

PULSE THERAPY[®]

STENDO



SCIENTIFIC REFERENCES

HEMODYNAMIC

ENDOTHELIUM

NITRIC OXYDE

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01. PROOFS OF CONCEPT

- **The forgotten driving forces in right heart failure : new concept and device**
Sayed Nour 1, Guifu Wu, Zheng Zhensheng, Juan C Chachques, Alain Carpentier, Didier Payen · Asian Cardiovasc Thorac Ann · 2009 Oct;17 
- **Forgotten driving forces in right heart failure (Part II): experimental study**
Sayed Nour 1, Gang Dai, Qinmei Wang, Fei Wang, Juan Carlos Chachques, Guifu Wu · Asian Cardiovasc Thorac Ann · 2012 Dec;20 
- **Nouvelle théorie hémodynamique “ flux et rythme ” : concept et applications précliniques en utilisant des nouveaux dispositifs d’assistance circulatoire directeur.** New hemodynamic theory of «flow and rhythm» : concept and preclinical applications using new guided circulatory support devices.
Université Paris Sud - Paris XI, 2012. Français. Sayed Nour / Directeur de thèse PhD : Juan Carlos CHACHQUES Professeur, Directeur Recherche HEGP / Président du jury : Alain CARPENTIER Professeur des Universités, HEGP 

02. TOLERANCE STUDIES

- **Étude de tolérance du dispositif Stendo® chez les sujets sains**
Tolerance study of the Stendo® device in healthy subjects
Dr Charles Damoiseil, Dr Anne-Claire Lukaszewicz, Dr Laure Goudon de la Lande, Pr Didier Payen de la Garanderie - 2012 Janv - *Hôpital Lariboisière, 2 rue Ambroise Paré, 75475 Paris Cedex 10 / Université Paris 7 Denis Diderot*
- **Étude de tolérance du dispositif Stendo® V3 chez les patients atteints d’insuffisance cardiaque**
Safety study of the Stendo® V3 device in patients with heart failure
Dr Catherine Monpere - *Centre Bois Gibert, 37510 Ballan-Mire - 10 patients*
- **Evaluation clinique dermatologique de la tolérance d’un pantalon pulsatile Stendo®**
Clinical dermatological evaluation of the tolerance of a Stendo® pulsatile pant
Laboratoire privé Spincontrol, 238 rue Giraudeau, 37000 Tours - 33 personnes

03. PUBLISHED CLINICAL STUDIES

- **Low-pressure sequential compression of lower limbs enhances forearm skin blood flow**

Guy Amah 1, Sebastian Voicu, Philippe Bonnin, Nathalie Kubis. - Clin Invest Med. 2016 Dec 1

[Link/liens
Pubmed](#)

- **Efficacy of the Stendo® Pulsating suit in patients with leg lymphedema: a pilot randomized study**

Patrick Jonas 1, Stéphane Charlois 1, Mélanie Chevalerias 1, Dominique Delmas 2, Jean-Charles Kerihuel 3, Philippe Blanchemaison 4 - Eur J Dermatol. 2016 Jan-Feb.

[Link/liens
Pubmed](#)

- **Effects of single and multiple sessions of lower body diastole-synchronized compressions using a pulsating pneumatic suit on endothelium function and metabolic parameters in patients with type 2 diabetes: two controlled cross-over studies**

Paul Valensi 1, Nicolas Barber-Chamoux 2, Amel Rezki 3, Céline Lambert 4, Bruno Pereira 4, Christian Dualé 5, Dominique Delmas 6, Martine Duclos 7 - Cardiovasc Diabetol. 2022 Dec 22

[Link/liens
Pubmed](#)

04. OTHER CLINICAL STUDIES

BEAUTY & WELLNESS

- **Evaluation of the effectiveness of Stendo® FACE**

Laboratoire EUROFINS - 2022

- **La combinaison Stendo®, les amas graisseux d'origine circulatoire (lourdeur et gonflement des jambes)**

The Stendo® combination, fatty deposits of circulatory origin (heaviness and swelling of the legs)

Pr Raphaël BLAIRVACQ - Bruxelles/Liège Belgium - 2013 Dec - 54 patients

MEDICAL

- **Analyse de l'activité lymphatique après une séance de Stendo® V3 sur des patients présentant un lymphoedème des membres inférieurs (MI) - Contrôle par lymphoscintigraphie**

Analysis of lymphatic activity after a Stendo® V3 session on patients with lower limb lymphedema (MI) - Control by lymphoscintigraphy

Groupe R&D Clinical Applications Fluorescence Imaging Multidisciplinary Clinic of Lymphology / Professeur Bourgeois - Institut Jules Bordet - 121, Bd de Waterloo, B-1000, Brussels, Belgium

- **Etudes des effets de la Pulsothérapie Stendo® : analyses cognitives et émotionnelles**

Studies on the effects of Stendo® Pulsotherapy: Cognitive and emotional analysis

Pr Arnaud Aubert - Laboratoire privé Spincontrol, 238 rue Giraudeau, 37000 Tours 2012 - 33 persons

- **Insuffisance cardiaque, amélioration du processus de réadaptation grâce à Stendo®**

Heart failure, improving the rehabilitation process with Stendo®

Dr. Véronique Eder - Poster and Minnesota Test - Multi-centric - 2018 - 50 patients

- **Use of a pulsatile mask in the treatment of acute or chronic cerebral pathologies with an ischaemic component (feasibility study)**

Cardio Innovative Systems - Cardiology Research Laboratory 75002-Paris PTR « Feasibility Study » N° 10-0 June 26th 2015

SPORT

- **Test observationnel des effets d'une séance de stimulation pulsatile cardio-synchronisée Stendo® sur la charge interne de l'athlète**

Observational test of the effects of a Stendo® pulsatile stimulation session on the athlete's internal load

RP Performance - Lyon / 88 footballeurs amateurs

05. **BIBLIOGRAPHY** : Vascular endothelium, the concepts of pulsatility, blood shear stress, hemodynamics and their clinical implications

- **Anti-Inflammatory Mechanisms in The Vascular Wall**
Un Tedgui, Z Mallat • *Circ Res.* 2001 May 11 ; 88(9) :877-87 • DOI: 10.1161/hh0901.090440
- **Molecular basis of the effects of shear stress on vascular endothelial cells**
Yi-Shuan J Li, Jason H Hagg, Shu Chien • Molecular basis of the effects of shear stress on vascular endothelial cells; *J Biomech.* 2005 Oct; 38(10):1949-71 • DOI: 10.1016/j.biomech.2004.09.030
- **Endothelium and inflammation**
Thomas Trepels, Andreas M Zeilher, Stephan Fichtlscherer • The endothelium and inflammation ; *Endothelium.* 2006 Nov-Dec; 13(6):423-9 • DOI: 10.1080/10623320601061862
- **Vascular Endothelium Summary Statement I: Health Promotion and Chronic Disease Prevention**
W. Craig Hoopera, John D Catravas, Donald D Heistad, William C Sessa, George A Mensah • *Vascul Pharmacol.* 2007 May ; 46(5):315-7 • DOI: 10.1016/j.vph.2006.10.014
- **The endothelium: a new organ**
H. Ait-Oufella, E. MAury, B. Guidet, G. Offenstadt • *Réanimation* (2008) • Vol 17, 126-136 • DOI: 10.1016/j.reaurg.2007.12.005
- **Activité physique : contexte et effets sur la Santé**
Physical activity: context and effects on health
Analyse – III – 12 ; fonction endothéliale et régulation rhéologique - *Institut national de la santé et de la recherche médicale (France), Pôle Expertise collective Paris : INSERM, DL 2008*
ISBN 978-2-855598-862-4 / ISBN 978-2-855598-863-2
- **Hemodynamic shear stress and the endothelium in cardiovascular patho- physiology**
Peter F Davies • *Nat Clin Pract Cardiovasc Med.* 2009 Jan; 6(1) :16-26 • DOI: 10.1038/ncpcardio1397
- **Effects of the shear stress on endothelial cells : go with the flow**
D A Chistiakov, A N Orekhov, Y V Bobryshev • *Acta Physiol. (Oxf).* 2017 Feb; 2019(2):382-408 • DOI: 10.1111/apha.12725
- **Mitochondrial and metabolic adaptations to exercise-Induced fluid shear stress in endothelial cells**
Hong, Soan-Gook, Shin, Junchul, Aldokhayyil, Maitha, Brown, Michael David, Park, Joan-Young • *Exercise and Sport Sciences Reviews.* July 2022 – Volume 50 – Issue 3 : 145-155 / DOI: 10.1249/JES.0000000000000289

06. BIBLIOGRAPHY : Vascular endothelium and nitric oxide

- **Shear stress-induced release of nitric oxide from endothelial cells grown on beads**
G M Bugg, M E Gold, J M Fukuto, L J Ignarro • Hypertension. 1991 Feb ; 17(2) : 187-93 • DOI: 10.1161/01.hyp.17.2.187
- **Endothelial dysfunction in human disease**
H Drexler, B Hornig • J Mol Cell Cardiol. 1999 Jan; 31(1):51-60 / DOI: 10.1006 imcc.1998.0843
- **Nitric oxide and repair of skeletal muscle injury**
Lidiane Isabel Filippin, Andrea Janz Moreira, Norma Possa Marroni, Ricardo Machado Xavier • Nitric Oxide. 2009 Dec; 21(3-4):157-163 / DOI: 10.1016/j.niox.2009.08.002
- **Nitric oxide regulates the repair of injured skeletal muscle**
Lidiane Isabel Filippin, Maria José Cuevas, Elena Lima, Norma Possa Marroni, Javier Gonzalez-Gallego, Ricardo Machado Xavier • Nitric Oxide. 2011 Jan 1; 24(1):43-9 • DOI: 10.1016/j.niox.2009.11.003
- **Nitric oxide and endothelial dysfunction**
Anthony R Cyr, Lauren V Huckaby, Sruti S Shiva, Brian S Zuckerbraun • Crit Care Clin. 2020 Apr ; 36(2):307-321 • DOI: 10.1016/j.ccc.2019.12.009

07. BIBLIOGRAPHY : Endothelial dysfunction and associated pathologies

ENDOTHELIAL DYSFUNCTION AND ENDOMETRIOSIS

- **Mechanisms of endometriosis-associated pain: new insights.**
Taylor RN, Yu J, Torres PB, et al. *Trends Endocrinol Metab.* 2008;19(7):285–293 / DOI : 10.1016/j.tem.2008.03.007
- **Endometriosis.**
Giudice LC. *N Engl J Med.* 2010;362:2389–2398 / DOI : 10.1056/NEJMra0911005
- **Endothelial dysfunction (...) in young European women with endometriosis.**
Santoro L, D’Onofrio F, Campo S, Ferraro PM, Tondi P, Campo V, Flex A, Gasbarrini A, Santoliquido A. *Hum Reprod.* 2012;27(5):1320–1326 / DOI: 10.1093/humrep/des062
- **Microvascular alterations in women with endometriosis : a pilot study exploring endothelial dysfunction and chronic inflammation.**
Younes G, et al. *Sci Rep.* 2024;14:8993 / DOI: 10.1038/s41598-024-73841-7

ENDOTHELIAL DYSFUNCTION AND RHEUMATOID ARTHRITIS (RA)

- **Explaining how “high-grade” systemic inflammation accelerates vascular risk in rheumatoid arthritis.**
Sattar N, McCarey DW, Capell H, McInnes IB. *Circulation.* 2003;108(24):2957–2963 / DOI : 10.1161/01.CIR.0000099844.31524.05
- **Endothelial dysfunction in systemic autoimmune diseases: prevalence and mechanisms.**
Gonzalez-Juanatey C, Llorca J, Testa A, Revuelta J, Garcia-Porrúa C, Gonzalez-Gay MA. *Curr Rheumatol Rep.* 2005;7(6):451–455 / DOI : 10.1007/s11926-005-0058-0

OTHER PATHOLOGIES LINKED TO ENDOTHELIAL DYSFUNCTION

- **Endothelial function and dysfunction: testing and clinical relevance.**
Deanfield JE, Halcox JP, Rabelink TJ. *Circulation.* 2007;115(10):1285–1295 / DOI : 10.1161/CIRCULATIONAHA.106.652859
- **Endothelial Cell Dysfunction and the Pathobiology of Atherosclerosis.**
Gimbrone MA, García-Cardena G. *Circ Res.* 2016;118(4):620–636 / DOI : 10.1161/CIRCRESAHA.115.306301

08. BIBLIOGRAPHY : Lymphatic endothelium

● Lymphatic endothelium, review

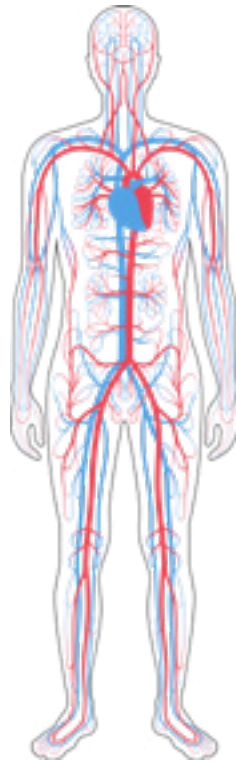
Angelika Chachai, Andrzej Szuba • Postepy Biochem. 2013; 59(4) : 379-85 / PMID : 24745168

● Mecanobiology of lymphatic cells

Lance L Munn • Semin Cell Dev Biol. 2015 Feb; 38 : 67-74 / DOI : 10.1016/j.semcd.2015.01.010

01.

Pulsatile, centripetal, cardio-synchronized mechanical stimulation is produced from the ankles to the abdomen.



02.

The fluid flows are activated in a general way, throughout the body and in all the networks .

03.

Stimulation of the flux generates mechanotransduction towards the endothelial cells. (shear stress effect)

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