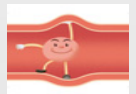
A holistic view of the vascular mechanics addressed to the clinical diagnosis of Arterial Hypertension.

RICARDO ARMENTANO



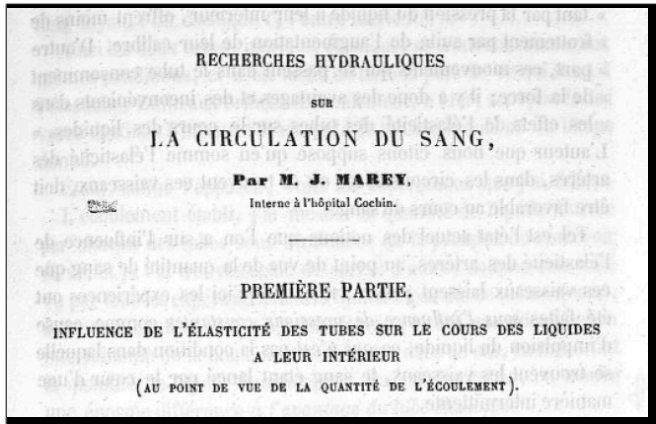
IFBME
Working Groups
Global Citizen Safety and Security

UNIVERSIDAD FAVALORO

ETIENNE-JULES MAREY

Recherches Hydrauliques sur la circulation du sang

Circa 1857



RECHERCHES HYDRAULIQUES

SUR

LA CIRCULATION DU SANG,

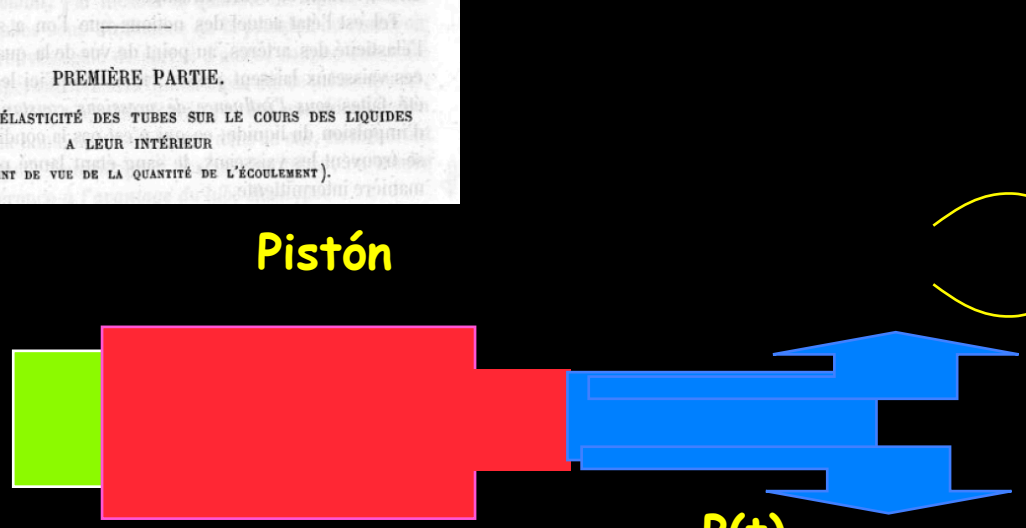
Par M. J. MAREY,

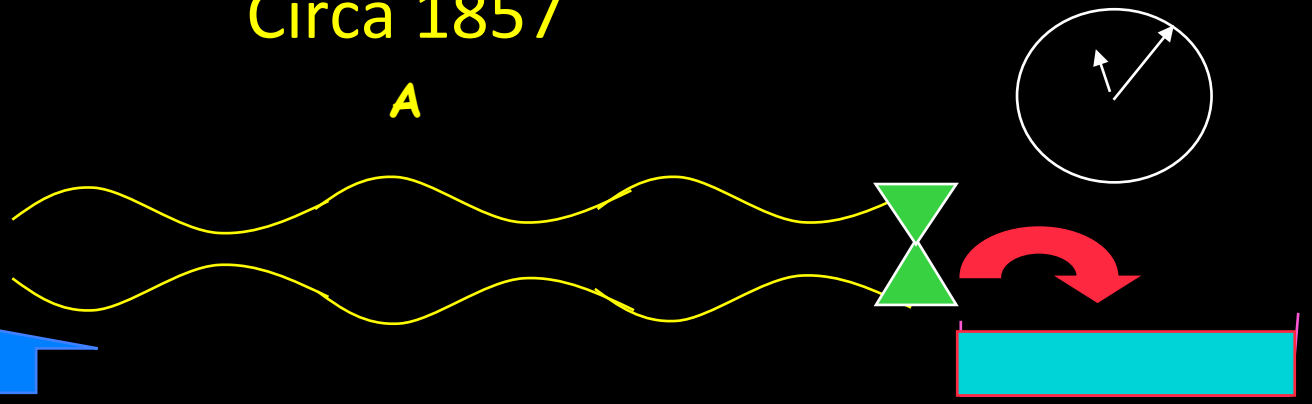
Interne à l'hôpital Cochin.

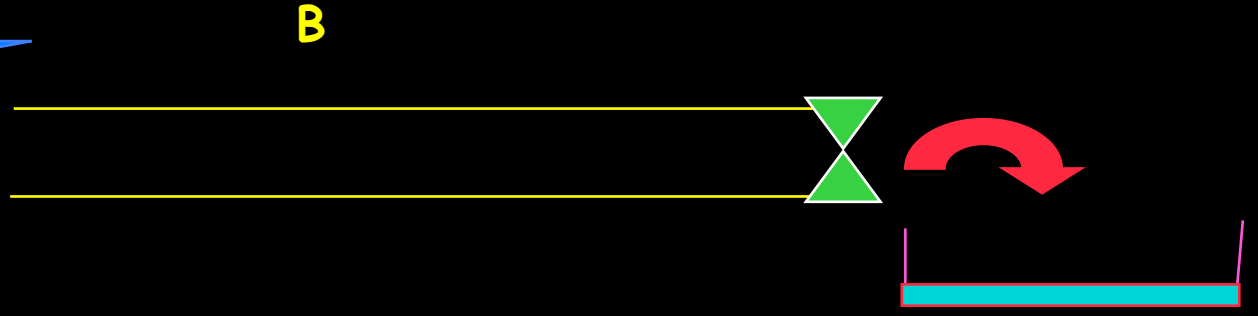
PREMIÈRE PARTIE.

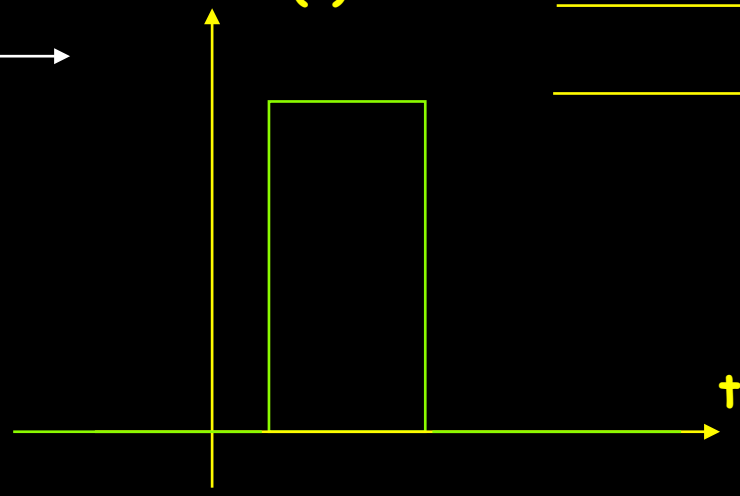
INFLUENCE DE L'ÉLASTICITÉ DES TUBES SUR LE COURS DES LIQUIDES A LEUR INTÉRIEUR

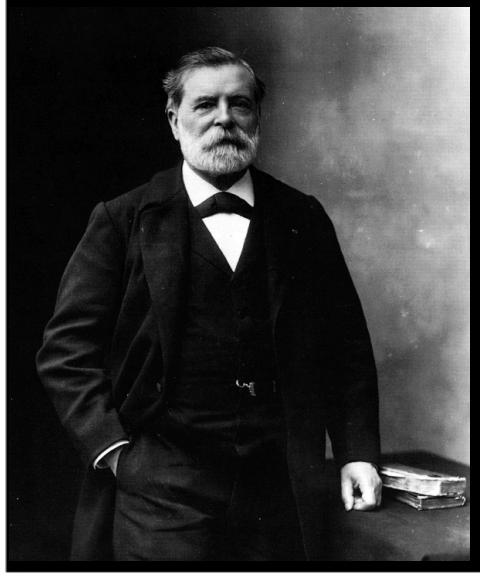
(AU POINT DE VUE DE LA QUANTITÉ DE L'ÉCOULEMENT).











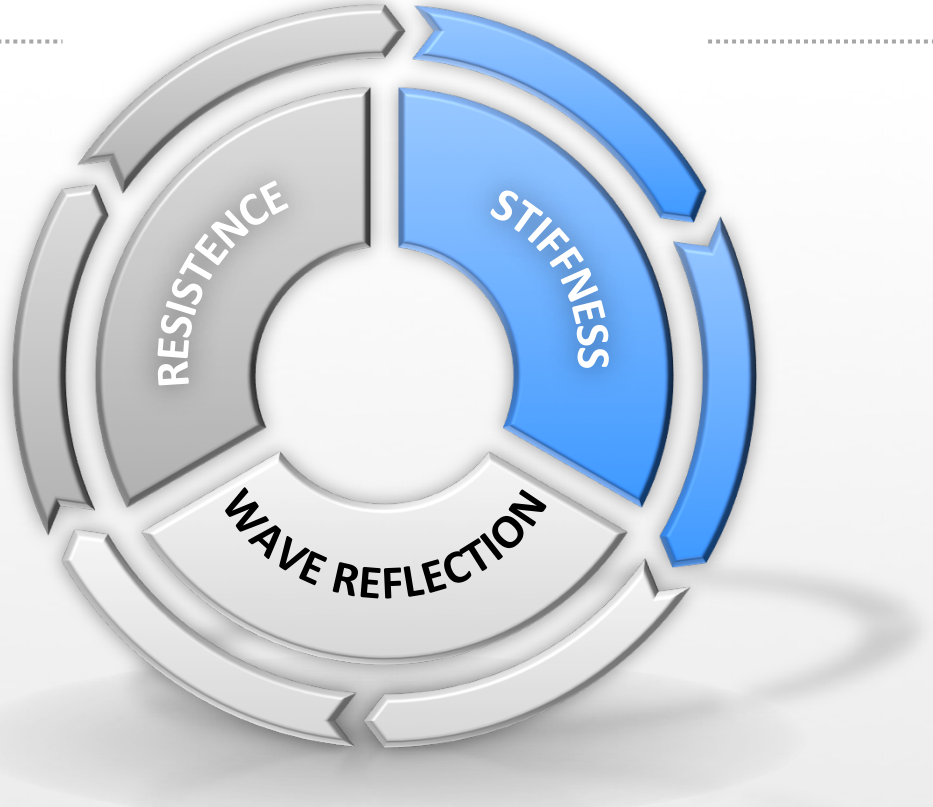
ARTERIAL IMPEDANCE

HYDRAULIC LOAD

RESISTENCE

MICROCIRCULATION

POISEUILLE LAW



STIFFNESS

ARTERIAL STIFFNESS

HOOKE LAW

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WAVE REFLECTION

CENTRAL PULSE WAVE ANALYSIS & AUGMENTATION INDEX

UNIVERSIDAD FAVALORO

ARTERIAL STIFFENING & Blood Pressure Waveform Complexity

Arterial stiffening and probably earliest arrival of reflected waves produce an unwrinkling of femoral arterial pressure, independently of the arterial pressure level

1 Arterial fe stiffening (AS) was confirmed by increases of Ceff, Epd and β with respect to ca ($p<0.05$*)

2 Concomitantly, a decrease in fe BP waveform FD was observed ($p<0.05$*).

3 FD and Epd ($r=-0.47$, $p<0.05$) and FD and β ($r=-0.48$, $p<0.05$) were inversely related while non-correlation was found between Ceff and FD for the whole pool of data

4 Arterial PP and AI were higher in Fe than in Ca ($p<0.05$).

*Paired t test ($p<0.05$)

Blood Pressure Waveform Complexity Provides Insightful Information About Arterial System Dynamics
34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)

WAVE REFLECTION & Blood Pressure Waveform Complexity

in both the aorta and the iliofemoral artery, arterial clamping and unclamping significantly modify the Augmentation Index normalized to 75 beats-per-minute and the Fractal Dimension (FD).

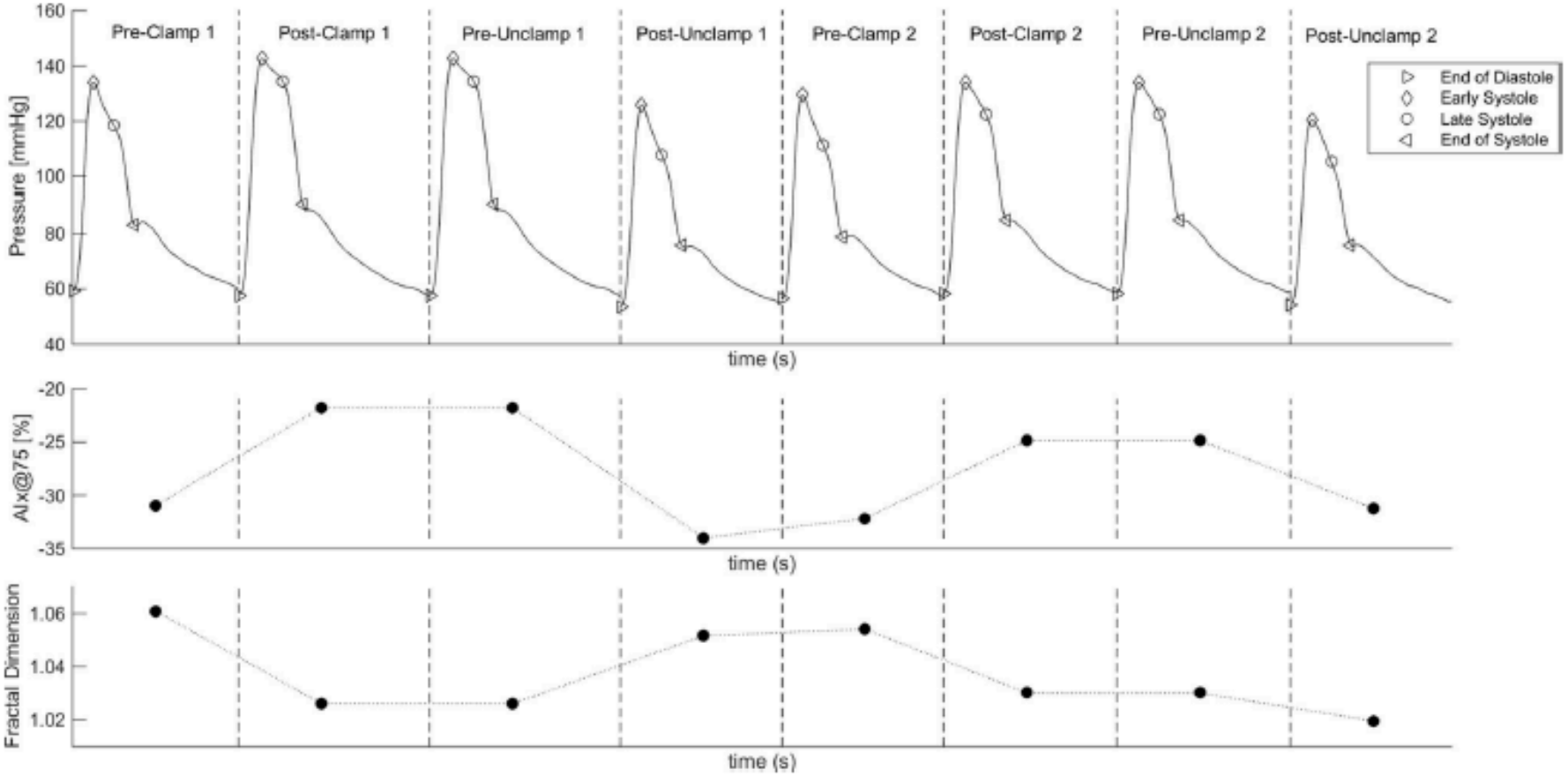


Fig. 2 Average arterial radial pressure tracings over 20-s intervals before and after each event (clamping/unclamping) for one representative patient undergoing vascular surgery. The end of diastole, end of systole, early systole and late systole pressures were detected on arterial pressure tracings. The Augmentation Index normalized to 75 beats-per-minute (AIx@75) and the Fractal Dimension (FD) were calculated for each state

Health Technol.
DOI 10.1007/s12553-016-0141-7

ORIGINAL PAPER

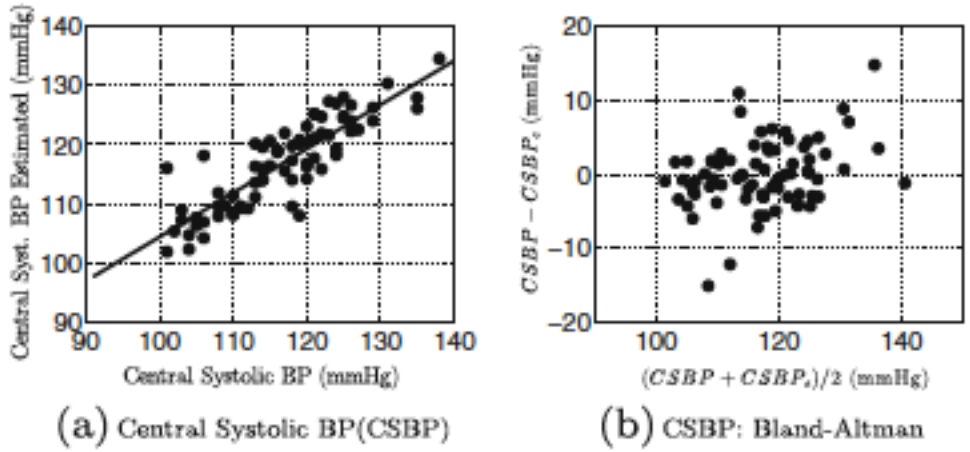
Impact of arterial cross-clamping during vascular surgery on arterial stiffness measured by the augmentation index and fractal dimension of arterial pressure

M. T. Politi[1] · S. A. Wray[2,3] · J. M. Fernández[1] · J. Gaudric[4] · A. Ghigo[4] · P. Y. Lagrée[4] · C. Capurro[4] · J. M. Fullana[4] · R. Armentano[2,3]

CENTRAL PULSE WAVE ANALYSIS by wearable system

The scope of this pilot work is to provide initial validation of this method in order to develop a compact miniaturized device that allows the integration of wireless central blood pressure monitoring into a wearable system

Fig. 4 Mesurements vs Estimation (linear regression) and Bland-Altman plot, N=77



Health Technol.
DOI 10.1007/s12553-016-0149-z

ORIGINAL PAPER

Central blood pressure monitoring method oriented to wearable devices

Germán Fierro[1] · Fernando Silveira[2] · Ricardo Armentano[1]

Questions?


Thank you !