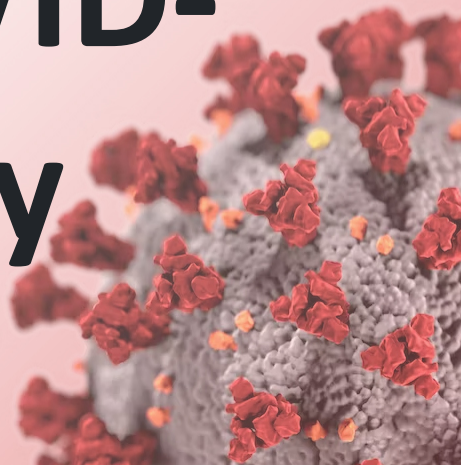
FLCCC ALLIANCE
EDUCATIONAL CONFERENCE 2022

UNDERSTANDING & TREATING
SPIKE PROTEIN-INDUCED DISEASES

October 14-16, 2022 • Orlando, Florida

A practical guide to hyperbaric oxygen therapy in COVID-19 and COVID-19 Vaccine Injury



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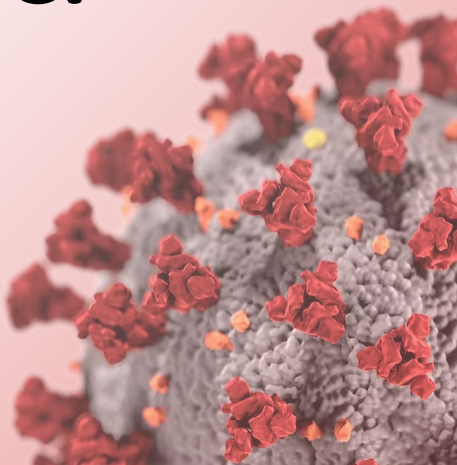
October 14-16, 2022 • Orlando, Florida

PAUL G. HARCH, M.D.
HARCH HYPERBARICS, INC.
WWW.HBOT.COM



---------- Forwarded message ---------
From: **YouTube Community Guidelines** <no-reply@youtube.com>
Date: Fri, Oct 14, 2022 at 2:50 PM
Subject: YouTube removed your content
To: <harchhbot-3352@pages.plusgoogle.com>

YouTube

Hi HarchHBOT,

Our team has reviewed your content, and, unfortunately, we think it violates our **medical misinformation policy**. We've removed the following content from YouTube:

Video: Hyperbaric Oxygen Therapy and COVID-19, Acute Infection, Long-Hauler's Syndrome, and Vaccine Injury

We know that this might be disappointing, but it's important to us that YouTube is a safe place for all. If content breaks our rules, we remove it. If you think we've made a mistake, you can appeal and we'll take another look. Keep reading for more details.

How your content violated the policy

YouTube doesn't allow content that poses a serious risk of egregious harm by spreading medical misinformation about currently administered vaccines that are approved and confirmed to be safe and effective by local health authorities and by the World Health Organization (WHO). Learn more here.

WHAT

IS

HYPERBARIC OXYGEN THERAPY?

Functional Definition of Hyperbaric Oxygen Therapy

A dual-component drug treatment that uses increased pressure and increased pressure of oxygen to treat disease pathophysiology

HBOT in Global Ischemia, Anoxia, and Coma. Chapter 18.
Textbook of Hyperbaric Med., K.K. Jain (Ed.), 1999

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HBOT in the U.S.

1. Air or Gas Embolism — Acute Wd
2. CO Poisoning/Smoke Inhalation — Acute Wd
3. Crush Injury, Compartment Syndrome, and other acute Traumatic Ischemias — Acute Wd
4. Decompression Sickness — Acute Wd
5. Selected Problem Wounds (diabetic, arterial insufficiency, venous stasis, etc.) — Chronic Wd
6. Exceptional Blood Loss (Anemia) — Acute Wd
7. Radiation Tissue Damage (Osteoradionecrosis and Soft Tissue) — Chronic Wd

UHMS HBOT Committee Report, 2014

HBOT in the U.S.

8. Skin Grafts and Flaps (Compromised)	Acute Wd
9. Thermal Burns	Acute Wd
10. Central Retinal Artery Occlusion	Acute Wd
11. ISSHL (Sudden hearing loss)	Acute/Subacute Wd
12. Clostridial Myonecrosis (gas gangrene)	Acute Wd
13. Necrotizing Soft Tissue Infections (Flesh-eating Bacteria)	Acute Wd
14. Osteomyelitis (Refractory) or (Acute) in Compromised Hosts (Bone Infections)	Chronic, Acute Wd
15. Intracranial Abscess (Brain)	Acute Wd

UHMS HBOT Committee Report, 2014

HBOT internationally

Russia: 70 diseases[1]

China: 49 diseases[1]

Japan: 33 diseases[1]

U.S: 15 diseases[1]

Gabb/Robin article: 132 diseases[2]

- Vast majority are wounding and inflammatory conditions
- **My experience: 90-100 different conditions, 80% of which are neurological.**

1. Textbook of Hyperbaric Medicine, 5th and 6th Editions, K.K. Jain, editor. Springer, Switzerland, 2009, 2017.

2. Gabb G. Chest. 1987;92(6):1074-82.

Clinical Applications of HBOT

The pathophysiology in Wounding conditions.

HBOT is a treatment for wounds in any location and of any duration

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What is the Mechanism of Action in Wounding Conditions?

- Primarily, Gene Signaling

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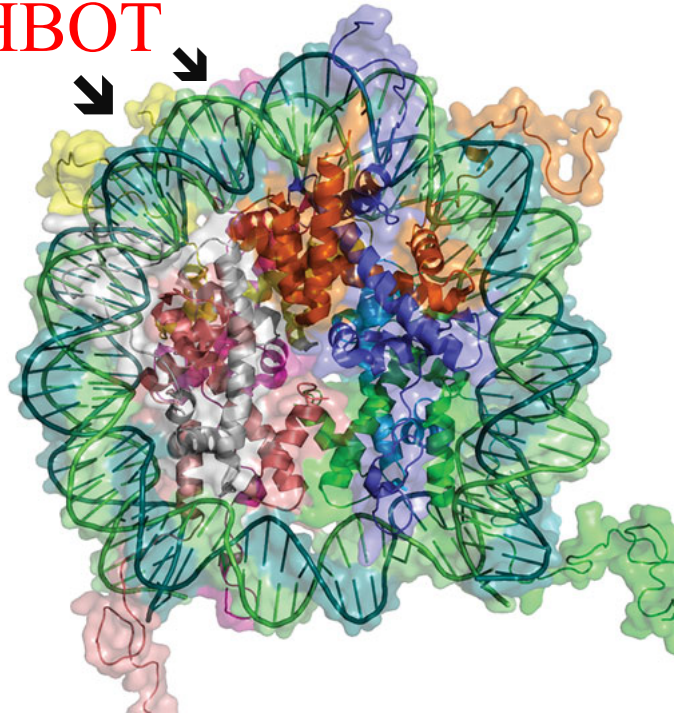
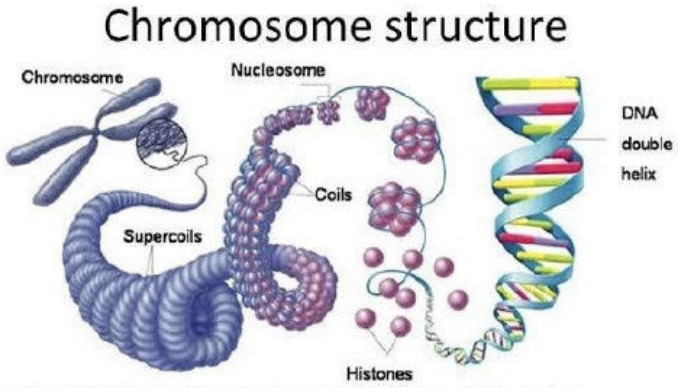
HBOT and Epigenetic Effects

DNA coil with histone protein interior.

HBOT





Strands of DNA wrap around a protein (**histone**) forming **nucleosomes.**
Nucleosomes coil together forming **chromatin.**
Chromatin loops and coils together forming **supercoils.**
Supercoils bunch together forming **chromsomes.**

https://www.facebook.com/108014754067239/photos/a.110468583821856/111089703759744/

http://www.genengnews.com/gen-articles/awaken-dormant-dna-epigenetically/5818

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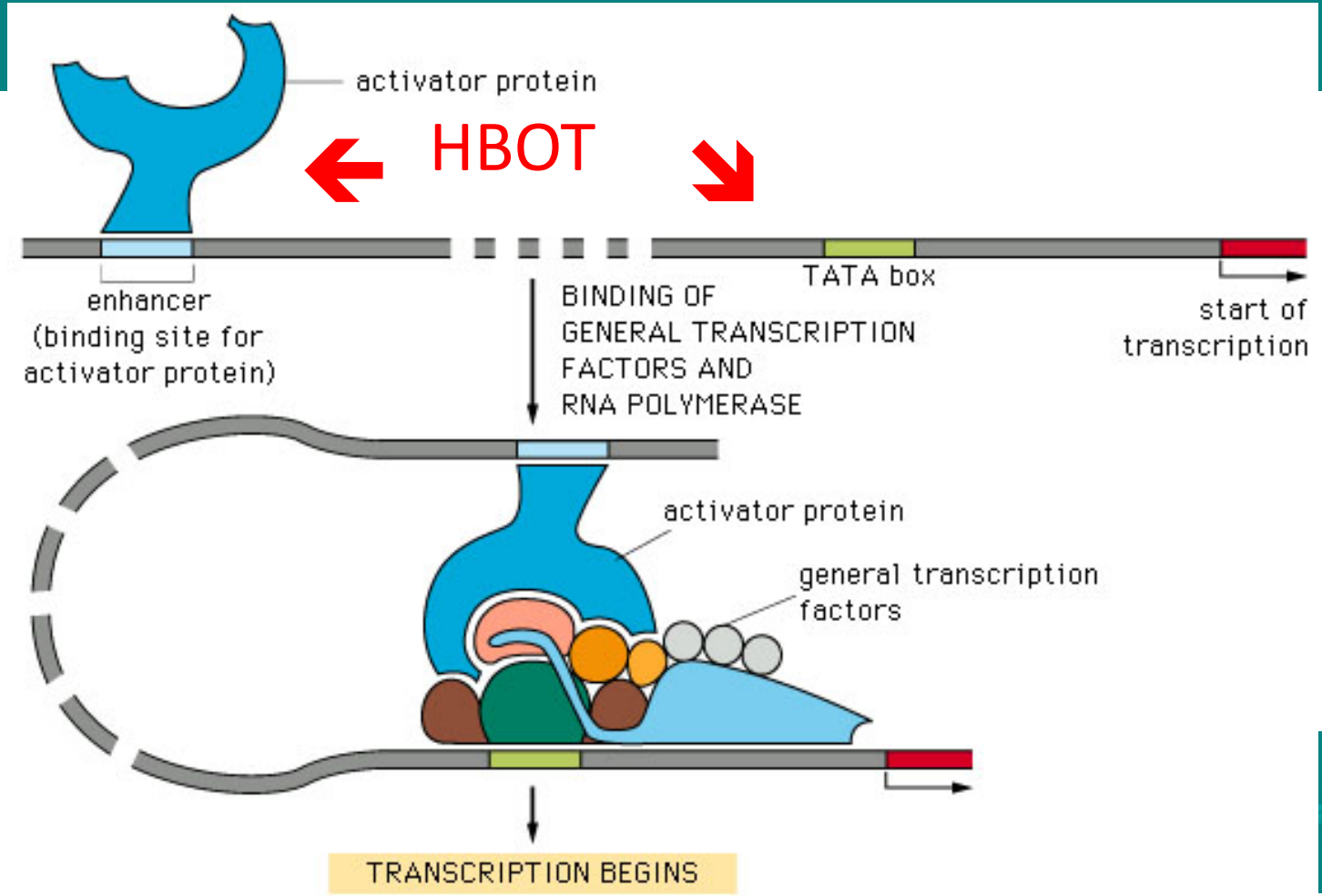

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HBOT and Gene Effects in Normal Human Cells

Godman CA. Cell Stress and Chaperones, DOI 10.1007/s12192-009-0159-0 (Courtesy Dr. Philip James)

Human microvascular endothelial cells, in vitro
1st HBOT: 2.4 ATA/60 mins.

2nd HBOT at 24h

Results:

1. At 24h 8,101 of >19,000 protein-coding genes up or down regulated compared to control
2. Genes upregulated: anti-inflammatory and growth/repair hormones
3. Genes downregulated: pro-inflammatory and cell death.

At 48h:

1. Cells formed microtubules (blood vessels) in a petri dish

These effects are in normal non-diseased tissue: demonstrates normal human sensitivity to changes in environmental pressure and oxygen levels

What about the effects of increased barometric pressure?

Since the 1940s there are dozens of articles on the physiologic/biologic effects of pressure, including micropressure, on normal cells across the entire phylogenetic spectrum.

MICROPRESSURES OF 1.0015-1.3 ATA

Comparative Biochemistry and Physiology Part A 122 (1999) 13–36

Review

The transduction of very small hydrostatic pressures

A.G. Macdonald [a,*], P.J. Fraser [b]

[a] *Department of Biomedical Sciences, Zoology Building, Tillydrone Avenue, University of Aberdeen, Aberdeen AB24 2TZ, Scotland, UK*
[b] *Department of Zoology, Tillydrone Avenue, University of Aberdeen, Aberdeen AB24 2TZ, Scotland, UK*

Received 17 July 1998; accepted 23 November 1998

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HBOT-HBA-pressure,oxygen,genes: Normal cells

Normal rat cortical neurons: different pressure conditions for 1h, followed by 2h incubation

B. Number of differentially expressed genes

Δ expression	Cell Treatments						
	2HBA	4HBA	6HBA	NBO	2HBO	4HBO	6HBO
≥ 1.5 fold increase	27	26	28	25	22	25	16
≥ 1.5 fold decrease	136	137	116	50	12	4	8
Total	163	163	144	75	34	29	24

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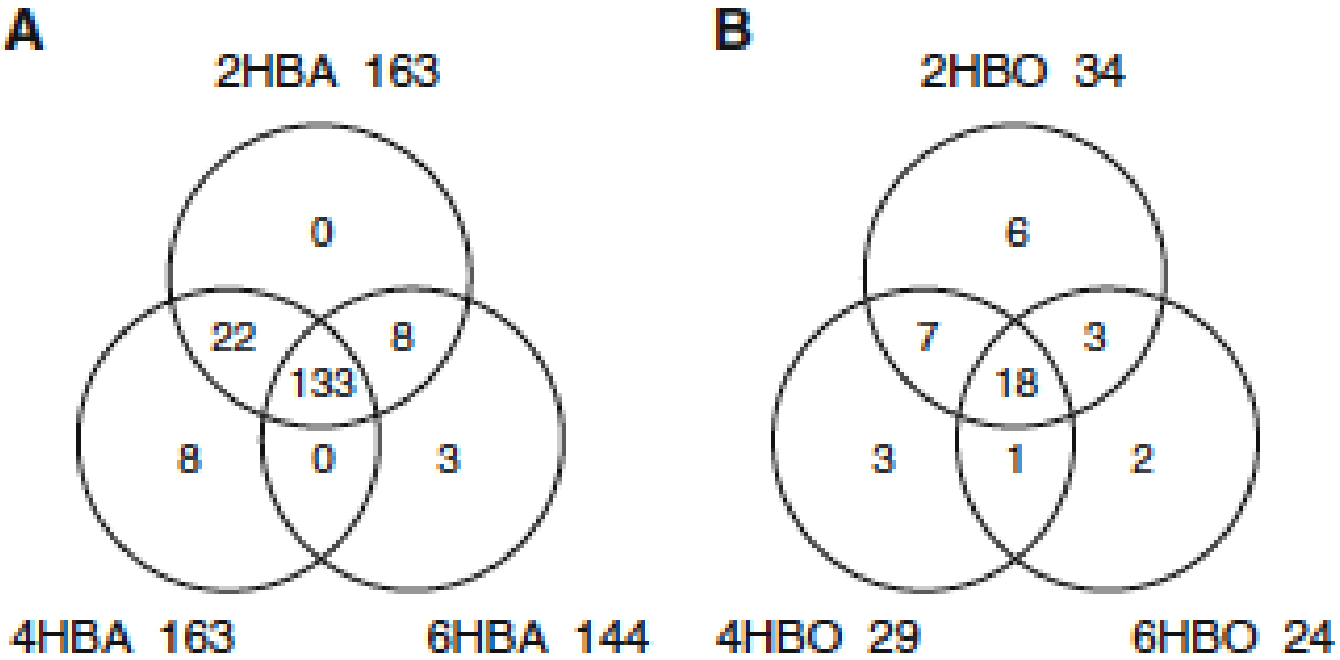
Chen, Y. Neurochem Res, 2009;34:1047-1056

HBOT-HBA-pressure,oxygen,genes



Pressure downregulates (>80% of genes),
oxygen upregulates (>64% of genes)

Chen, Y. Neurochem Res, 2009;34:1047-1056

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Primary mechanism of action of HBOT?

Modulation of gene expression and suppression in both normal cells and disease states.

(A 360 year old epigenetic therapy)

What are the most common wound pathophysiologies in disease states?

- Ischemia
- Hypoxia
- Inflammation

HBOT Evidence for treatment of disease pathophysiology (inflammation)

Literature Reviews

1. **The Role of Hyperbaric Oxygen Treatment for COVID-19: A Review**

Matteo Paganini, Gerardo Bosco, Filippo A. G. Perozzo, Eva Kohlscheen, Regina Sonda, Franco Bassetto, Giacomo Garetto, Enrico M. Camporesi, and Stephen R. Thom

Adv Exp Med Biol - Clinical and Experimental Biomedicine (2021) 11: 27–35
https://doi.org/10.1007/5584_2020_568
© Springer Nature Switzerland AG 2020
Published online: 22 July 2020

2. UHM 2021, VOL. 48 NO. 1 – HYPERBARIC OXYGEN AND COVID-19

REVIEW ARTICLE

Physiologic and biochemical rationale for treating COVID-19 patients with hyperbaric oxygen

Co-Chairs, Research Committee: John J. Feldmeier, DO [1], John P. Kirby, MD [2], Jay C. Buckey, MD [3]

3. **The role of hyperbaric oxygen therapy in inflammatory bowel disease: a narrative review**

Xin Wu[a], Tian-Yu Liang[a], Zhong Wang[*], Gang Chen
Department of Neurosurgery & Brain and Nerve Research Laboratory, the First Affiliated Hospital of Soochow University, Suzhou, Jiangsu Province, China

Med Gas Res. 2021;11(2):66-71. doi: 10.4103/2045-9912.311497.

4. Medical Hypotheses 144 (2020) 110224

Contents lists available at ScienceDirect

Medical Hypotheses

journal homepage: www.elsevier.com/locate/mehy

Can hyperbaric oxygen safely serve as an anti-inflammatory treatment for COVID-19?

Anders Kjellberg[a,b,*,1], Antonio De Maio[c,d], Peter Lindholm[a,e]

5. REVIEW Open Access

Hyperbaric oxygen treatment in autism spectrum disorders

Daniel A Rossignol[1*], James J Bradstreet[2,3], Kyle Van Dyke[4], Cindy Schneider[5], Stuart H Freedenfeld[6], Nancy O'Hara[7], Stephanie Cave[8], Julie A Buckley[9], Elizabeth A Mumper[10] and Richard E Frye[11]

Rossignol *et al. Medical Gas Research* 2012, **2**:16
http://www.medicalgasresearch.com/content/2/1/16

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HBOT Evidence for treatment of inflammation

6.

Rossignol *Medical Gas Research* 2012, 2:6
http://www.medicalgasresearch.com/content/2/1/6

MEDICAL GAS RESEARCH

REVIEW Open Access

Hyperbaric oxygen treatment for inflammatory bowel disease: a systematic review and analysis

Daniel A Rossignol

"HBOT has been shown to possess potent anti-inflammatory properties in both animal (55,67,68) and human (10,11,20,46,69) studies and has been reported to decrease the production of pro-inflammatory cytokines….in both animal (66,70) and human (20,49) studies as well as increase IL-10 levels (71)."

HBOT Evidence for treatment of inflammation

7.

Review Article
TheScientificWorldJOURNAL (2006) 6, 425–441
ISSN 1537-744X; DOI 10.1100/tsw.2006.78

TheScientificWorldJOURNAL
www.thescientificworld.com

Effects of Hyperbaric Oxygen on Inflammatory Response to Wound and Trauma: Possible Mechanism of Action

Noori S. Al-Waili* and Glenn J. Butler
Life Support Technologies, Inc. – New Technologies, Inc., Chronic Wound Treatment and Hyperbaric Medicine Center, The Mount Vernon Hospital, 7th Avenue 12 North, Mount Vernon, NY 10550

"HBO_2 has important effects on the biology of cytokines and other mediators of inflammation. HBO_2 causes cytokine down-regulation and growth factor upregulation, transiently suppresses stimulus-induced proinflammatory cytokine production, affects the liberation of endothelins, and reduces TNF alpha, PGE2, and COX-2 mRNA

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HBOT Evidence for treatment of ARDS

Literature Reviews

1. RCT: Severely burned patients, HBOT vs. no HBOT. Subset of Vent/ARDS patients:
   Results: 20 HBOT/10 on vent with ARDS
   8 Control/5 on vent with ARDS
   No deleterious effect of HBOT, even in those on continuous high levels of inspired O_2.
   More rapid weaning from mechanical ventilation in HBOT group:
   5.3d vs. 26d ($p<0.05$).[1]

2. Prospective case series, all HBOT patients on mechanical ventilation (150) at a single HBOT site: 35 with ARDS (Berlin Definition).

   Results: 23% mortality in ARDS patients vs. 11-87% in ARDS literature review (all causes ARDS).

1. Ray CS. Undersea Biomed Res, 1991;18(Suppl):77. 2. Bessereau J. Int Marit Health, 2017;68(1):46-51.

HBOT Evidence for treatment of ARDS

Literature Reviews

3. Retrospective controlled series blunt thoracic trauma
   - 45 patients: 26 developed ARDS w/i 48-72h of trauma
     - PaO_2/FiO_2 < 250.
     - 8/26 received HBOT within 24-48h of trauma,
     - 18/26 standard supportive care.
     - HBOT: 1.6-2.0 ATA/40-60 mins. for 4-15 treatments.
   - Results:
     - Mortality: HBOT: 0%
       Control: 77%.

3. Rogatsky GG. ARDS in Patients after blunt thoracic trauma: the influence of hyperbaric oxygen therapy, Chapter 12, Adv Exp Med Biol, Oxygen Transport to Tissue XXV, ed. Thorniley, Harrison, James.Kluwer Academic/Plenum Publishers, 2003.

Science of COVID-19 Infection and Application of Hyperbaric Oxygen

1. Acute COVID Pathology/Pathophysiology: Autopsies[1,2,3]
   a. Inflammation and exudate in the lungs.
   b. Systemic inflammation.
   C. thrombogenesis.
   D. Oxygen Debt
2. Long Hauler's Syndrome: :
   A. Inflammation
3. COVID Vaccine Injury
   A. Inflammation

1. Xu Z, et al. www.thelancet.com/respiratory Published online February 17, 2020 https://doi.org/10.1016/S2213-2600(20)30076-X 1
2. Hanley B, et al. J Clin Pathol 2020;0:1–4. doi:10.1136/jclinpath-2020-206522
3. Tian S, et al. Modern Pathology. https://doi.org/10.1038/s41379-020-0536-x

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Hyperbaric oxygen therapy (HBOT) for acute COVID-19 infection

- “History bears remembering”

- Internet posting on HBOT.com,
- March 10, 2020

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HBOT: COVID-19

https://www.theguardian.com/world/2020/mar/01/gunnison-colorado-the-town-that-dodged-the-1918-spanish-flu-pandemic

Spanish Flu Pandemic 1918: 1/3rd of world population Infected, 2.5% mortality rate, ~50 mill. deaths world-wide.

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HBOT: COVID-19

Cunningham's Spanish Flu Treatment:
Kansas City, Kansas
Hyperbaric Air Treatment

- "The youth's lips were blue-black and he was deeply unconscious. Cunningham let the pressure build up…and held it there…Of a sudden the patient stirred. The lad's eyes were open, he was turning pink; he was out of his coma…Cunningham continued that treatment for little over an hour. Then intermittently during the next three days he gave the patient additional dives…the pneumonia victim starting to recover…a few days later another moribund pneumonia patient…and Cunningham saved a life."

Trimble VH. The Uncertain Miracle, Hyperbaric Oxygenation, Doubleday and Company, Inc., Garden City, NY, 1974, p. 57

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HBOT: COVID-19

Dr. Orval Cunningham's Spanish Flu Treatment:
Kansas City, Kansas
Hyperbaric Air Treatment

THE
LARYNGOSCOPE.

VOL. LXXIV MAY, 1964 No. 5

THE FALLIBILITY OF THE FORRESTIAN PRINCIPLE.*†

"Semper Primus Pervenio Maxima Cum Vi."

LYLE M. SELLERS, M.D.,
Dallas, Tex.

Crude, wooden, shelf-like bunks were installed hurriedly in the latter compartment, and Dr. Cunningham's work began. Only moribund patients were brought to the tank, and here miracles were worked before our eyes. Patients whose lips bore the blue-black livid stamp of the kiss of death and who were deeply unconscious, but if not too far beyond the brink, in a matter of minutes were brought back to a normal color and to a return to consciousness. Very shortly a larger tank was supplied and numbers of such patients were restored to life and health.

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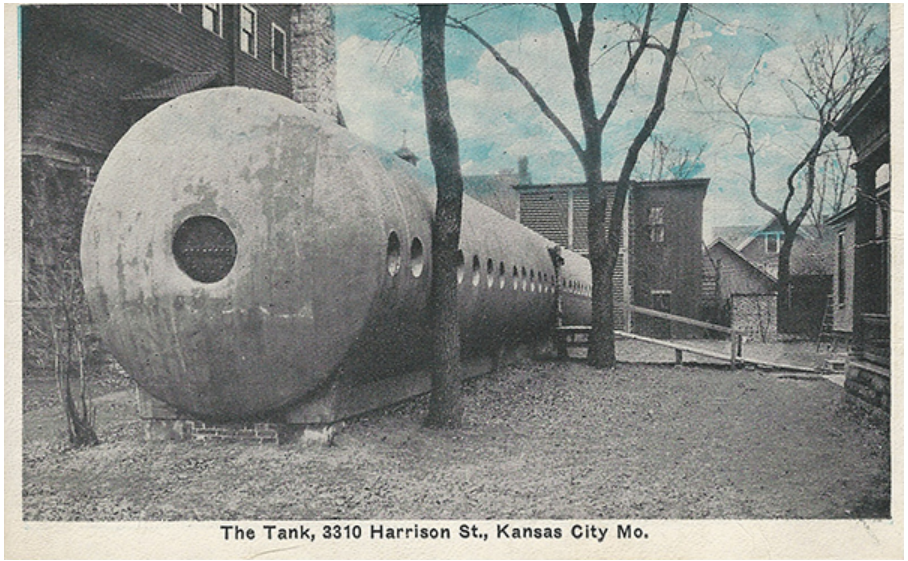
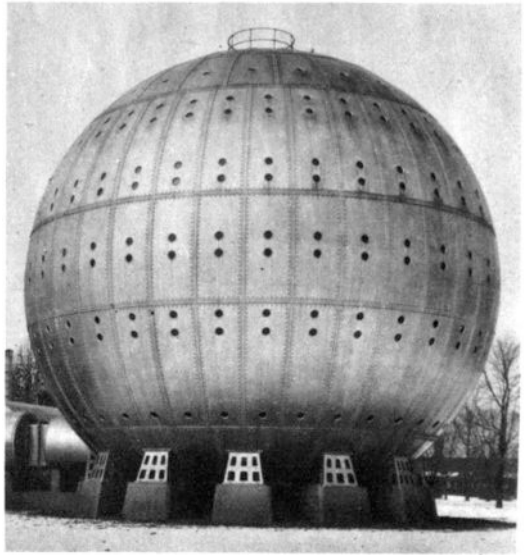
HBOT: COVID-19



http://midtownkcpost.com/why-was-there-a-huge-steel-tank-at-33rd-and-harrison-in-the-1920s/



Cleveland, Ohio

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HBOT: COVID-19

Dr. Cunningham's Dose of HBOT:

- 1.68 ATA air (.35 ATA oxygen)/1 hour, ~5 daily treatments
- 1 ATA = sealevel pressure

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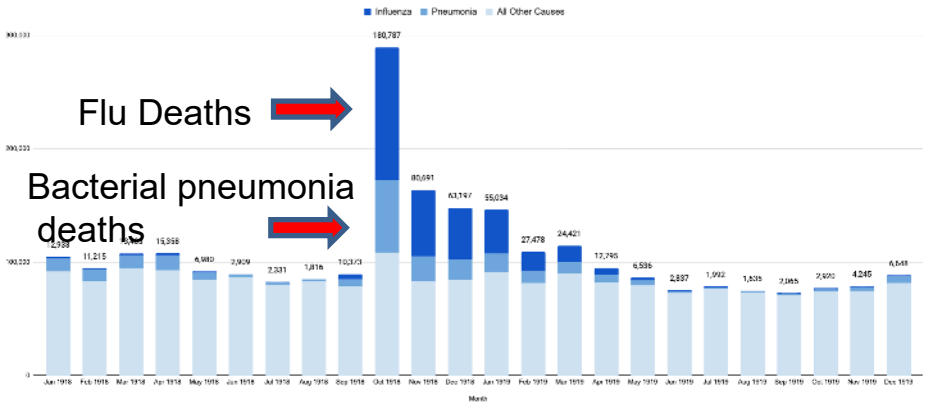
HBOT: COVID-19

Mortality in Spanish Flu 1918 and 1919: due to the flu itself and secondary bacterial pneumonia



"Measuring Mortality In The Pandemics Of 1918–19 And 2020–21,
" Health Affairs Blog,April 1, 2021.DOI: 10.1377/hblog20210329.51293

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HBOT: COVID-19

- Similarity between Spanish flu and Covid-19:

  both are RNA respiratory viruses

- Mortality primarily due to lung infection:
- ARDS and bacterial pneumonia in Spanish Flu and ARDS in COVID

  ARDS in Spanish Flu: 100% mortality

  ARDS in COVID-19: 53.4% mortality.[1]

Since antibiotics were not discovered until 1928 (Fleming) and HBOT has no antibiotic effect except on anaerobic bacteria at high oxygen pressures, HBOT was not treating the bacterial pneumonia

Cunningham had to be treating ARDS in Spanish Flu patients

1. Liang ST, et al. COVID-19: a comparison to the 1918 influenza and how we can defeat it. Postgrad Med J. 2021;0:1-3. doi:10.1136/postgradmedj-2020-139070

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HBOT: COVID-19

- January-March, 2020: Numerous discussions with hyperbaric nurse/wife regarding HBOT potential in COVID-19 infection.
- March 10, 2020: Post “History bears remembering.”
- March 11, 2020: Juliette Harch finds Chinese article from Wuhan, China on the internet: report on 5 COVID patients treated with HBOT.
- March 19, 2020: Phone call with Dr. Xiaoling Zhong thru a translator.
  - 35 patients treated, no further infectious cases, no further treatment of COVID w/HBOT.
  - Excited communication about the effects of “pressure.” Related what happened when mask came off during compression or while at depth.
- March 19-28, 2020: Worked with Chinese authors to assist in publication of their paper. Had been rejected by two journals and soon a third. Disagreements over pressure and importance of Cunningham experience.
- Chinese authors submit to Chinese journals.

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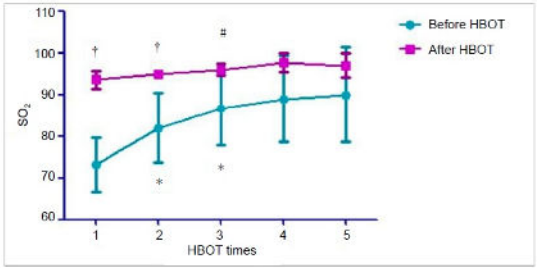
HBOT Covid-19 protocols :

- Formal announcement of Wuhan COVID-19 and Spanish Flu HBOT experience:



Hyperbaric oxygen treatment of novel coronavirus (COVID-19) respiratory failure p. 61

Paul G Harch

DOI:10.4103/2045-9912.282177 **PMID**:32541128

Effects of HBOT (pressure and oxygen) on ARDS and inflammation

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Literature Review: Hbot in Covid-19

1. Review article:
   - a. Zhong, X-L: case report, vent patient (above). 1.6 ATA/100, qd x 4.
   - b. Chen R: 5 case series (above). 2.0 ATA/90 then 2.0/60, qd 1st patient; 1.6 ATA/90 then 1.6/60 qd for 2nd-5th patients.
   - c. Liang Y. Case Report. ≥ 2.0 ATA/95 mins daily x ?. Contradictory conclusions.
   - d. Guo D. 2 case reports. (see below). 1.5 ATA (95% O2)/60 x 7
   - E. Thibodeaux K. Retrospective case series (See below). 2.0 ATA/90 at depth, avg. 5 HBOTs
   - F. Levina oA. 32 patients, "moderately severe" and "Serious" (below). 1.4 ATA/30, then 1.6/40-60 ATA/90, total 4-6 HBOTs.
   - g. Gorenstein SA. Treated cases vs. matched controls. (below). 2.0 ATA/90, qd, upto 5 HBOTs.
   - H. Petrikov SS. Controlled study, 87 pts., 1.4-1.6 ATA/40 mins, "HBOT Increases the effectiveness of treatment, decrease malondialdehyde." Can't retrieve.
2. Samoilov SS. 34 patients, 5 severities based on CT lung damage. ? Dose, # treatments. Findings: significant improvement in pulse ox after HBOT in the 3 more severe groups.
3. Cannellotto M. 40 patients, RCT, 1.45/90 qd, x ≥ 5 HBOTs. Trial stopped at interim analysis due to benefit in HBOT group (spO2 normalization 3d vs. 9d control group).

1. Oliaei S. Eur J Med Res, 2021;26:96. 2-12.

HBOT in COVID-19 Infection-Summary

Varying designs and quality of studies

Varying doses of hyperbaric oxygen therapy, however, consistent positive results

HBOT has no known anti-viral COVID effect.

Therefore, HBOT is likely treating the inflammatory component of acute COVID-19

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What about Long-Haulers' Syndrome


nature medicine

FOCUS | REVIEW ARTICLE

https://doi.org/10.1038/s41591-021-01283-z

Check for updates

Post-acute COVID-19 syndrome

Ani Nalbandian[1,24], Kartik Sehgal[2,3,4,24] ✉, Aakriti Gupta[1,5,6], Mahesh V. Madhavan[1,5],

Post-acute COVID-19 syndrome (Long-Haulers' Syndrome): a syndrome characterized by persistent symptoms and/or delayed or long-term complications beyond 4 weeks from the onset of symptoms.

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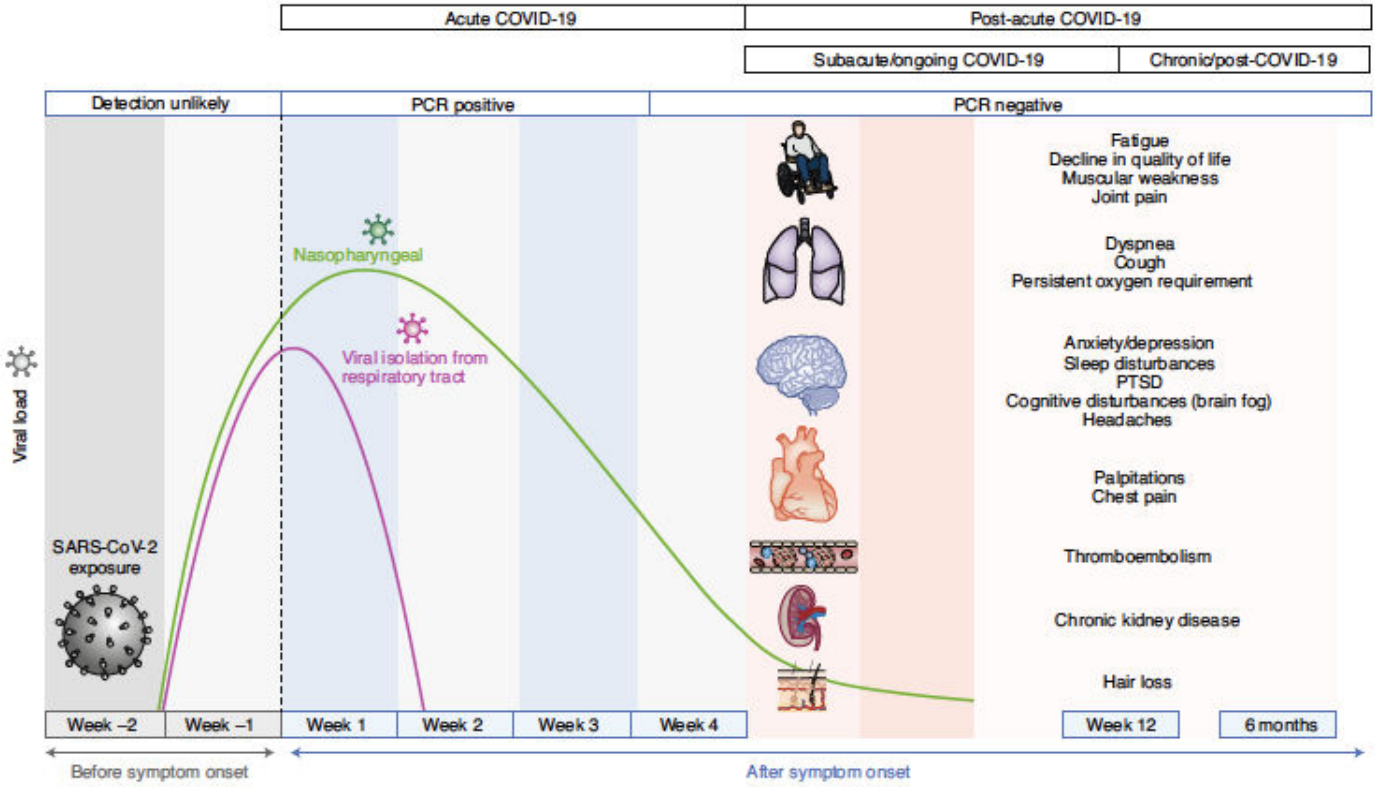
Long-Haulers' Syndrome



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Long-Haulers' Syndrome

- Symptoms: 80% infected with COVID develop 1 or more of 55 LT Sx:
  - Fatigue: 58%
  - Headache: 44%
  - Attention Disorder: 27%
  - Hair Loss: 25%
  - Dyspnea: 24%
  - Memory Loss: 16%

More Than 50 **Long**-Term Effects of **COVID-19**: A Systematic Review and Meta-Analysis.Lopez-Leon S, Wegman-Ostrosky T, Perelman C, Sepulveda R, Rebolledo P, Cuapio A, Villapol S.Res Sq. 2021 Mar 1:rs.3.rs-266574. doi: 10.21203/rs.3.rs-266574/v1. Preprint.

Long-Haulers' Syndrome

- Pathophysiology:
  - Virus-specific pathophysiologic changes
  - Immunologic and inflammatory damage
  - Post-intensive care syndrome: microvascular ischemia/injury, immobility, metabolic alterations

HBOT in Long-Haulers' Syndrome and COVID Vaccine Injury: Case Report

- 50 y.o. female, COVID-19 infection/Sx x 10d: HA, chills, fatigue, myalgias, LBP, sweats, brain fog.
- Since infection: continuous brain fog, confusion, memory loss, HA, vision impairment, CP, irritability.
- Post infection: viral tests negative x 2, positive COVID antibodies.
- Sx worse with any physical or cognitive activity.
- HBOT 27d post infection: 1.5 ATA O_2/45 mins. TDT, once daily x 13
- "90% back to normal, can't believe it."

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HBOT in Long-Haulers' Syndrome and COVID Vaccine Injury: Case Report

- 2 more HBOTs, stressful incidents x 2, deterioration.
- Further improvement, gets COVID vaccine, marked deterioration 2d later: all COVID Sx return.
- Flies out of town, further deterioration.
- Valtrex-oral herpes expression, decadron, IV infusions, ER visit.
- 14d post 15th HBOT: HBOT at 1.4 ATA/90 mins. 50% O_2-Florida
- 15d post 15th HBOT: HBOT at 1.5 ATA/60 mins. O_2-Florida. Not improved.
- Returns New Orleans, HBOT 1.5 ATA/45 x 6: improved.

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HBOT-Long-Haulers-Case Series

Hyperbaric oxygen therapy for the treatment of long COVID: early evaluation of a highly promising intervention

Authors: Tim Robbins,[A] Michael Gonevski,[B] Cain Clark,[C] Sudhanshu Baitule,[D] Kavi Sharma,[E] Angel Magar,[F] Kiran Patel,[G] Sailesh Sankar,[H] Ioannis Kyrou,[I] Asad Ali[J] and Harpal S Randeva[K]

10 patient with post-COVID fatigue of at least 12 weeks duration (avg. > 3 mos.)

2.4 ATA/105 mins., once/day, 5d/week x 10

Chalder fatigue scale pre/post and NeuroTrax cognitive testing

p values, Cohen's d (small .2, med .5, large .8, v. large 1.2), Bayes Factor: probability of alternate vs. null hypothesis: anec. (1-3), mod (3-10), strong (10-30), v. strong (30-100), extreme (>100).

Clinical Medicine 2021 Vol 21, No 6: e629–32

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HBOT-Long-Haulers-Case Series

RESULTS:

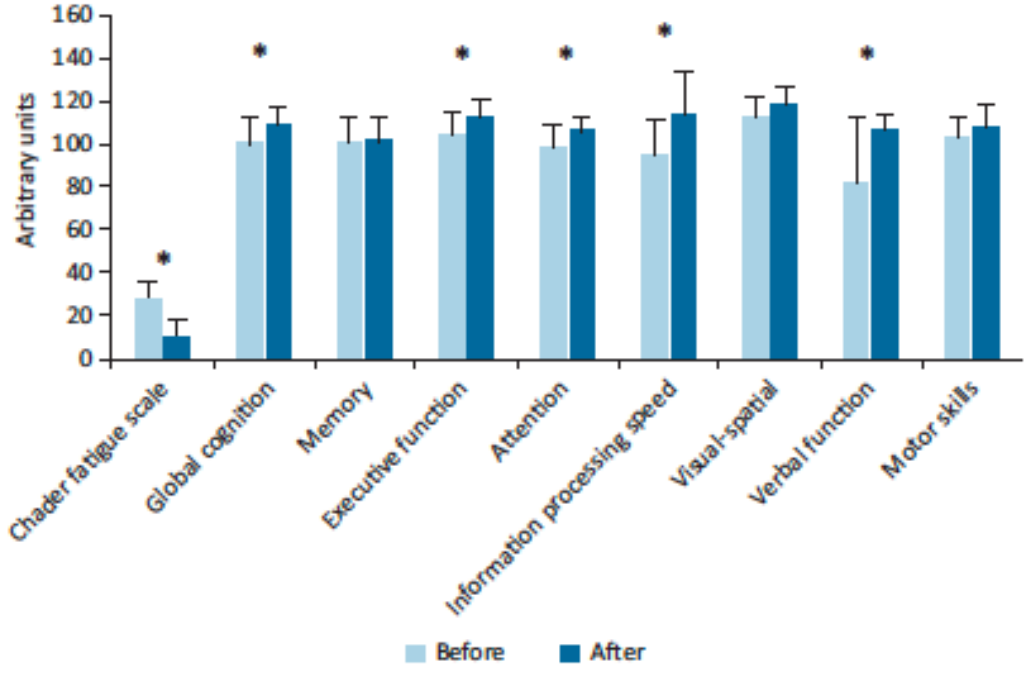

Fig 1. Scores between day 1 (before) and day 10 (after) of hyperbaric oxygen therapy. *significant difference; arbitrary units are construct specific.

Clinical Medicine 2021 Vol 21, No 6: e629–32

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HBOT-Long-Haulers-Case Series

RESULTS:

Table 2. Day 1 vs day 10 of hyperbaric oxygen therapy

	p value	Mean difference (95% CI)	Cohen's d	BF
Global cognition	0.0137[a]	–8.4 (–14.55 – –2.9)	–1.07	7.626
Memory	0.8457	0.9 (–10.6–7)	–0.01	0.3091
Executive function	0.0039[a]	–7.3 (–12.65 – –2.2)	–1.06	7.3286
Attention	0.0020[a]	–7 (–12.45 – –2.05)	–1.2	12.5093
IPS	0.0059[a]	–15.3 (–29.8 – –8.2)	–1.25	15.3199
Visual-spatial	0.1056	–5.5 (–11.3–0.65)	–0.76	2.12
Verbal function	0.0098[a]	–21.95 (–44.85 – –6.15)	–0.92	4.1335
Motor skills	0.0827	–3.9 (–7.55–2.2)	–0.52	0.85
Chalder fatigue scale	0.0059[a]	18 (9.5–26)	1.75	98.13

[a]significant difference between time points; BF = Bayes factor; CI = confidence interval; IPS = information processing speed.

2022

Clinical Medicine 2021 Vol 21, No 6: e629–32

HBOT in Long-Haulers' Syndrome:Case Report

- 55 y.o. man 3 months post COVID with:
- Decreased memory, multi-tasking, energy, breathing, physical fitness
- Perfusion MRI, DTI, cognitive tests, cardiopulmonary tests
- 60 HBOTs @ 2.0 ATA/90 (20 mins. O_2 w 5 min. Abs), qd, 5d/week

Bhaiyat *et al. Journal of Medical Case Reports (2022) 16:80*
https://doi.org/10.1186/s13256-022-03287-w

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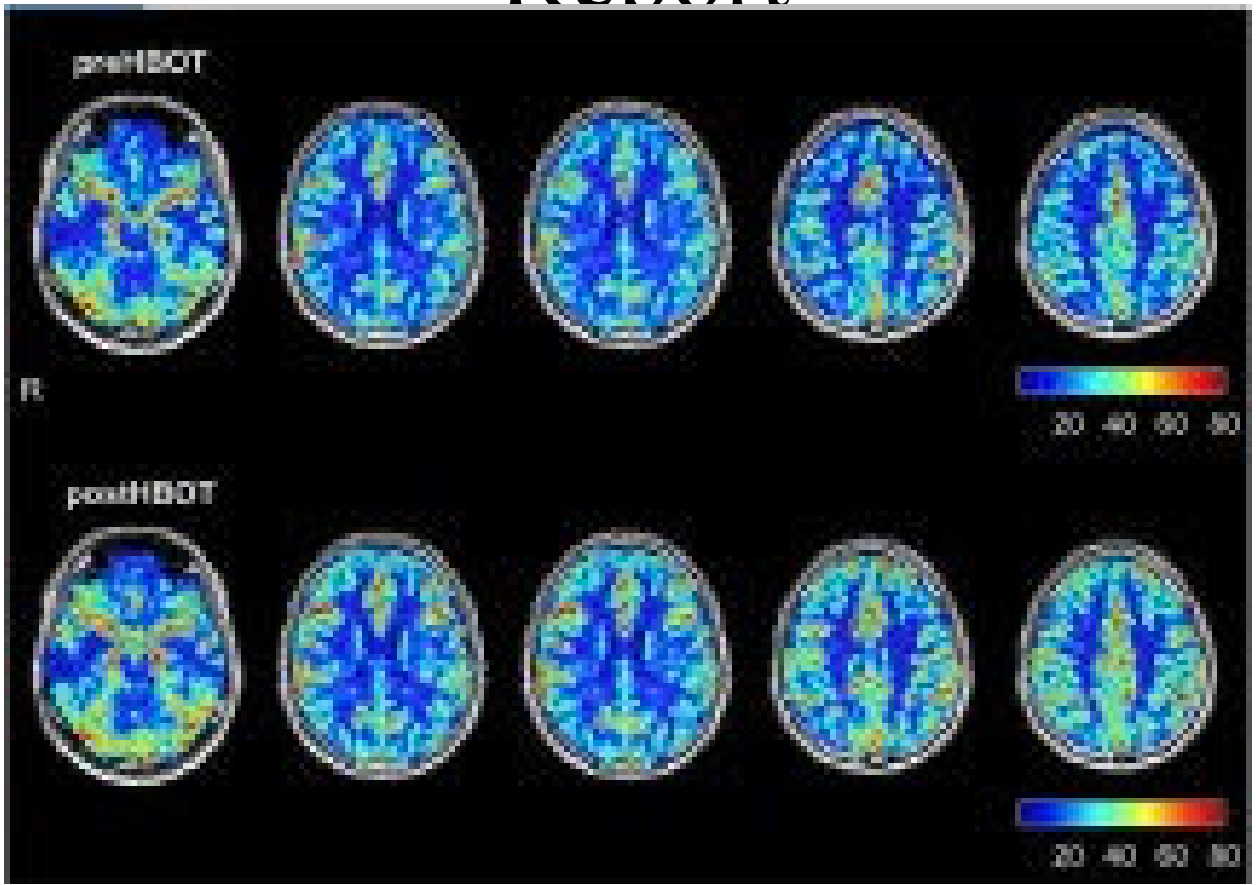
HBOT in Long-Haulers' Syndrome:Case Report



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HBOT in Long-Haulers' Syndrome: Case Report

Table 4 Cognitive scores before and after hyperbaric oxygen therapy

Neurotrax	Pre-HBOT	Post-HBOT	Change in %
Global cognitive score	93.3	99.4	6.5
Memory	98.8	105.8	7.1
Nonverbal memory	96.2	114	18.5
Delayed nonverbal memory	105.6	113.6	7.6
Verbal memory	92.1	94.5	2.6
Delayed verbal memory	101.3	101.3	0
Executive function	101.2	112.6	11.3
Information processing speed	74.6	80.8	8.3
Attention	87.9	92.1	4.8
Motor skills	104	105.6	1.5

HBOT-Long-Haulers-RCT

scientific reports

Check for updates

OPEN

Hyperbaric oxygen therapy improves neurocognitive functions and symptoms of post-COVID condition: randomized controlled trial

Shani Zilberman-Itskovich[1,2,4], Merav Catalogna[1,4], Efrat Sasson[1], Karin Elman-Shina[1,2], Amir Hadanny[1,2], Erez Lang[1,2], Shachar Finci[1,2], Nir Polak[1,2], Gregory Fishlev[1,2], Calanit Korin[1,2], Ran Shorer[1], Yoav Parag[1], Marina Sova[1] & Shai Efrati[1,2,3]✉

https://doi.org/10.1038/s41598-022-15565-0

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HBOT-Long-Haulers-RCT

RCT: 37 HBOT, 36 control patients with cognitive Sx at least 3 mos. post COVID.

HBOT: 2.0 ATA/90 mins. with q20 min. air breaks, qd, 5d/week, 8 weeks, 40 Rx's.
Control: 1.2 ATA air/5 mins, 1.03 ATA air/85 mins., qd, 5d/week, 8 weeks, 40 Rx's.

Outcomes: Mindstreams computer testing, MRI, MRI diffusion, and DTI, various Sx questionnaires, and PFT's pre and 1-3 weeks post treatment.

https://doi.org/10.1038/s41598-022-15565-0

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HBOT-Long-Haulers-RCT

RESULTS:

	HBOT				Control				p-value baseline	Net effect size*	ANOVA (group-by-time) interaction	
	Pre	Post	p-value**	Change	Pre	Post	p-value**	Change			F	p-value
N	37				36							
Score	98.3 ± 11.1	104.1 ± 7.2	**0.0001**	5.8 ± 7.9	98.9 ± 8.5	101.3 ± 8.9	0.0105	2.4 ± 5.4	0.821	0.495	4.469	0.038
Memory	93.7 ± 13.4	102.0 ± 10.9	**0.0001**	8.3 ± 11.2	94.9 ± 12.2	102.1 ± 8.7	**0.0000**	7.2 ± 8.5	0.695	0.111	0.226	0.636
Executive function	103.5 ± 13.1	109.0 ± 8.2	**0.0029**	5.6 ± 10.6	102.5 ± 10.3	103.8 ± 10.5	0.2526	1.3 ± 6.8	0.725	0.477	4.159	0.045
Attention	97.3 ± 16.0	101.9 ± 9.0	0.0292	4.6 ± 12.4	99.6 ± 8.2	99.4 ± 10.1	0.8495	− 0.3 ± 8.3	0.434	0.463	3.914	0.052
Information processing speed	94.8 ± 14.2	102.4 ± 13.0	**0.0003**	7.6 ± 11.4	94.4 ± 14.2	98.3 ± 17.7	0.0734	3.9 ± 12.7	0.910	0.303	1.673	0.200
Motor skills	102.4 ± 12.6	105.3 ± 8.3	0.0827	2.9 ± 10.0	102.9 ± 8.4	102.9 ± 9.0	0.9639	0.1 ± 6.7	0.858	0.338	2.079	0.154

https://doi.org/10.1038/s41598-022-15565-0

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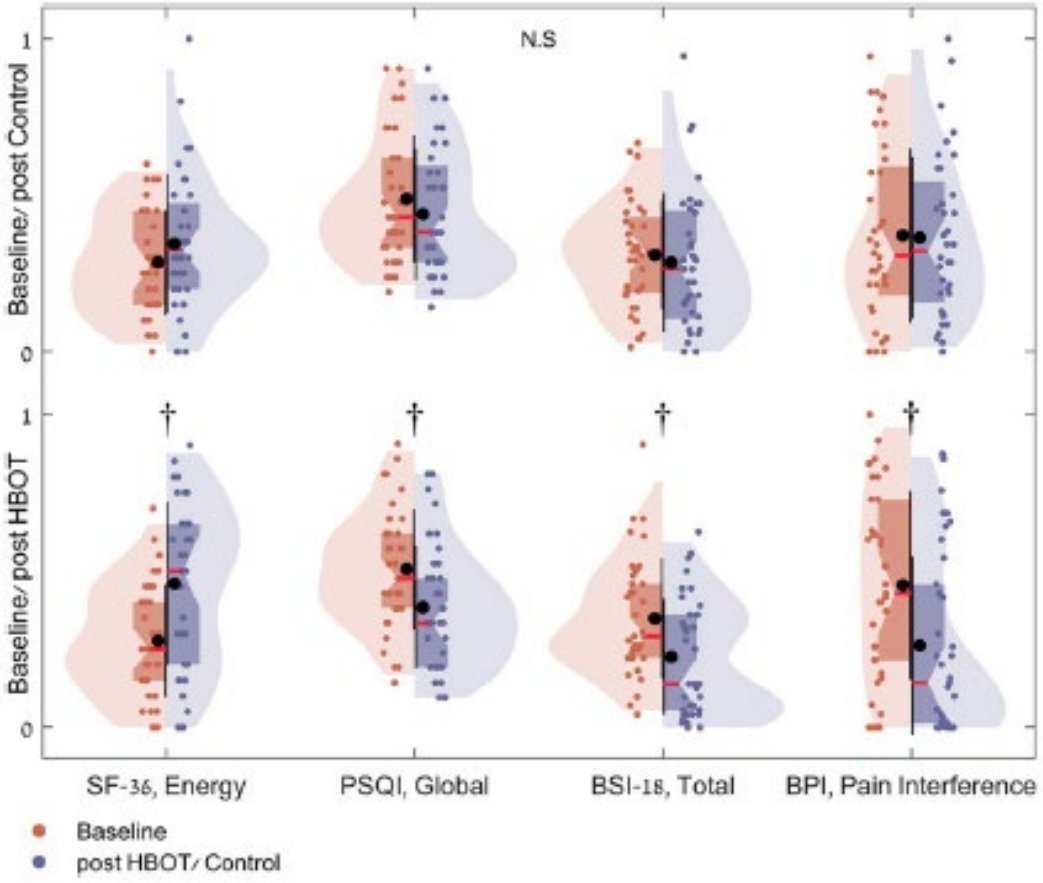
HBOT-Long-Haulers-RCT

RESULTS:



https://doi.org/10.1038/s41598-022-15565-0

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HBOT-Long-Haulers-RCT

RESULTS:

Significant increases/improvements:

1. Global cognitive, attention, and executive function.
2. Energy, sleep, psychiatric symptoms, pain interference
3. Brain MRI perfusion and microstructural changes in multiple areas associated with clinical outcomes.

https://doi.org/10.1038/s41598-022-15565-0

What About HBOT for COVID Vaccine Injury?

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine through 6 Months

S.J. Thomas, E.D. Moreira, Jr., N. Kitchin, J. Absalon, A. Gurtman, S. Lockhart,

Randomized Controlled Trial
N Engl J Med
. 2021 Nov 4;385(19):1761-1773.
doi: 10.1056/NEJMoa2110345. Epub 2021 Sep 15.

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Pfizer-BNT-COVID Vaccine Injury

No new serious adverse events were considered by the investigators to be related to BNT162b2 after the data cutoff date of the previous report.[9]

Randomized Controlled Trial
N Engl J Med
. 2021 Nov 4;385(19):1761-1773.
doi: 10.1056/NEJMoa2110345. Epub 2021 Sep 15.

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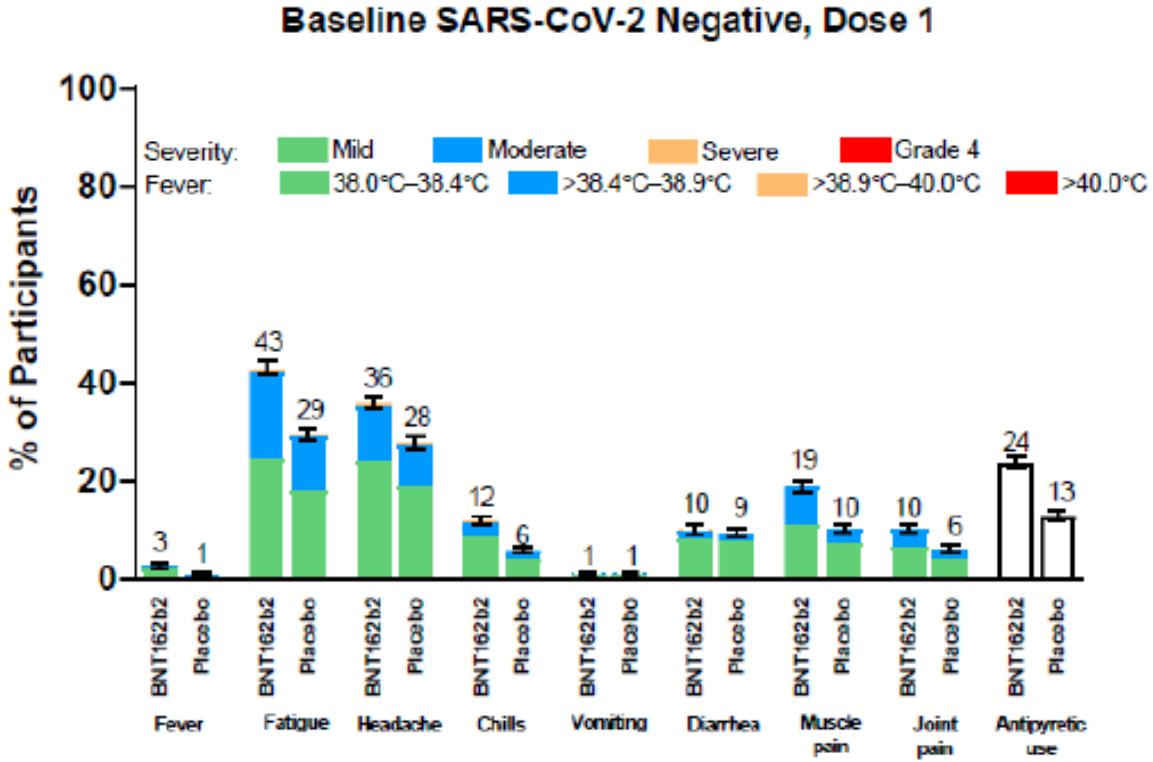
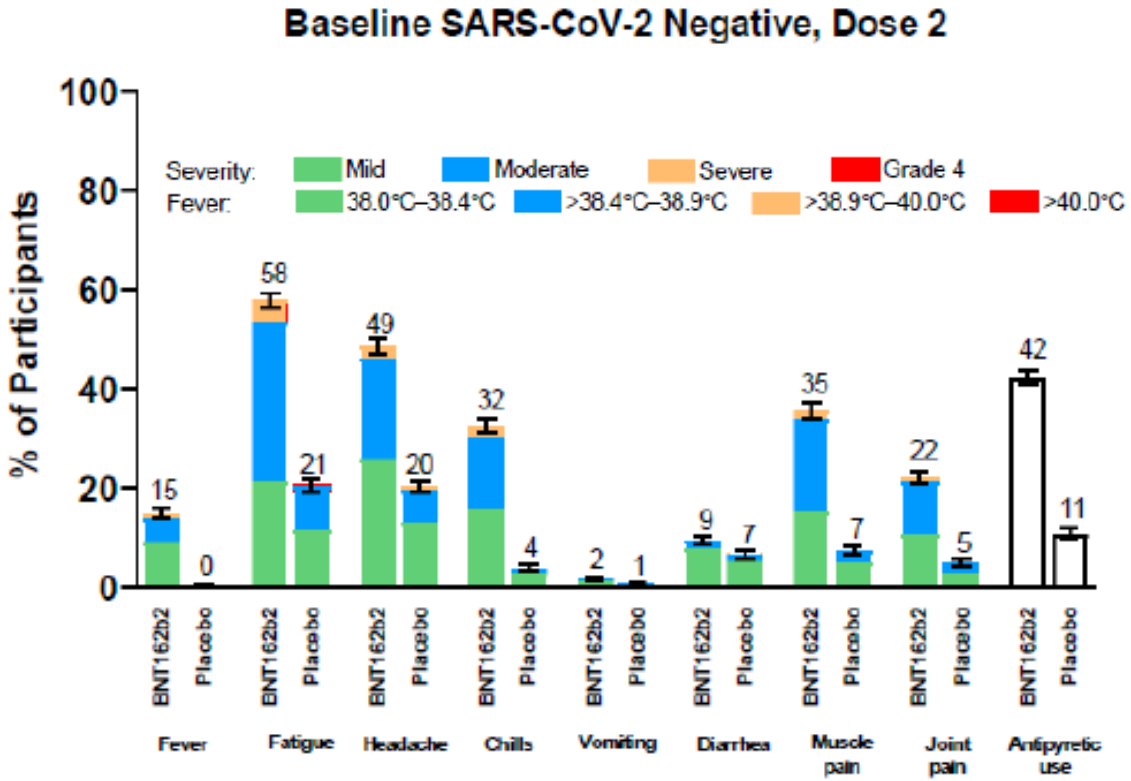
Pfizer-BNT-COVID Vaccine Injury

Serious adverse events: vaccine vs. saline placebo



Pfizer-BNT-COVID Vaccine Injury

Serious adverse events: vaccine vs. saline placebo



All COVID Vaccines Injury

Science, Public Health Policy, and The Law
Volume 2:59–80
May, 2021
Clinical and Translational Research

An Institute for Pure and Applied Knowledge (IPAK)
Public Health Policy Initiative (PHPI)

IPAK PHPI

A Report on the U.S. Vaccine Adverse Events Reporting System (VAERS) of the COVID-19 Messenger Ribonucleic Acid (mRNA) Biologicals

Jessica Rose, PhD, MSc, BSc

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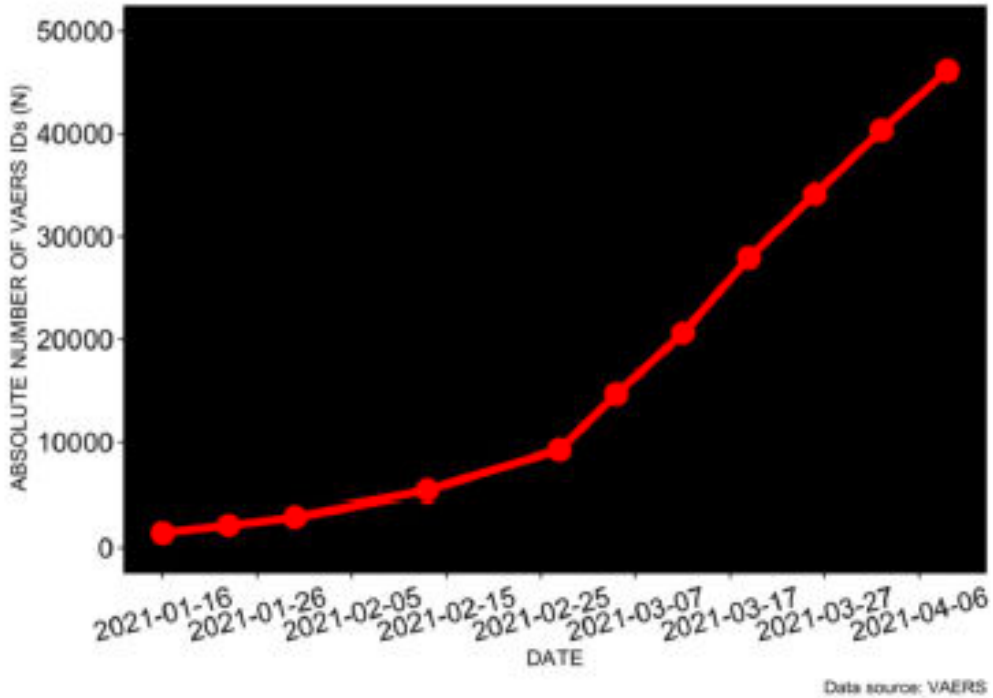
All COVID Vaccines Injury

Figure 1.2 Time series plot – Absolute number of VAERS reports for the COVID-19 products for 2021



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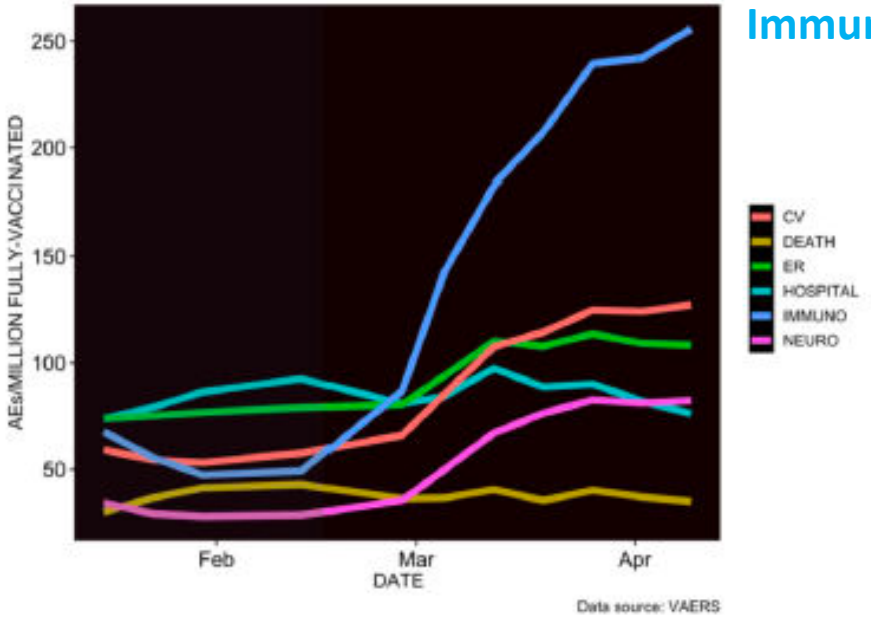
All COVID Vaccines Injury

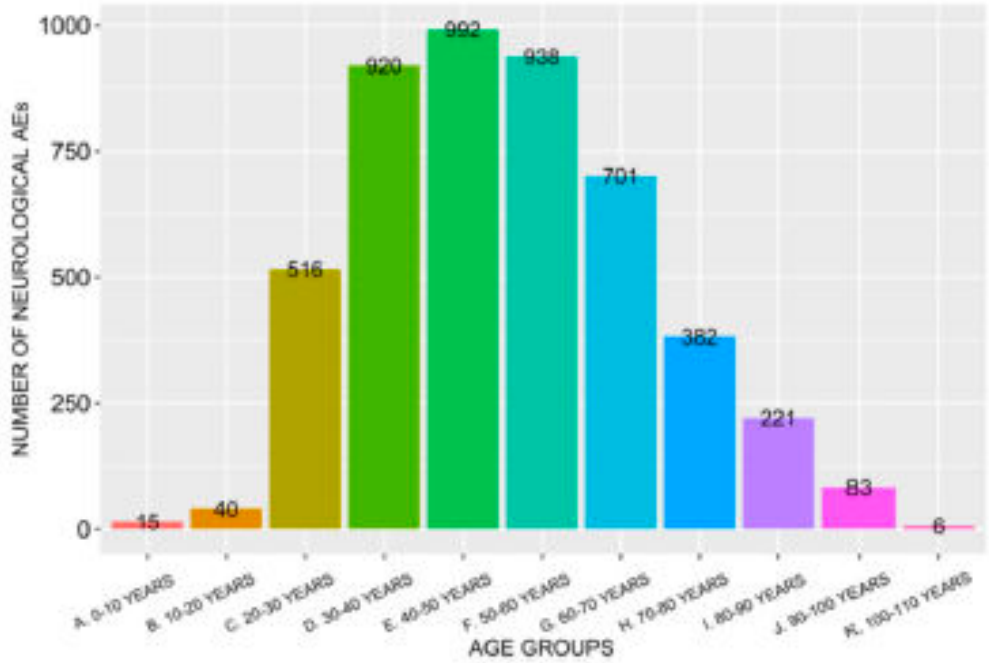
Figure 2.2 Time series plot — Relative change in deaths, ER visits, hospitalizations, cardiovascular, neurological and immunological reports with respect to the fully vaccinated population



Immunologic

All COVID Vaccines Injury

Figure 5.2 Distribution by VAERS ID according to age in individuals who reported neurological adverse events



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What About HBOT for COVID Vaccine Injury?

What is the pathology/ pathophysiology?

Immunologic

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HBOT Evidence for Treatment of COVID Vaccine Injury?

No data yet, no experience except for the case above

But, what about HBOT for other vaccine injury, autism?

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Practical Guide to Dosing of HBOT in COVID Disorders

For Acute COVID:
All data and experience appears to be at ≥1.4 ATA/30-100 mins. pressure w/ or w/o supplemental oxygen**, once/day for ~5+ HBOTs

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Practical Guide to Dosing of HBOT in COVID Disorders

For Long Hauler's Syndrome: a broad range of doses:
Published experience is at 2.0 ATA/90 mins. with air breaks x 40 Rx's in 8 weeks or 2.4/105 mins. (no air breaks?) x 10 Rx's in 10d

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Practical Guide to Dosing of HBOT in COVID Disorders

For Long Hauler's Syndrome: Additional experience with compressed air at 1.2 and 1.3 ATA/60 mins., 1.15 ATA/45 mins. oxygen, and 1.5 ATA/45 mins. oxygen x 15-40 treatments.

For COVID Vaccine Reaction: Unknown, but likely similar to COVID Long-Hauler's

Practical Guide to Dosing of HBOT in COVID Disorders

For any spike protein disease where cognitive Sx are dominant:
Three methods of dosing:

1. SPECT
2. qEEG
3. Empiric: practice of medicine

Practical Guide to Dosing of HBOT in COVID Disorders

Recommended approach in Long-Hauler's and Vaccine Reaction: Start with compressed air at 1.3 ATA and practice medicine (if after 10-15 Rx's no effect, change dosage).

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Conclusions

1. HBOT is a dual-component drug composed of increased pressure and increased pressure of breathing gases.
2. HBOT has effects on gene expression/suppression in normal cells and disease pathophysiology that are dependent on the dose of pressure and hyperoxia for a given patient with a given condition at the time of intervention in the disease process.
3. HBOT has primary effects on inflammation and immune dysregulation.
4. HBOT is showing benefit in acute COVID and in Long-Hauler's Syndrome likely based on #3.
5. The experience of HBOT in COVID vaccine reaction is limited to one known case (author's experience).
6. Dosing of HBOT in all COVID-related disorders is uncertain, but responsiveness appears across a broad range of doses.

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Thank You

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