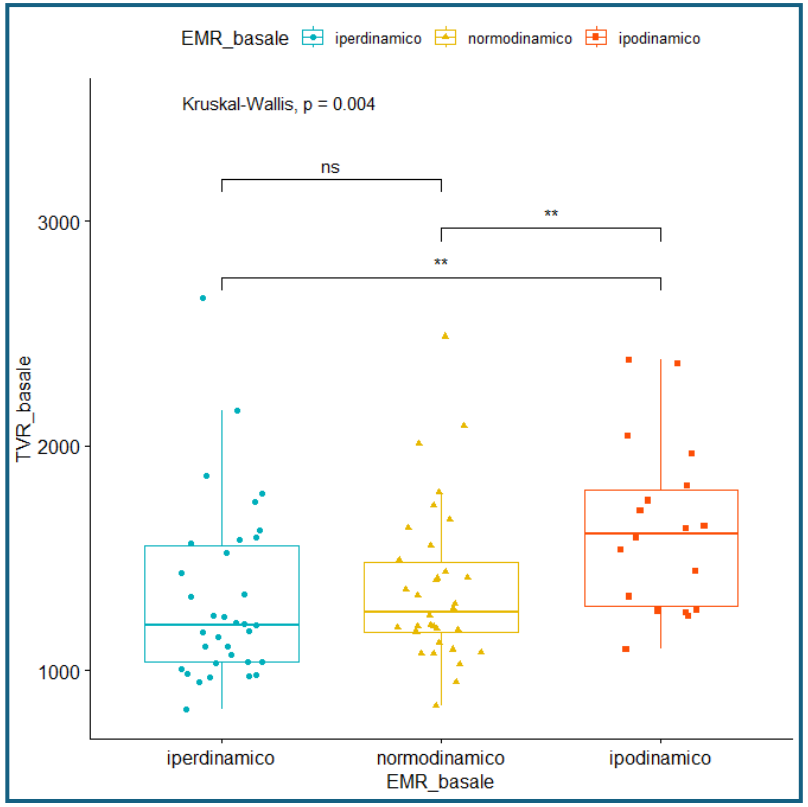
MAP/FC:≤1.1 ↓ FC e PA!

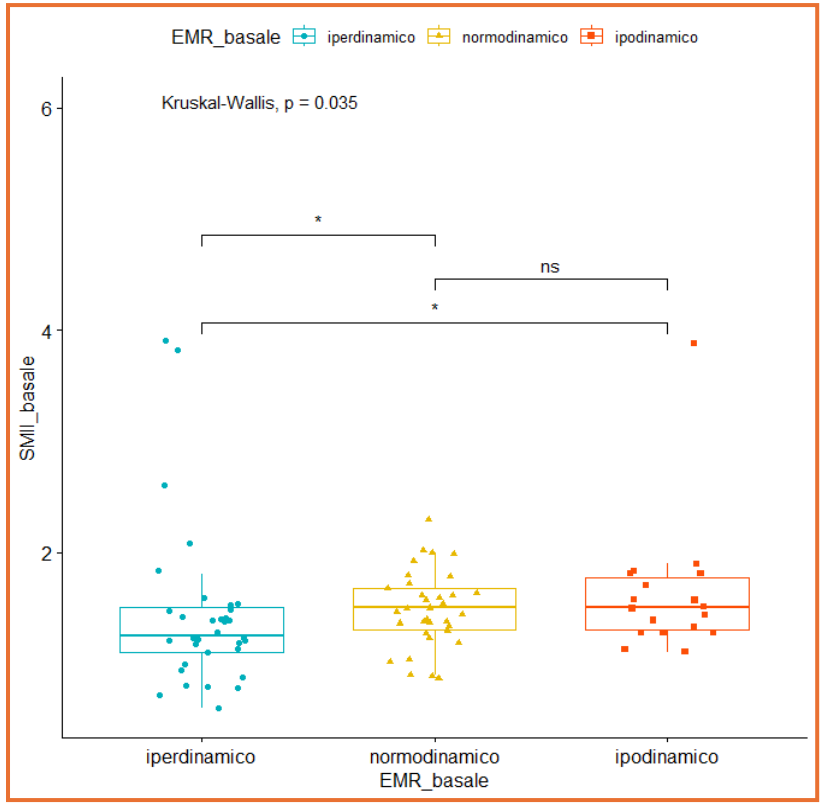
1.1 <MAP/FC:<1.4 ↓ PA!

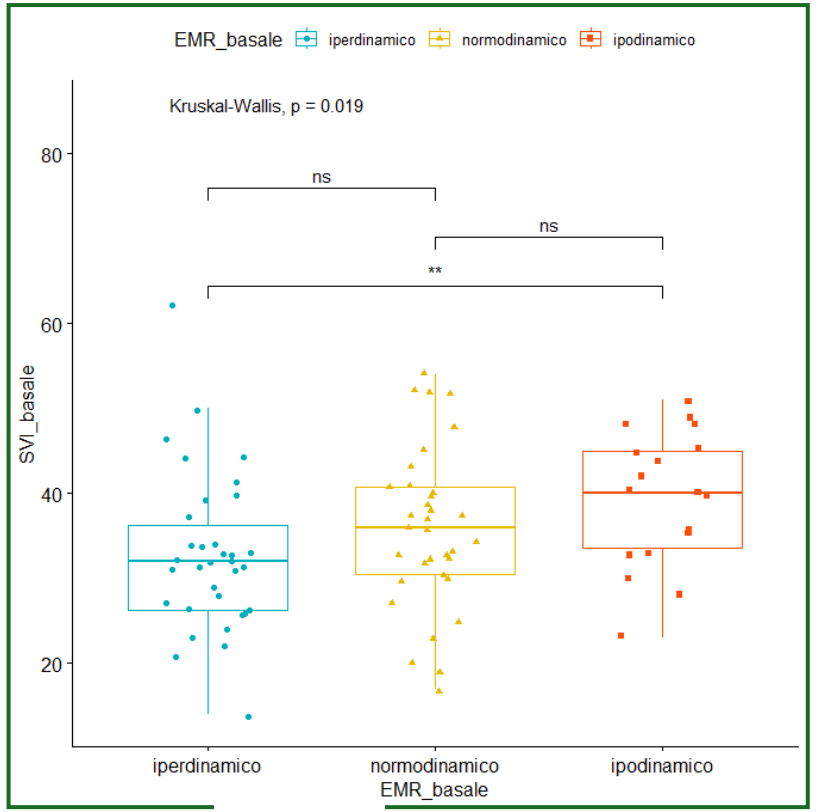
MAP/FC:>1.4 ↓ FC Resistenze periferiche

GEDV < 600 ml/M²	GEDV 600 - 1200 ml/M²	GEDV >1200 ml/M²
Decreased biventricular preload (absolute or relative hypovolemia?)	*Normovolemia *normal cardiac function *isolated RV dysfunction	*Hypervolemia *Cardiac dysfunction
Preload responsiveness is usually present	Preload responsiveness may be present or absent	Caution: does not rule out preload responsiveness

Ruolo del rapporto MAP/HR nella discriminazione dei profili emodinamici dopo anestesia spinale per T.C.: studio USCOM







F.Di Maglie, studio in corso

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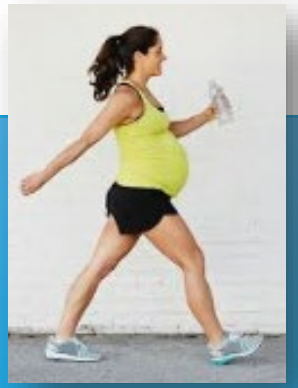
UTILITA'



- Identificazione dei profili Emodinamici
- Prevenzione di eventi materno-fetali in travaglio e scelte farmacologiche
- Ottimizzazione della terapia fluidica/ vasopressoria durante TC, eventi emorragici, settici

Grazie !