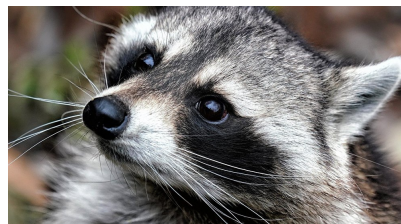


Hyperbaric medicine research in Switzerland: an « à la Prévert » inventory.

Buehlmann Memorial Symposium

March 29. 2019

Dr Marc-Alain Panchard



Une pierre
deux maisons
trois ruines
quatre fossoyeurs
un jardin
des fleurs

un raton laveur

Roadmap

Research

- Fundamental
- Clinical
- Engineering

Publications

- Papers
- Books
- Flyers

During the last ~ 5 - 10 years

Congresses

- Presentations
- Posters

Other

Method

- Mail survey sent to SUHMS members
- Pubmed (2011 → now). Diving OR Hyperbaric AND
 - Names of Medical examiner of divers in Switzerland
 - N. of Diving physicians in Switzerland
 - N. of Hyperbaric physician in Switzerland
 - Switzerland
 - N. of SUHMS's members



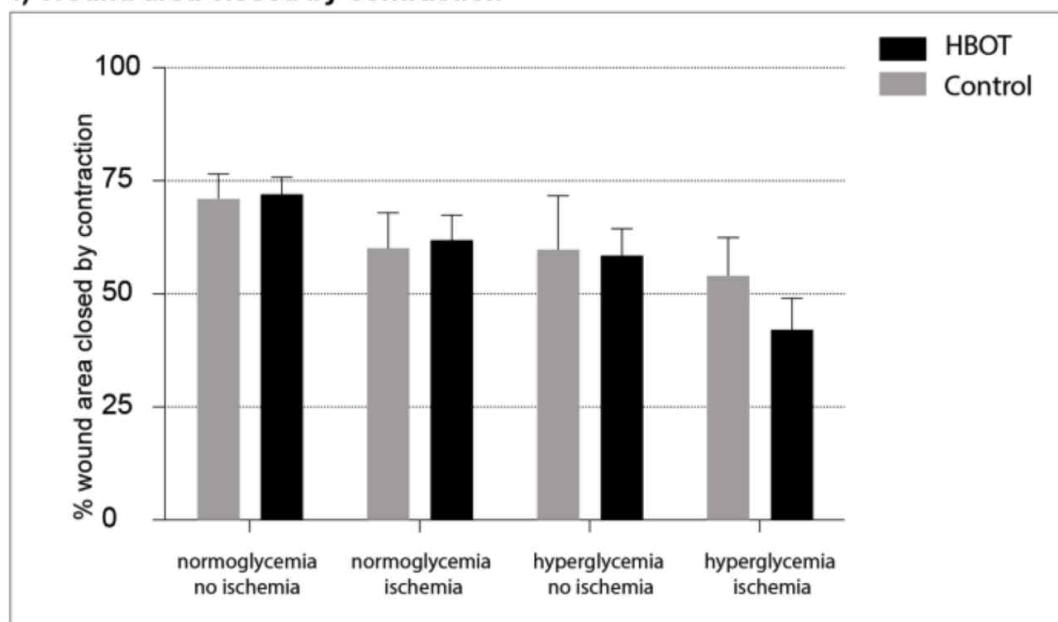
Apologize for any missed contribution!!!

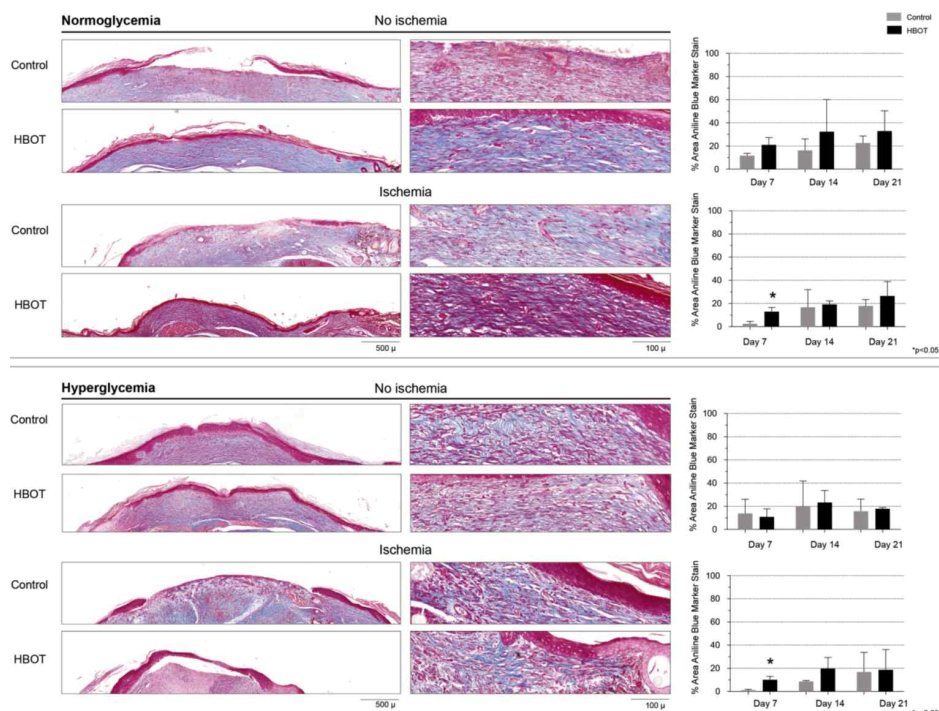
Research: fundamental

- ▶ Andre-Lavigne D, Pignel R et al: Wound healing under HBO conditions in rats. Published.
- ▶ Pittet-Cuenod B, Pignel R et al: Hyperbaric Oxygen Therapy and NOX projects
- ▶ Preynat-Seauve O, Brembilla N: Effects of HBO on maturation of stem cells in a wound healing sponge device



f) Wound area closed by contraction





Research: clinical

- ▶ Thaler J, Pignel R, Louge P: Retrospective study of DCS treated in Geneva's hyperbaric center (in progress)
- ▶ Gelsomino M and Neurology department of Basel University Hospital: HBO 3 months after ischemic cerebral vascular accident, feasibility study
- ▶ Pignel R, Magnan MA: SOS gelures, HBO treatment for severe frostbites (in progress)
- ▶ Louge P, Pignel R: Validation of a sham HBOT (in progress)

Research: clinical Louge P, Pignel R: Validation of a sham HBOT (in progress)

	Benefits	Risks
Low depth Air	Barotrauma low	Blinding uncertain
Equivalent depth Adjusted P_iO_2	Blinding good	Barotrauma Deco Technical ($F_iO_2 < 21\%$)
Equivalent depth Air	Blinding good	Barotrauma Deco +++ $P_iO_2 > 21\%$ ($\Rightarrow O_2$ suppl)

Adapted from Louge P, communication to come

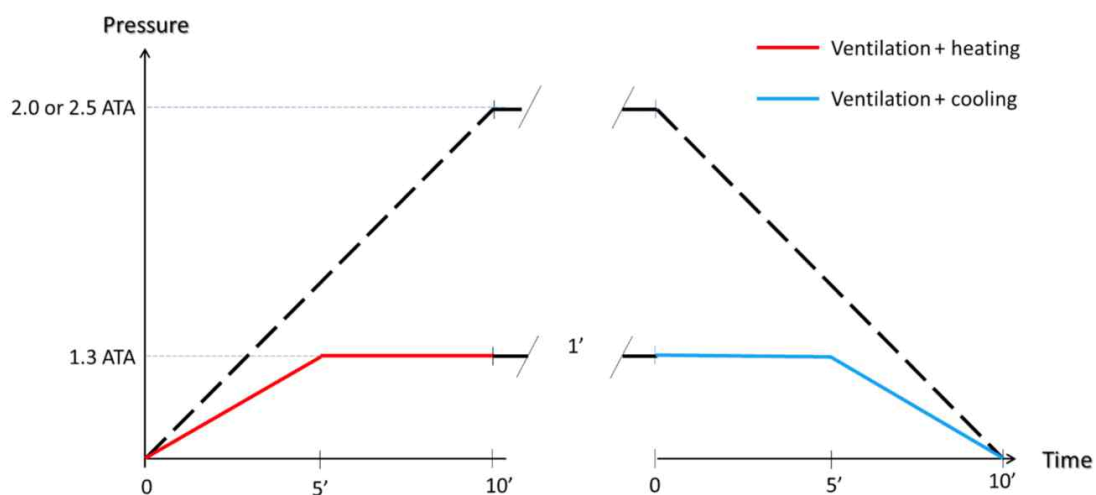


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Research: clinical Louge P, Pignel R: Validation of a sham HBOT (in progress)



Adapted from Louge P, communication to come



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Research: clinical

- ▶ Stirnemann J, Pignel R et al: Double blind RCT of HBOT in sickle cell crisis in patients over 8 y.o. (in progress)
- ▶ Hendier I, Pignel R, Pittet D Evaluation of infection risk during HBO sessions
- ▶ Boet S, Louge P, Magnan MA, Louge P, Pellegrini M, Pignel R, Bennett M. Systematic review: The effectiveness of preventive hyperbaric oxygen therapy to optimize surgical outcome: a systematic review of randomized controlled trials

Research: engineering

Nitrogen dosimeter

- ▶ Aim: monitoring real time N₂ status in hyperbaric chamber staff to avoid any risk of decompression sickness

Discussion

While respecting the operative pressurization instructions, thanks to the "dosimeter", inside hyperbaric attendants know throughout their working day, their residual level of nitrogen and helium, and the time necessary for almost complete desaturation.

This device is easy to use and will avoid desaturation accidents and increase safety and comfort of staff of hyperbaric medicine centres.



Research: engineering

- ▶ Pignel R et al: Study of effects of pressure (hyper and hypo) on dose metered Salbutamol inhaler
- ▶ Pignel R et al: Study on function of 3 ventilators in hyperbaric conditions
- ▶ Pignel R et al: Adaptations of emergency technics and material to deep hyperbaric conditions

CRÉATION D'UN SYSTÈME DE VENTILATION DE SECOURS ADAPTÉ AU CAISSON HYPERBARE
Dr R. Pignel*, Mr. P. Avrillon*, Mr. M. Parceiro*
*Consultation de Médecine & Thérapie Hyperbare HUG

Définition
BAVU : Ballon Auto-remplisseur à Valve Unidirectionnelle ou "insufflateur manuel" est conçu pour suppléer à la respiration d'un patient en arrêt respiratoire. Le système de valves unidirectionnelles permet de fournir une ventilation sans apport de gaz comprimé. Le BAVU peut être relié à un masque, ou à une sonde d'intubation endo-trachéale.

Buts
Apporter le gaz défini par la table et continuer la séance normalement en cas de panne de respirateur
Conserver la possibilité de changer de gaz respiratoire conformément à la table
Éviter la pollution de l'air ambiant par une expiration dans la chambre

Principe
Conserver un circuit respiratoire étanche

Le branchement se fait sur le circuit patient (masque), par un raccordement (TUYAU ANNELÉ) entre « l'entrée » de la chambre et l'embout inspiratoire du BAVU (raccord réducteur 4022 en laiton spécialement usiné) d'une part, et par un raccordement depuis la valve expiratoire de la valve unidirectionnelle du BAVU vers la « sortie » de la chambre (raccord standard malemale 22mm droit ou coudé 90°)

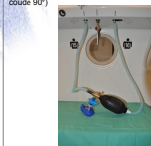
A la pression du ballon, le gaz contenu est expulsé vers le patient. Lors du relâchement du ballon, la dépression relative actionne le détendeur de la chambre ce qui remplit le ballon. L'expiration du patient s'effectue via la valve unidirectionnelle vers le diviseur de la chambre. Un filtre bactérien est mis entre le masque ou la sonde d'intubation et la valve unidirectionnelle

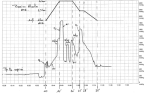
Matériel
Le BAVU « Combi bag MW 11020 » de Weinmann est utilisé car facilement adaptable, stérilisable et polyvalent (adulte, enfant)

Les résultats sont satisfaisants.
Les pressions partielles d'oxygène expire sont normales par rapport aux gaz utilisés et aux différentes pressions. Il est décidé de mettre ce système en fonctionnement au CMTH de Genève

Intérêt
Ce système est moins lourd à l'utilisation et surtout beaucoup moins onéreux (400 CHF) que celui proposé dans le commerce (5000€) !

Consultation de Médecine & Thérapie Hyperbare





Publications: papers

- ▶ Pasquier M, Dami F, Carron PN, Yersin B, Pignel R, Hugli O. Mass casualty triage in the case of carbon monoxide poisoning: lessons learned. Disaster Med Public Health Prep 2018 Jun;12(3):373-378
- ▶ Castagna O,... Louge P,... Mac Iver. The key roles of negative pressure, breathing an exercise in the development of interstitial pulmonary edema in professional male scuba divers. Sport Med Open 2018; 4:1-12
- ▶ Marlinge M,... Guieu R, Louge P. Troponins in scuba divers with immersion pulmonary edema. Biosc reports 2018;38:1-6
- ▶ Blatteau JA,... Louge P,... Vallée N. Reduction of the level of plasma mitochondrial DNA in human diving followed by an increase in events of accident. Frontiers physiol 2018;9.
- ▶ Desgraz B, Sartori C, Saubade M, Héritier F, Gabus V. L'œdème pulmonaire d'immersion. Rev Med Suisse 2017, Jul 12;13(569):1324-1328
- ▶ Gempp E, Liard M, Louge P. Reliability of right to left shunt screening in the prevention of scuba diving related decompression sickness. Int J Cardiol 2017;248:155-158

Publications: papers

- Steffensmeier D, Albrecht R, Wendling J, Meilinger R, Spahn DR, Stein P, Wyss C. Specialist advice may improve patient selection for decompression therapy following diving accidents: a retrospective observational study. Scand J Trauma Resusc Emerg Med 2017 Oct 19;25(1):101

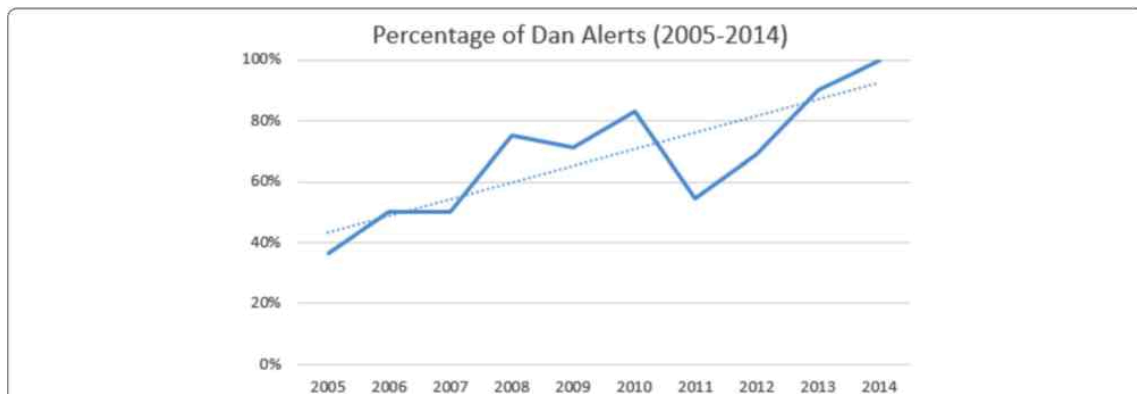


Fig. 2 Percentage of DAN alerts over time. Significant increase of DAN contact in the case of a diving accident treated by the Swiss HEMS Rega



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Publications: papers

- Steffensmeier D, Albrecht R, Wendling J, Meilinger R, Spahn DR, Stein P, Wyss C. Specialist advice may improve patient selection for decompression therapy following diving accidents: a retrospective observational study. Scand J Trauma Resusc Emerg Med 2017 Oct 19;25(1):101
- Gelsomino M, Tsouras T, Millar I, Fock A. A pleural vacuum relief device for pleural drain unit use in the hyperbaric environment. Diving Hyper Med 2017 Sep;47(3):191-197
- Panchard MA. Plongée chez l'enfant et l'adolescent. Mise à jour au travers de quelques cas concrets. Paediatrica 2016, 27(3): 19-23
- Niyibizi E, Kembi GE, Lae C, Pignel R, Sologashvili T. Delayed hyperbaric oxygen therapy for air emboli after open heart surgery: case report and review of a success story. J Cardiothorac Surg 2016 Dec 5;11(1):16



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Publications: papers

- › André-Lévigne D, Mordarressi A, Pignel R, Bochaton-Piallat ML, Pittet-Cuénod B. Hyperbaric oxygen therapy promotes wound repair in ischemic and hyperglycemic conditions, increasing tissue perfusion and collagen deposition. *Wound Repair Regen* 2016 Nov;24(6):954-965
- › Damnon F, de Rahm M, Baud D. Should a pregnancy test be required before scuba diving. *Br J Sports Med* 2016 Sep;50(18):1159-60
- › Jüttner B, Wölfel C et al. Diagnosis and treatment of diving accidents. New German guidelines for diving accidents 2014-2017. *Anaesthesist* 2015 Jun;64(6):463-8.
- › Kamtchum Tatuane J, Pignel R, Pollak P, Lovblad KO, Kleinschmidt A, Vargas MI. Neuroimaging of diving related decompression illness: current knowledge and perspectives. *Am J Neuroradiol* 2014 Nov-Dec; 35(11):2039-44
- › Willemin T, Dos Santos Bragabça A, Ziltener JL, Berney JY, Lanier C. Medical certification for high altitude travel and scuba diving. *Rev Med Suisse* 2014 Sep 24;10(443):1772-8
- › Abosaleh M, Pignel R, Boehncke WH. Hyperbare Sauerstofftherapie bei therapierefraktärem Pyoderma gangrenosum. *Akt Dermatol* 2014;40.24-26

Publications: papers

- › Zanotta C, Dagassan-Berndt D, Nussberger P, Waltimo T, Filippi A. Barodontalgias, dental and orofacial barotraumas: a survey in Swiss divers and caisson workers. *Swiss Dent J*, 2014;124(5):510-19
- › Héritier F, Avanzi P, Nicod L. Lungs and diving. *Rev Med Suisse* 2014 Nov 19;10(451):2182-6, 2188-9
- › Héritier F. The lung and diving. *Rev Med Suisse* 2013 Jan 30;9(371):235
- › Michel F. The lung and diving. *Rev Med Suisse* 2013 Jan 30;9(371):249
- › Wendling J. Diving - fitness to dive: a challenge for the family doctor. *Praxis (Bern 1994)* 2013 Jun 19;102(13):791-8
- › Mutzbauer TS, Staps E. How delay to recompression influences treatment and outcome in recreational divers with mild to moderate neurological decompression sickness in a remote setting. *Diving Hyperb Med*, 2013 Mar;43(1):42-45
- › Mutzbauer TS, Neubauer, Tetzlaff K. Different reactions of human nasal and Eustachian tube mucosa after hyperbaric oxygen exposure: a pilot study. *Eur Arch Otorhinolaryngol* 2013 Mar;270(4):1249-53

Publications: papers

- › Billinger M, Schwerzmann M, Rutishauser W, Wahl A, Windecker S, Meier B, Seiler C. Patent foramen ovale screening by ear oximeter in divers. *Am J Cardiol* 2013 Jan 15;112(2):286-90
- › Doll SX, Rigamonti F, Roffi M, Noble S. Scuba diving, acute left anterior descending artery occlusion and normal ECG. *BMJ Case Rep* 2013 Jan 32;2013
- › Lefebvre JC and al. Bench testing of a new hyperbaric chamber ventilator at different atmospheric pressures. *Intensive Care Med*. 2012 aug ;38(8)
- › Wölfel C, Schöpfer G, Konrad C, Knessl P, Wendling J. Telemedicine in the management of diving accidents: correlation of phone-assessed symptoms severity with clinical findings. *Diving Hyperb Med* 2011 Dec;41(4): 189-94
- › Frossard JL, Braude P, Berney JY. Computed tomography imaging of pneumatosis intestinal after hyperbaric oxygen therapy: a case report. *J Med Case Rep* 2011 Aug 15;5:375

Publications: papers in press

- › Guieu R,.... Louge P,... Joulia F: Physiological stress markers during breath-hold diving and scuba diving. Physiological reports
- › Hendier L, Abbas M, Pittet D, Pignel R: Evaluation of bacterial survival in hyperbaric environment, DHM
- › Louge P, Pignel R: Hyperoxic additional longue tables use in scuba divers with neurological decompression sickness: Experience of the hyperbaric centre of Geneva University Hospital, DHM
- › Magnan MA, Pignel R: Case report of frostbites, *Wilderness journal*
- › Thaler J, Pignel R, Louge P: DCS in Geneva hyperbaric centre between 2010-2017, DHM
- › Boet S, Louge P, Magnan MA, Louge P, Pellegrini M, Pignel R, Bennett M. Systematic review: The effectiveness of preventive hyperbaric oxygen therapy to optimize surgical outcome: a systematic review of randomized controlled trials. *Anesthesiology*.

Publications: books

- ▶ Louge P. Les accidents de plongée. Traité de médecine d'urgence. Lapostole F. Ed Lavoisier, Paris 2019
- ▶ Louge P. Hypertension artérielle et plongée. Coeur et plongée. Lafay V. Ed Ellipse, Paris 2018
- ▶ Louge P. Accidents de plongée. Réanimation, le traité de référence. Offenstadt G. Ed Elsevier-Masson. Paris 2017
- ▶ M. Coulange, E. Blatteau, O. Le Penetier, F. Joulia, P. Constantin, A. Desplantes, A. Henckes, V. Lafay, A. Kauert, R. Pignel, B. Barberon, P. Louge, A. Barthélémy. Accidents en plongée subaquatique et en milieu hyperbare, Encyclopédie Médico-Chirurgicale, Médecine d'urgence [25-030-G-20] 2015 - Doi : 10.1016/S1959-5182(15)65303-XR.
- ▶ Pignel R. Chapter « Plaies, cicatrisation et OHB » du manuel « Soins de plaies : comprendre, prévenir et soigner » SAFW, section Romande, ed. Médecine et Hygiène
- ▶ M Pellegrini, P Avrillon. Chapter « Le MEOPA pour les douleurs procédurales, les soins de plaie » SAFW, section Romande, ed. Médecine et Hygiène
- ▶ M Pellegrini, B Yersin, Intoxication au monoxyde de carbone, traité de médecine d'urgence pré-hospitalière, Edition Médecine et Hygiène, 2012

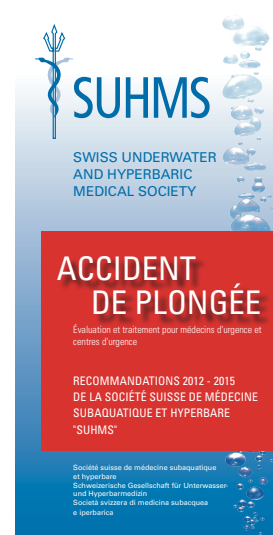
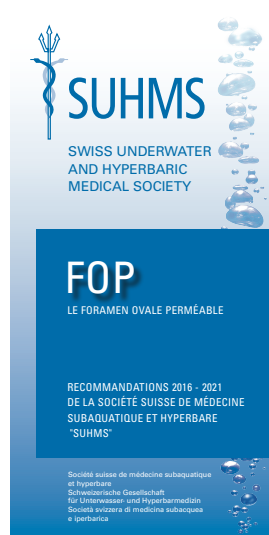
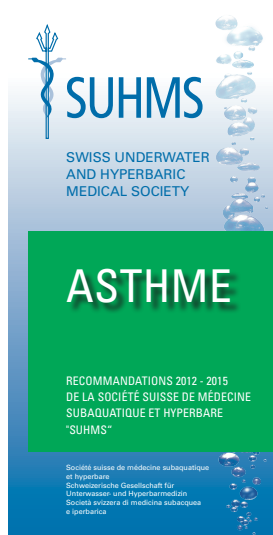
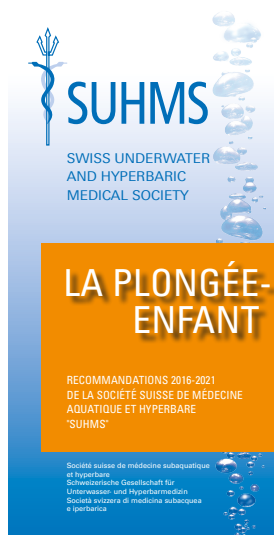


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Publications: flyers



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Congresses: posters

EUBS 44th Congress, Durban 2018 (1)

- ▶ M. Pellegrini, MA Magnan, C. Laé, P Louge, MA Panchard, R Pignel: Oxygen partial pressures under hyperbaric conditions in a child with congenital heart disease presenting with right to left shunt.
- ▶ Pellegrini M, Magnan MA, Laé C, Louge P, Panchard MA, Pignel R: Usefulness of HBOT to heal critical wound in pediatric heart disease
- ▶ Magnan MA, Pignel R: Severe hand frost bite treated by HBOT.
- ▶ Louge P, Pignel R: The Use of hyperoxic additional long tables in scuba divers with neurological DCS: Geneva experience.
- ▶ Louge P, Gempp E, Magnan MA, Pellegrini M, Pignel R. An unusual case of sinus barotrauma: a case of orbital surgical emphysema with genesis of frontal sinus bone.

Congresses: posters

EUBS 44th Congress, Durban 2018 (2)

- ▶ Pignel R, Pellegrini M: A new hyperbaric pump
- ▶ Pignel R, Louge P: A nitrogen dosimeter

NEW HYPERBARIC PUMP
R. Pignel⁽¹⁾, M. Pellegrini⁽¹⁾, M. Gelsomino⁽²⁾

Introduction
Since the society Fresenius[®] stopped the production of syringe driver « Pilot », there is no more hyperbaric infusion pump in the market. In 2015, Arcomed[®] company proposed to test two types of infusion pump (VolumePV77000 and SyringeSP56000) in hyperbaric conditions.

Material and methods:
Arcomed[®] provided us 6 devices (three of them with Patient Control Analogue). All the devices were prepared for hyperbaric conditions by the engineering unit of the company. All the tests were made in three hyperbaric chambers. We tested all the devices at HBOT maximum depth (4 ATA) and deep commercial dive depth (10.1 or 12 ATA). It was made operational (normal running) and performance (reliability) tests. In the reliability tests we operated with low and high flow.

Results:
The 6 devices worked perfectly well at 4 ATA. They delivered exactly the quantity and the flow requested. It was the same for the 3 syringe pumps at 10.1 ATA. However, the infusion pump VolumePV77000 might delivered 5 to 10% more in high pressure. The PCA mode performed well at any time.

Discussion
After many tests between 4 to 10.1 ATA, the Hyperbaric syringe driver SyringeSP56000 of Arcomed[®] stay reliable and efficient in normal mode and PCA mode. The infusion pump VolumePV77000 stay reliable at 4 ATA but it must be used with care for higher pressures. Since the tests, the 3 devices obtain the hyperbaric CE mark.

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HBO

(1) Hyperbaric centre, Emergency Unit, Geneva University Hospital, Switzerland
(2) Hyperbaric Centre, Basel, Switzerland

Congresses: posters

EUBS 43th Congress, Ravenna 2017

- Blatteau GE, Gempp E, De Maistre S, Druelle A, Louge P, Pontier JM, Castagna O: Ascent emergency training and pulmonary barotrauma in training military divers
- Gempp E, Prévautel T, Pény C, Louge P: Immersion pulmonary edema with rebreather among french military divers from 2009 to 2015: role of hydrostatic imbalance

Congresses: posters

EUBS 42th Congress, Geneva 2016

- Foglia A, Camponovo C: Planning a Health (Hyperbaric) Center in Ticino (Southern Switzerland).
- Panchard MA, Schild B: Trying to formalize recommendations about children's scuba diving. The swiss way to the holy graal.
- Panchard MA: First introductive dive in children: how to improve access and security?
- Ponti A, Hajdu S, Maillard M, Schmidt S, Pignel R: Successful treatment of pneumatosis cystoides intestinalis by hyperbaric oxygen therapy (HBOT): a case report.
- Magnan M, Spagnoli P, Pignel R, CO poisoning in Geneva in 2015

Congresses: posters

EUBS 42th Congress, Geneva 2016

- ▶ Fourquet N, Parceiro M, Pignel R: Safety rules during hyperbaric treatment.
- ▶ Favre D, Avrillon P, Fourquet N, Magnan M, Pignel R: How computing helps evaluate the treatment of chronic wounds.
- ▶ Abdelali A, Pignel R, Magnan M: Survey concerning health care for CO poisoning at the Skikda Ward, Algeria.

Congresses: posters

EUBS 40th Congress, Wiesbaden 2014

- ▶ Pignel R, Rey N, Richard JC: Mechanical ventilation in the hyperbaric centers: European survey

MedSubHyp, Lyon, 2018

- ▶ Pignel R. Le dosimètre à nitrogène.

Other

- ▶ Pastor D, Alberto C, Louge P, Erdmann A, Toutous-Trellu L. Livedoid vasculopathy successfully treated with hyperbaric oxygen therapy

Congresses: presentations

EUBS 42th Congress, Genève 2016

- ▶ Levigne D, Modarressi A, Pignel R, Bochaton-Piallat M, Pittet-Cuenod B
Hyperbaric oxygen therapy promotes wound closure and perfusion in ischemic and hyperglycemic conditions, independently of myofibroblast differentiation
- ▶ Bussienne F, Pignel R, Bendjelid K, Giraud R, Cardiogenic shock related to carbon monoxide poisoning
- ▶ Niyibizi E, Kembi G, Lae C, Pignel R, Sologashvili T, Delayed hyperbaric oxygen therapy for air emboli after open heart surgery: report and review of a success story

Congresses: presentations

EUBS 39th Congress, St-Gilles-les-Bains 2013

- ▶ Mattiuzzo M, François O, Combescure C, Bonnabry P, Fonzo-Christe C, Pignel R Influence of hyperbaric pressures on Salbutamol metered dose inhaler performances
- ▶ Lévigne D. Modarressi A. Pignel R. Atashi F. Pittet-Cuénod B, hyperbaric oxygen therapy: what type of wound benefits most?

Congresses: presentations

EUBS 44th Congress, Durban 2018

- Magnan MA, Pignel R: International Frostbite Registry IFR.

SPUMS Congress, Bali 2017

- Pignel R: Hyperbaric physicians at 12 ATA

ICHM Congress, Belgrade 2017

- Magnan MA, frostbite and HBOT



Other

ECHM consensus conference, Lille, 2016

- Berney JY, Gelsomino M, Laé C, Pellegrini M, Pignel R, Wendling J

Consensus Conference

Tenth European Consensus Conference on Hyperbaric Medicine:
recommendations for accepted and non-accepted clinical indications
and practice of hyperbaric oxygen treatment

Daniel Mathieu, Alessandro Marroni and Jacek Kot

Diving and Hyperbaric Medicine Volume 47 No. 1 March 2017

Other

Table 2

Recommendations on the indications accepted for HBOT (there was no Level A evidence)

Condition	Level of evidence		Agreement level
	B	C	
Type 1			
CO poisoning	X		Strong agreement
Open fractures with crush injury	X		Strong agreement
Prevention of osteoradionecrosis after dental extraction	X		Strong agreement
Osteoradionecrosis (mandible)	X		Strong agreement
Soft tissue radionecrosis (cystitis, proctitis)	X		Strong agreement
Decompression illness		X	Strong agreement
Gas embolism		X	Strong agreement
Anaerobic or mixed bacterial infections		X	Strong agreement
Sudden deafness	X		Strong agreement
Type 2			
Diabetic foot lesions	X		Strong agreement
Femoral head necrosis	X		Strong agreement
Compromised skin grafts and musculo-cutaneous flaps		X	Strong agreement
Central retinal artery occlusion (CRAO)		X	Strong agreement



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Other

Crush Injury without fracture	X	Agreement
Osteoradionecrosis (bones other than mandible)	X	Agreement
Radio-induced lesions of soft tissues (other than cystitis and proctitis)	X	Agreement
Surgery and implant in irradiated tissue (preventive treatment)	X	Agreement
Ischaemic ulcers	X	Agreement
Refractory chronic osteomyelitis	X	Agreement
Burns, 2nd degree more than 20% BSA	X	Agreement
Pneumatosis cystoides intestinalis	X	Agreement
Neuroblastoma, stage IV	X	Agreement
Type 3		
Brain injury (acute and chronic TBI, chronic stroke, post anoxic encephalopathy) in highly selected patients	X	Agreement
Radio-induced lesions of larynx	X	Agreement
Radio-induced lesions of the CNS	X	Agreement
Post-vascular procedure reperfusion syndrome	X	Agreement
Limb replantation	X	Agreement
Selected non-healing wounds secondary to systemic processes	X	Agreement
Sickle cell disease	X	Agreement
Interstitial cystitis	X	Agreement



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et une nuits trente-deux positions six parties du monde cinq points
cardinaux dix ans de bons et loyaux services sept péchés capitaux
deux doigts de la main dix gouttes avant chaque repas trente jours
de prison dont quinze de cellule cinq minutes d'entracte

et...

plusieurs ratons laveurs.



Jacques Prévert, Paroles, 1946

?

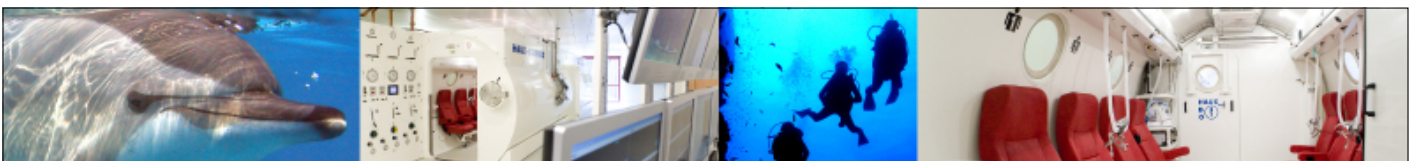
Conclusions

Research in hyperbaric and diving medicine in Switzerland is fruitful.

Switzerland is present on the international scene in hyperbaric and diving medicine.

Hyperbaric medicine gets more and more recognized by other medical specialities.

Swiss researchers are humble,...



Thank you for your attention