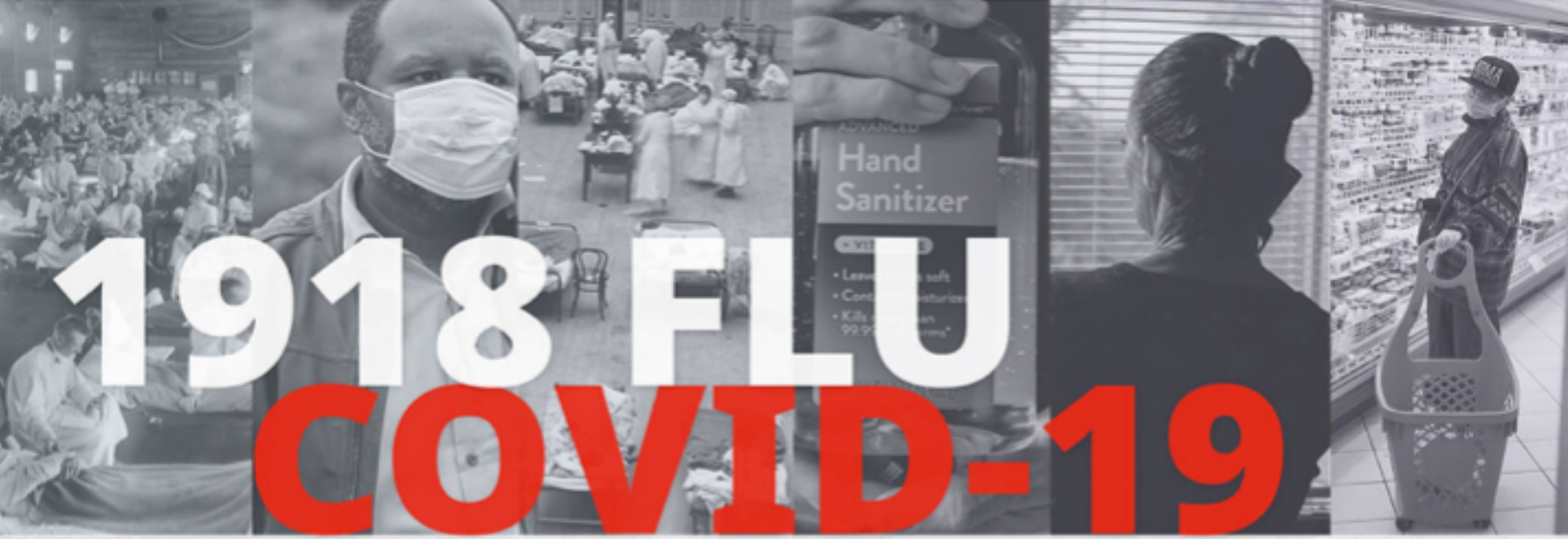

1918 FLU
COVID-19

Novel Lessons Learned from the 1918 Flu. Could they Apply to the COVID-19 Pandemic?

Symposium of Leading Physicians with Domestic and Global Experience

Seventh-day Adventist Church

AWR360° Health

WELCOME AND INTRODUCTION

Lela Lewis, MD, MPH, FACOG
Medical Director AWR 360º Health
CEO/Founder Your Best Pathway to Health

NOVEL LESSONS LEARNED FROM THE 1918 FLU AND COVID-19. COULD THEY APPLY TO THE COVID-19 PANDEMIC	
Welcome & Introduction	Lela Lewis, MD, MPH
Prayer	Duane McKey, DMin
An Appeal/Address to our Global Medical Community	Peter Landless, MD
Current State of COVID-19: Loma Linda University a Historical perspective	Richard Hart MD, DPH
1918 H1N1 Influenza Case Study - A Practical Historical Perspective	Neil Nedley, MD
Does the Science say Hydrothermal Therapy works today ?	Roger Seheult, MD
4 Potential Scenario Protocols	Zeno Charles-Marcel, MD John Kelly, MD Eric Nelson, MD Roger Seheult, MD
Hydrothermal Therapy (HT); What the science supports and doesn't support	Charles Zeno Marcel, MD
Call to Action	Roger Seheult, MD
A Wholistic Approach to Health	Mark Finley, MDiv, MPH
Prayer	Angie David, DPH
Symposium # 2: Are There Other Lessons to Be Learned?	Lela Lewis, MD, MPH
Question and Answer	

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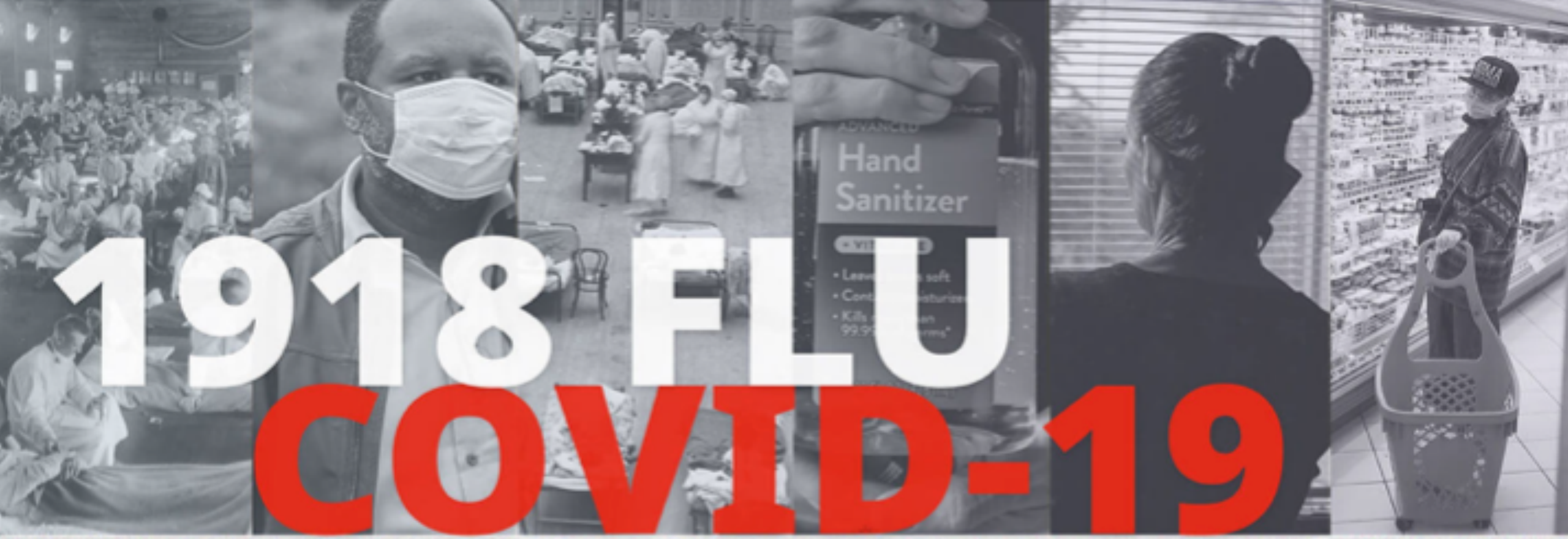
ONGOING RESEARCH
HYDROTHERMAL THERAPY (HT)

- **JOIN Facebook Group**
- **www.facebook.com/groups/2332990178727 69**



Novel Lessons Learned from the 1918 Flu. Could they Apply to the COVID-19 Pandemic?

Symposium of Leading Physicians with Domestic and Global Experience

PART 2: ULTRAVIOLET RADIATION AND OPEN SPACE

Lela Lewis, MD, MPH, FACOG
Medical Director AWR 360° Health
CEO/Founder Your Best Pathway to Health

PART 2: ULTRAVIOLET RADIATION AND OPEN SPACE

- Lela Lewis, MD, MPH, FACOG
- Medical Director AWR 360° Health
- CEO/Founder Your Best Pathway to Health

1918 flu pandemic

CDC states 675,000 deaths in the U.S.

50 million deaths worldwide

Most deaths occurred in those aged less than 5, 20-40, and over 65

Army Camp/Hospital Data

- Army camps, 20% got Spanish influenza symptoms
- 16.7% of Army personnel developing influenza symptoms contracted pneumonia
- 40% of Army personnel developing pneumonia died during this pandemic
- Death rate for influenza in Army personnel 6.7%
- 1.34% of all Army camp personnel died from the flu
- Known as the best at least medical/health care available in the USA

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Ruble, W.A. Life and Health May 1919 pg 114-115

Data Sheets from Ten Sanitariums

- 446 treated with hydrotherapy in sanitariums
- 677 treated with hydrotherapy in non supervised settings in the community
- Total of 1,123 influenza symptom patients treated

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Ruble, W.A. Life and Health May 1919 pg 114-115

677 community patients

- 55 contracted pneumonia, most had pneumonia as “well established” at the time the hydrotherapy was commenced
- 47.2% of these pneumonia patients died (26)
- 3.8% of the total outpatients with the flu died

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Ruble, W.A. Life and Health May 1919 pg 114-115

446 sanitarium patients with influenza

- Only 2.4% got pneumonia (11)
- 54.5% of those with pneumonia died (6)
- 1.3% of total influenza patients died who had received hydrotherapy in sanitarium starting from the beginning

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Ruble, W.A. Life and Health May 1919 pg 114-115

Diagnosed influenza patients

- 16.7 % pneumonia with “best medical care” v. 2.4% with best sanitarium care, major difference is hydrotherapy
- Death rate of 6.7% “best medical care” v 1.3% best sanitarium care with hydrotherapy

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Ruble, W.A. Life and Health May 1919 pg 114-115

Hutchinson City Health Officer Report

- “More than 90” of 120 dorm students/faculty diagnosed with influenza
- Treatment of Dr. H.E. Larson, good nursing care, regulated diet, rest (continued for 2-5 days after apparent recovery) no drugs and hydrotherapy treatment of heat/cold to chest, throat, abdomen
- Zero cases of pneumonia
- No deaths
- “The record is remarkable. It makes the ordinary methods of dealing with the flu appear irrational.”

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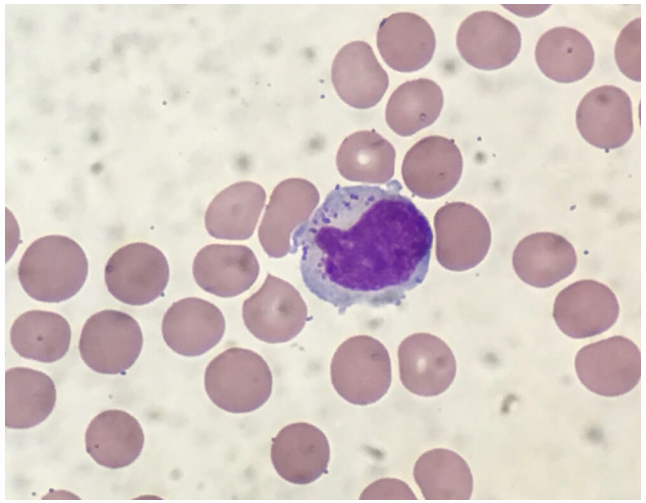
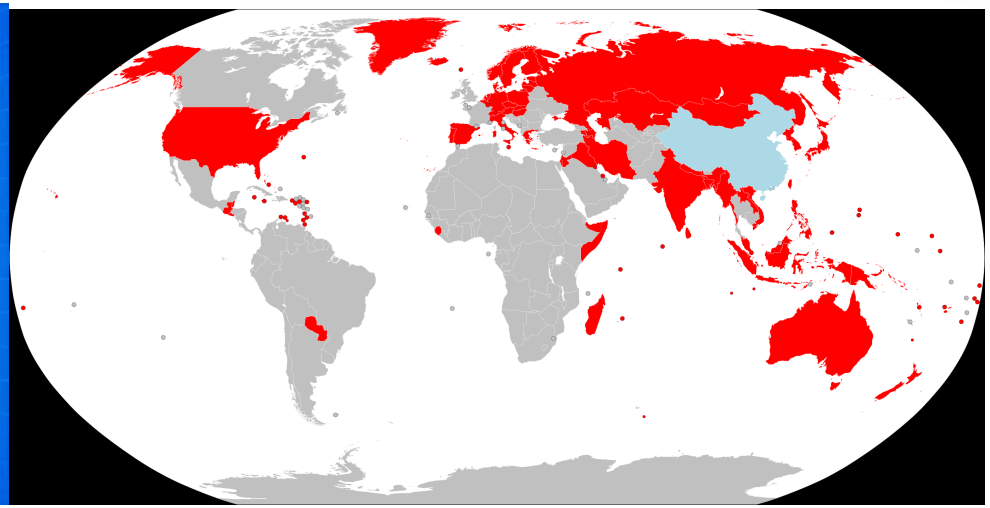
Shepherd F, Health Officer, Hutchinson City via Northern Union Paper, 1918

Hydrotherapy
What does the science say?





Roger Seheult, M.D.

Assistant Professor of Medicine Loma Linda University School of Medicine

Associate Professor of Medicine UCR School of Medicine

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Hydrotherapy
What does the science say?

No Conflicts to declare

Roger Seheult, M.D.

Assistant Professor of Medicine Loma Linda University School of Medicine

Associate Professor of Medicine UCR School of Medicine

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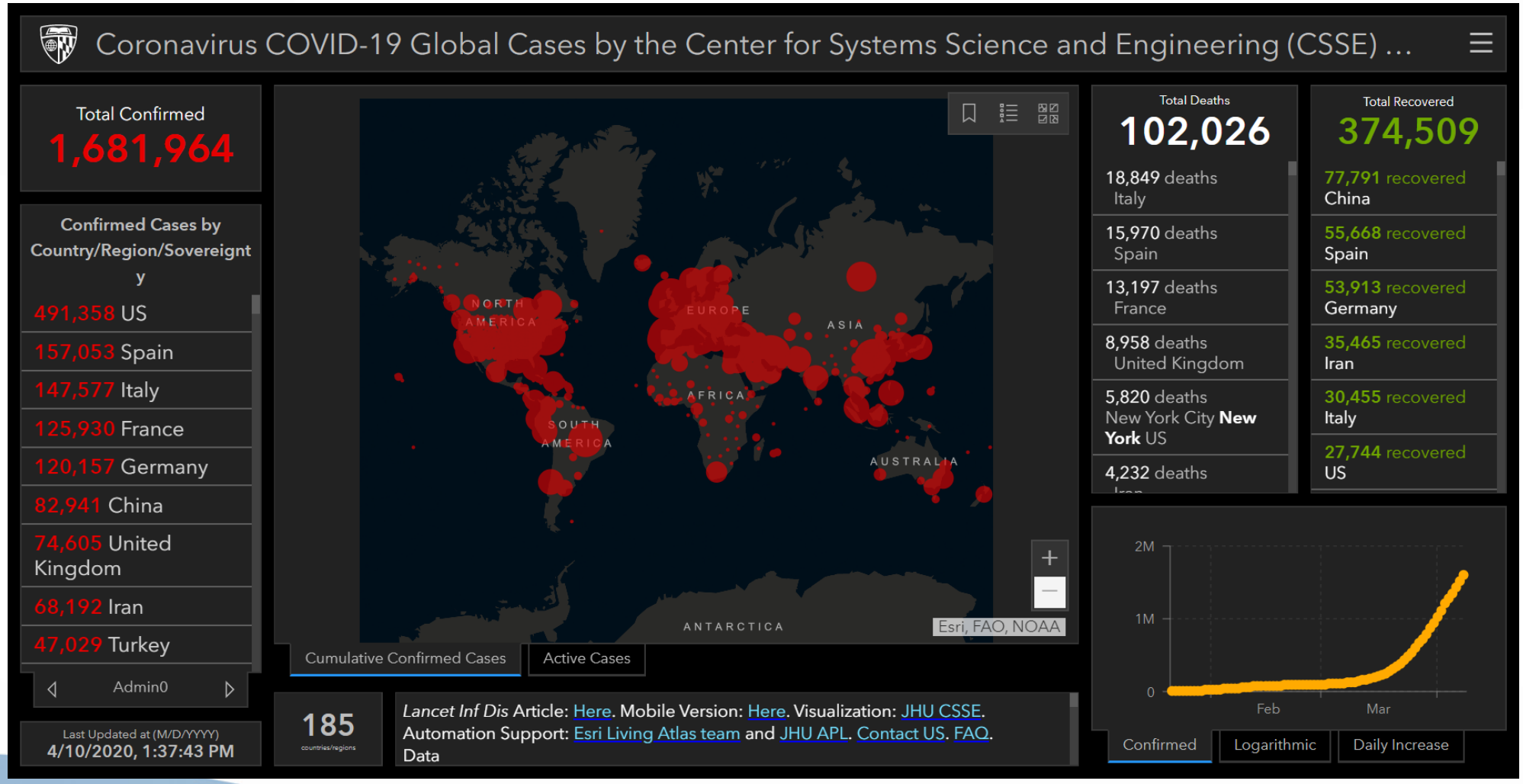
COVID-19



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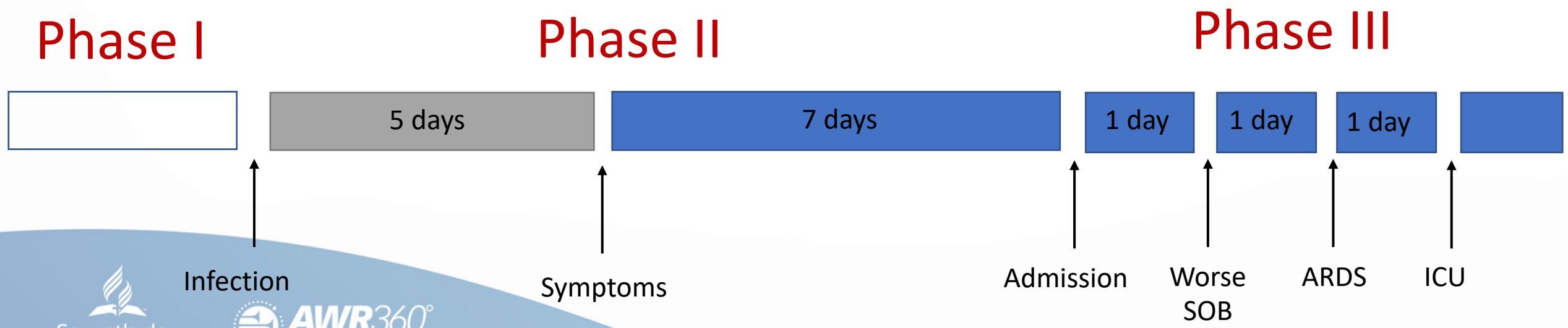
Course of the Disease

Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China

www.thelancet.com Vol 395 February 15, 2020

Chaolin Huang, Yeming Wang*, Xingwang Li*, Lili Ren*, Jianping Zhao*, Yi Hu*, Li Zhang, Guohui Fan, Jiuyang Xu, Xiaoying Gu, Zhenshun Cheng, Ting Yu, Jiaan Xia, Yuan Wei, Wenjuan Wu, Xuelei Xie, Wen Yin, Hui Li, Min Liu, Yan Xiao, Hong Gao, Li Guo, Jungang Xie, Guangfa Wang, Rongmeng Jiang, Zhancheng Gao, Qi Jin, Jianwei Wang†, Bin Cao†*



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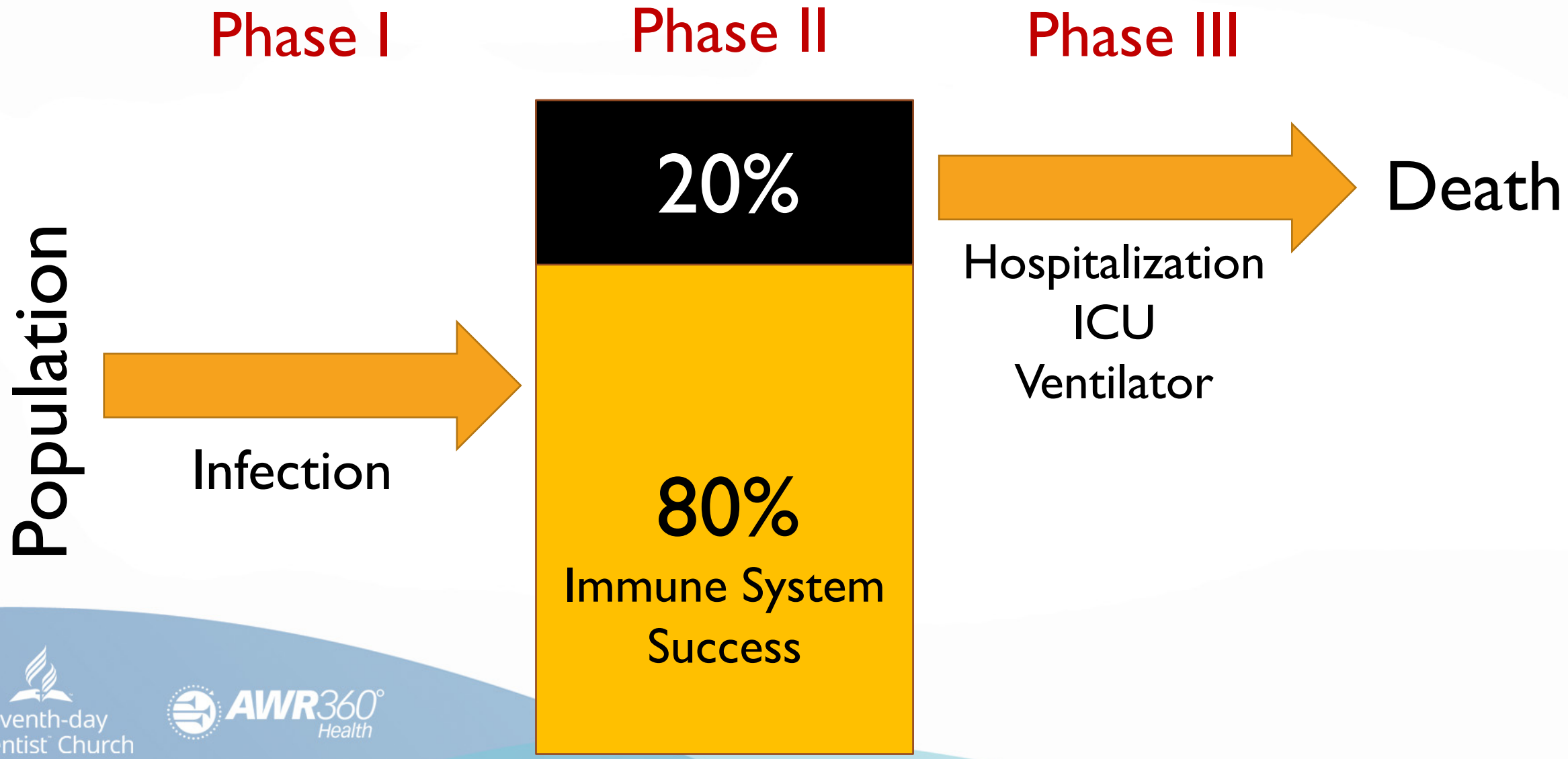
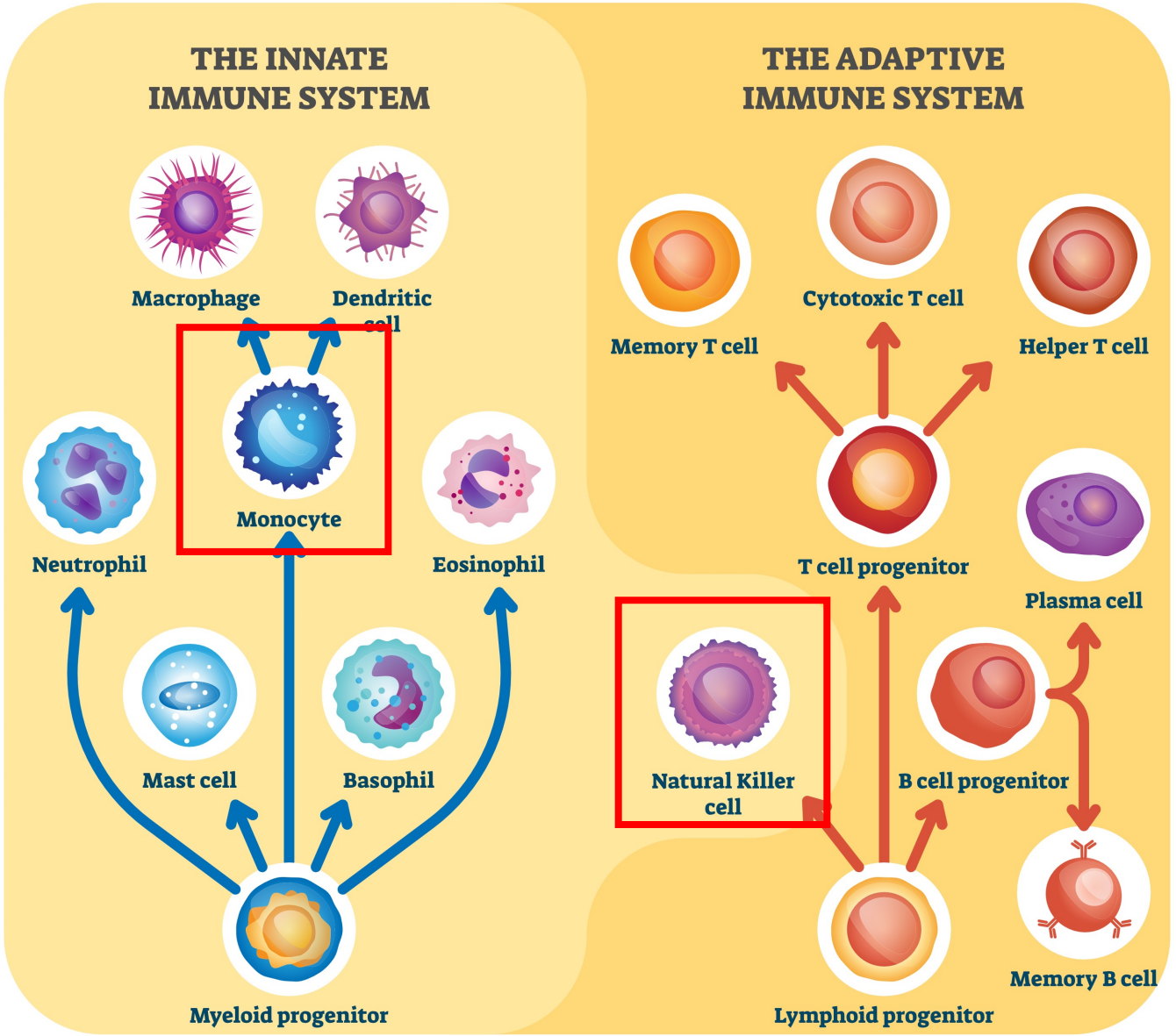
COURSE OF THE DISEASE



CELLS OF THE IMMUNE SYSTEM



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Asian Pac J Allergy Immunol. 2020 Mar;38(1):1-9. doi: 10.12932/AP-200220-0772.

Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic.

Prompetchara E[1,1,2], Ketloy C[1,1], Palaga T[3,4].

Abstract

As the world is witnessing the epidemic of COVID-19, a disease caused by a novel coronavirus, SARS-CoV-2, emerging genetics and clinical evidences suggest a similar path to those of SARS and MERS. The rapid genomic sequencing and open access data, together with advanced vaccine technology, are expected to give us more knowledge on the pathogen itself, including the host immune response as well as the plan for therapeutic vaccines in the near future. This review aims to provide a comparative view among SARS-CoV, MERS-CoV and the newly epidemic SARS-CoV-2, in the hope to gain a better understanding of the host-pathogen interaction, host immune responses, and the pathogen immune evasion strategies. This predictive view may help in designing an immune intervention or preventive vaccine for COVID-19 in the near future.

Key words: Coronavirus, immune response, COVID-19, immune evasion, immunopathology

Asian Pac J Allergy Immunol. 2020 Mar;38(1):1-9. doi: 10.12932/AP-200220-0772.

Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic.

Prompetchara E[1,1,2], Ketloy C[1,1], Palaga T[3,4].

-increase neutrophils and decreased lymphocytes (similar to SARS and MERS)

-this correlated with increase chance of death

-known that SARS and MERS suppress the innate immune response

-COVID-19 may dampen anti-viral IFN responses resulting in uncontrolled viral replication

-the issue is with the innate immune system

-suppressed at first then is allowed to go into overdrive

Asian Pac J Allergy Immunol. 2020 Mar;38(1):1-9. doi: 10.12932/AP-200220-0772.

Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic.

Prompetchara E[1,1,2], Ketloy C[1,1], Palaga T[3,4].

"Based on the accumulated data for previous coronavirus infection, innate immune response plays crucial role in protective or destructive responses and may open a window for immune intervention. Active viral replication later results in hyperproduction type I IFN and influx of neutrophils and macrophages which are the major sources of pro-inflammatory cytokines. With similar changes in total neutrophils and lymphocytes during COVID19, SARS-CoV-2 probably induces delayed type I IFN and loss of viral control in an early phase of infection. Individuals susceptible to CoVID19 are those with underlying diseases, including diabetes, hypertension, and cardiovascular disease. In addition, no severe cases were reported in young children, when innate immune response is highly effective. These facts strongly indicate that innate immune response is a critical factor for disease outcome."

The Involvement of Natural Killer Cells in the Pathogenesis of Severe Acute Respiratory Syndrome FREE

National Research Project for SARS, Beijing Group Author Notes

American Journal of Clinical Pathology, Volume 121, Issue 4, April 2004, Pages 507–511,
https://doi.org/10.1309/WPK7Y2XKNF4CBF3R
Published: 04 January 2004

The total number of NK and CD158b+ NK cells and the percentage of CD158b+ NK cells were significantly lower in patients with SARS than in those with M pneumoniae infection ($P < .05$ for all) and healthy subjects ($P < .01$, $P < .01$, $P < .05$, respectively); in 72 patients with severe SARS than in 149 with mild SARS ($P < .05$ for all); and in 174 cases of SARS with anti-SARS coronavirus–specific IgG and/or IgM antibodies than in 47 without antibodies ($P < .05$, $P < .01$, $P < .01$, respectively). There were no significant differences for the 3 values among patients with SARS without anti-SARS coronavirus antibody, patients with M pneumoniae infection, and healthy subjects.

MENU nature medicine

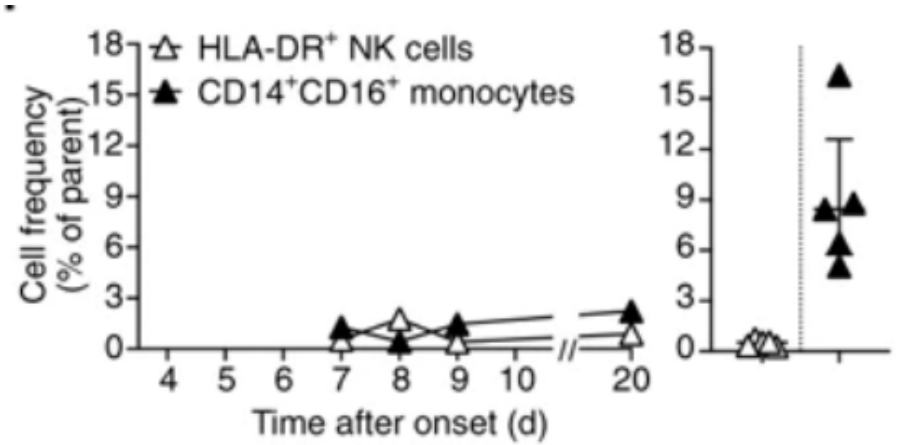
Correspondence | Published: 16 March 2020

Breadth of concomitant immune responses prior to patient recovery: a case report of non-severe COVID-19

Irani Thevarajan, Thi H. O. Nguyen, Marios Koutsakos, Julian Druce, Leon Caly, Carolien E. van de Sandt, Xiaoxiao Jia, Suellen Nicholson, Mike Catton, Benjamin Cowie, Steven Y. C. Tong, Sharon R. Lewin & Katherine Kedzierska

Nature Medicine (2020) | Cite this article

334k Accesses | **2** Citations | **3033** Altmetric | Metrics



J Clin Invest. 2019 Sep 3;129(9):3482-3491. doi: 10.1172/JCI128877.

Targeting innate immunity for tuberculosis vaccination.

Khader SA[1], Divangahi M[2], Hanekom W[3], Hill PC[4], Maeurer M[5,6], Makar KW[3], Mayer-Barber KD[7], Mhlanga MM[8], Nemes E[9], Schlesinger LS[10], van Crevel R[11], Vankayalapati R(12], Xavier RJ[13,14,15,16], Netea MG[11,17]; Bill and Melinda Gates Foundation Collaboration for TB Vaccine Discovery Innate Immunity Working Group18.

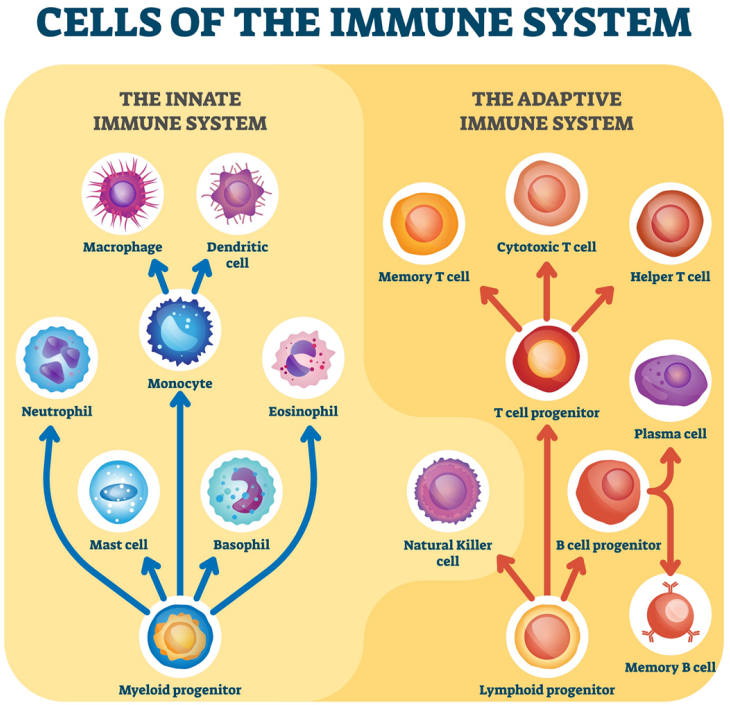
Author information

Abstract

Vaccine development against tuberculosis (TB) is based on the induction of adaptive immune responses endowed with long-term memory against mycobacterial antigens. Memory B and T cells initiate a rapid and robust immune response upon encounter with Mycobacterium tuberculosis, thus achieving long-lasting protection against infection. Recent studies have shown, however, that innate immune cell populations such as myeloid cells and NK cells also undergo functional adaptation after infection or vaccination, a de facto innate immune memory that is also termed trained immunity. Experimental and epidemiological data have shown that induction of trained immunity contributes to the beneficial heterologous effects of vaccines such as bacille Calmette-Guérin (BCG), the licensed TB vaccine. Moreover, increasing evidence argues that trained immunity also contributes to the anti-TB effects of BCG vaccination. An interaction among immunological signals, metabolic rewiring, and epigenetic reprogramming underlies the molecular mechanisms mediating trained immunity in myeloid cells and their bone marrow progenitors. Future studies are warranted to explore the untapped potential of trained immunity to develop a future generation of TB vaccines that would combine innate and adaptive immune memory induction.

PMID: 31478909 PMCID: PMC6715374 [Available on 2020-09-03] DOI: 10.1172/JCI128877

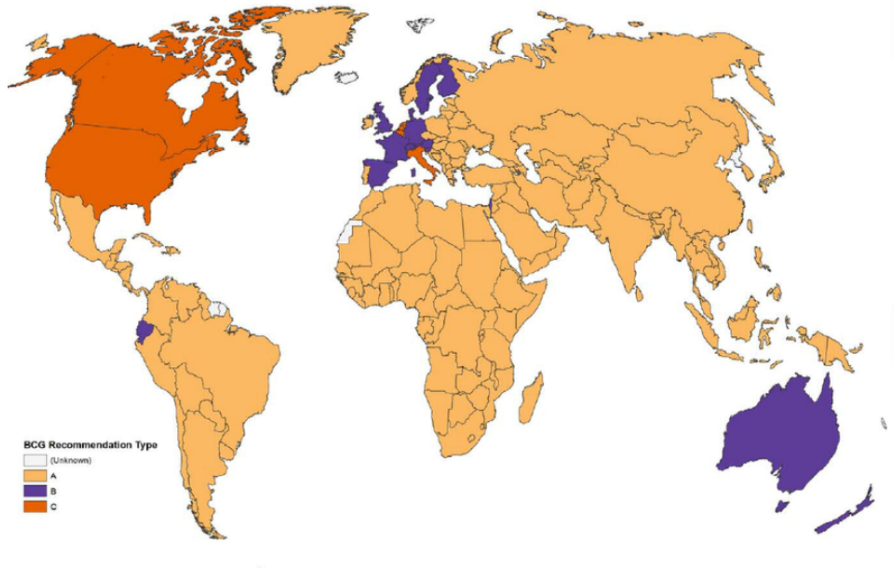
Free full text



BCG vaccination policies make a ten times difference in COVID-19 incidence, mortality: New study

April 6, 2020

"While we expected to see a protective effect of BCG, the magnitude of the difference (almost 10 fold) in incidence and mortality (of Covid-19) between countries with and without a BCG vaccination program was pleasantly surprising," said Dr. Ashish Kamat, a co-author of the paper and professor of Urologic Oncology (Surgery) and cancer research at MD Anderson Cancer Center in Houston, Texas.



Map displaying BCG vaccination policy by country. A: The country currently has universal BCG vaccination program. B: The country used to recommend BCG vaccination for everyone, but currently does not. C: The country never had universal BCG vaccination programs. doi:10.1371/journal.pmed.1001012.g002

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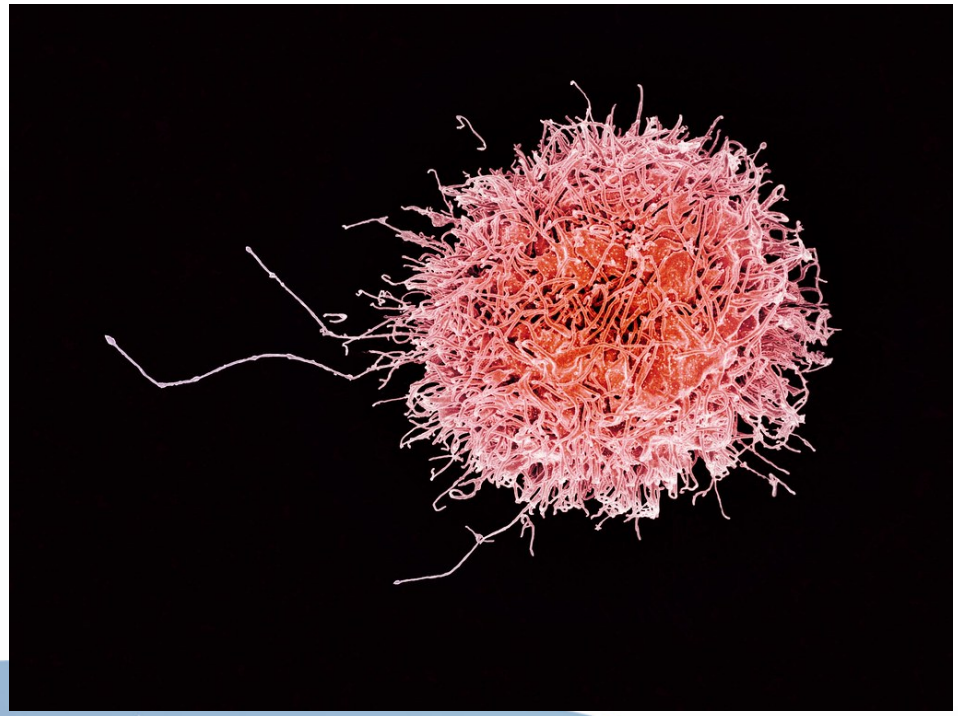
INNATE IMMUNITY A TARGET FOR TREATMENT



- New Jersey-based therapeutics company Celularity is awaiting permission from the FDA to test whether a cancer treatment could be effective against COVID-19.
- The cell therapy works by boosting the body's early immune response in a way that could target the coronavirus.
- The company transforms placental stem cells into one-size-fits-all "Natural Killer" cells that act as sentinels and keep the virus from replicating out of control.

Israeli COVID-19 treatment shows 100% survival rate - preliminary data

Not only have all the patients survived, according to Pluristem, but four of them showed improvement in respiratory parameters.

By MAAYAN JAFFE-HOFFMAN APRIL 8, 2020 23:59

Not only have all the patients survived, according to Pluristem, but four of them showed improvement in respiratory parameters and three of them are in the advanced stages of weaning from ventilators. Moreover, two of the patients with preexisting medical conditions are showing clinical recovery in addition to the respiratory improvement.

"We are pleased with this initial outcome of the compassionate use program and committed to harnessing PLX cells for the benefit of patients and healthcare systems," said Pluristem CEO and president Yaky Yanay. "Pluristem is dedicated to using its competitive advantages in large-scale manufacturing to potentially deliver PLX cells to a large number of patients in significant need."

Pluristem's PLX cells are "allogeneic mesenchymal-like cells that have immunomodulatory properties," meaning they induce the immune system's natural regulatory T cells and M2 macrophages, the company explained in a previous release. The result could be the reversal of dangerous overactivation of the immune system. This would likely reduce the fatal symptoms of pneumonia and pneumonitis (general inflammation of lung tissue).

STEM CELLS®

TISSUE-SPECIFIC STEM CELLS

Mesenchymal Stromal Cells Prevent Allostimulation *in vivo* and Control CheckPoints of Th1 Priming: Migration of Human DC to Lymph Nodes and NK Cell Activation

C. CONSENTIUS[1,2]; L. AKYÜZ[1,3]; J. A. SCHMIDT-LUCKE[4,x]; C. TSCHÖPE[1,5]; L. PINZUR[6]; R. OFIR[6], P. REINKE[1,7]; H.-D. VOLK[1,3]; K. JUELKE[1,*;#]

[1] Berlin-Brandenburg Center for Regenerative Therapies (BCRT), Charité University Medicine, Berlin, Germany; [2] Berlin-Brandenburg School for Regenerative Therapies (BSRT), Charité University Medicine, Berlin, Germany; [3] Institute for Medical Immunology, Charité University Medicine, Berlin, Germany; [4] Franziskus Hospital, Berlin, Germany; [5] Dept. for Cardiology, CVK, Charité University Medicine, Berlin, Germany; [6] Pluristem Therapeutics Inc., Haifa, Israel; [7] Dept. for Nephrology and Intensive Care, CVK, Charité University

Key words. mesenchymal stromal cells • myeloid dendritic cells • natural killer cells • IL-10 • Th1 priming • immunomodulation

ABSTRACT

TREND WATCH

Researchers to collaborate on natural killer cell-based COVID-19 treatment

March 30, 2020

Green Cross LabCell, a South Korea-based biopharmaceutical company, announced it will begin development of a COVID-19 treatment based on its anticancer therapy work using natural killer cells.

SUMMARY

Working Hypotheses:

1) SARS-CoV-2 infection is downregulates innate immunity

2) SARS-CoV-2 is allowed to progress because innate immunity is not strong enough

3) Strengthening the innate immune system (NK cells, monocytes etc) might prevent or stop COVID-19

WHAT CAN STRENGTHEN NATURAL IMMUNITY

1) Sleep 7+ hours
2) Nutrition – avoiding sugar
3) Others…
4) Water…

Wien Klin Wochenschr. 2002 Feb 15;114(3):102-7.

Human monocyte stimulation by experimental whole body hyperthermia.

Zellner M[1], Hergovics N, Roth E, Jilma B, Spittler A, Oehler R. N = 12

Author information

Abstract

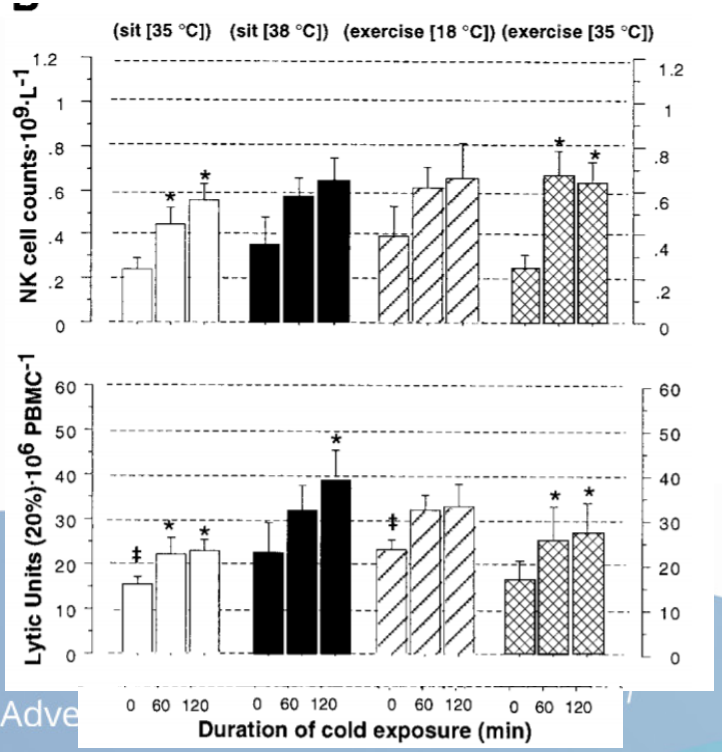
The thermal effect of fever, an evolutionarily conserved acute-phase response, has been associated with better survival and a shorter duration of disease in cases of infection. The molecular consequence of this beneficial fever response is poorly understood. To determine the influence of hyperthermia on human monocytes, which are important for the recognition and elimination of pathogens, twelve healthy volunteers were immersed in a 39.5 degrees C hot water bath to increase their body temperature. The expression of the endotoxin receptor CD14 and the complement receptor CD11b increased after the hot water bath ($P < 0.05$), whereas the expression of the selectin CD62L, which mediates the initial attachment of leukocytes at the endothelium during inflammation, was downregulated after hyperthermia ($P < 0.05$). Comparable changes in monocyte receptor expression were observed after in vitro hyperthermia. Furthermore, 3 hours after in vivo hyperthermia, the response of monocytes to endotoxin was enhanced in an ex vivo lipopolysaccharide stimulation assay, as expressed by a greater TNF-alpha release ($P < 0.05$). We conclude that the thermal effect of fever directly activates monocytes, which increases their ability to respond to bacterial challenge.

Immune changes in humans during cold exposure: effects of prior heating and exercise

March 1999

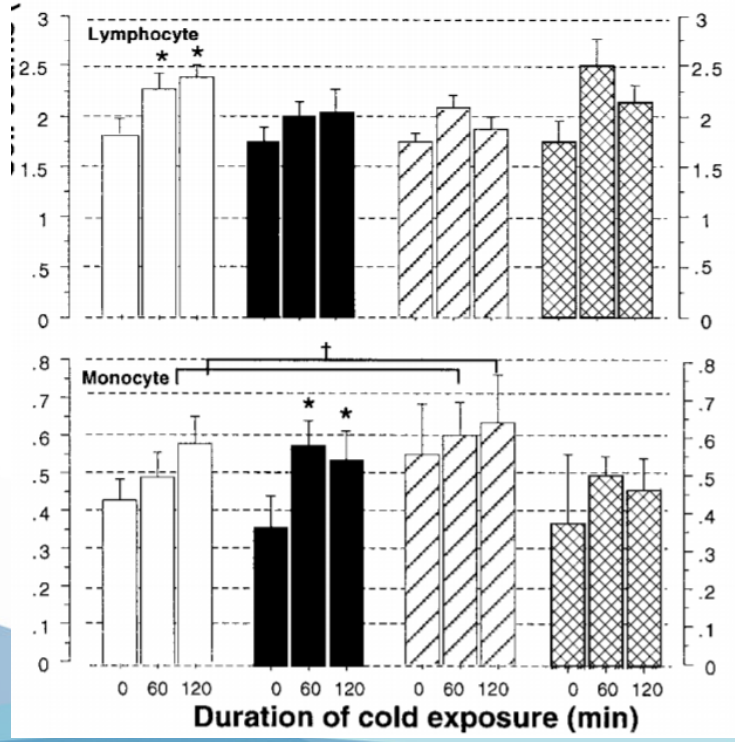
I. K. M. BRENNER,[1] J. W. CASTELLANI,[2] C. GABAREE,[2] A. J. YOUNG,[2]
J. ZAMECNIK,[1] R. J. SHEPHARD,[1,3,4] AND P. N. SHEK[1,3,5]
[1]*Defence and Civil Institute of Environmental Medicine, Toronto, Ontario M3M 3B9;* [2]*US Army Research Institute of Environmental Medicine, Natick, Massachusetts 01760;* [3]*Faculty of Physical Education and Health,* [4]*Department of Public Health Sciences, and* [5]*Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Ontario M3M 3B9*

Natural Killer Cells



Lymphocytes

Monocytes



Conclusions

This study suggests that, despite popular beliefs that cold exposure can precipitate a viral infection, the innate component of the immune system is not adversely affected by a brief period of cold exposure. Indeed, the opposite seems the case. The fall in core body temperature resulting from cold exposure led to a consistent and statistically significant mobilization of circulating cells, an increase in NK cell activity, and elevations in circulating IL-6 concentrations.

N = 7 for each group

Effects of thermal stress (sauna + swimming in ice-cold water) in man on the blood concentration and production of pro-inflammatory cytokines and stress hormones

B. Dugué , E. Leppänen , R. Gräsbeck 1998 N = 20

Abstract

The pattern of cytokine response after a thermal stress (sauna + swimming in ice cold water) was investigated in 20 subjectively healthy persons at the end of the winter season: 12 habitual winter swimmers (WS) and 8 unexperienced winter swimmers (NWS). We measured the levels of interleukin-1 beta (IL-1 beta), interleukin-6 (IL-6) and its soluble receptor (IL-6 sR), serum cortisol, and plasma ADH before and after the stress. We also cultivated isolated peripheral blood mononuclear cells and measured the lipopolysaccharide (LPS) induced release of cytokines.The basal concentrations of leukocytes, monocytes, and plasma IL-6 were significantly higher in WS than in NWS. In both groups granulocytosis, haemoconcentration and significant increase in the concentrations of ADH, cortisol, IL-6 and its soluble receptor were observed after the stimuli. However, the changes in the cortisol concentration were dramatically larger in WS than in NWS and a significant positive correlation was found between these changes and the basal plasma concentration of IL-6. In cell cultures, the LPS-induced release of IL-1 beta and IL-6 were dramatically suppressed after the exposure to the stimuli in the NWS and significantly increased in the WS.It seems that the stresses described here are able to challenge both the neuro-endocrine and the immune systems and that adaptive mechanisms occur with habitual winter swimming.

Journal of Human Kinetics volume 39/2013, 127-135 DOI: 10.2478/hukin-2013-0075
Section II- Exercise Physiology & Sports Medicine

Effect of a Single Finnish Sauna Session on White Blood Cell Profile and Cortisol Levels in Athletes and Non-Athletes

by

Wanda Pilch[1,4], Ilona Pokora[2], Zbigniew Szyguła[1,4], Tomasz Pałka [1,4], Paweł Pilch[3], Tomasz Cisoń [1,4], Lesław Malik[3], Szczepan Wiecha [1]

Published in final edited form as:
Nat Rev Immunol. 2015 June ; 15(6): 335–349. doi:10.1038/nri3843.

Fever and the thermal regulation of immunity: the immune system feels the heat

Sharon S. Evans, **Elizabeth A. Repasky**, and **Daniel T. Fisher**
Department of Immunology, Roswell Park Cancer Institute, Elm & Carlton Streets, Buffalo, NY, USA

"Although febrile temperatures initially increase the production of pro-inflammatory cytokines by macrophages at sites of inflammation, there is also evidence that thermal stress dampens cytokine synthesis once macrophages become activated. This sequence of events is analgous to natural fever, which often occurs after macrophages and other innate immune cells initially encounter PAMPs. In this regard, human monocyte derived macrophages with an activated phenotype produce less TNF, IL-6, and IL-1β when exposed to febrile temperatures than heat-inexperienced cells. Heat reduces transcription of pro-inflammatory cytokines through repressive activities of HSF1, together with diminished recruitment of NF-κB to the promoter regions of cytokine-encoding genes, and also lowers cytokine mRNA stability. Thermal treatment of LPS-activated macrophages also appears to dial down inflammation by inhibiting the release of the inflammatory DAMP known as high mobility group box 1 (HMGB1), which is a ligand for TLR2 and TLR4.170,174 Inhibition of HMGB1 release prevents the subsequent activation of NF-κB, which controls the synthesis of pro-inflammatory cytokines in innate immune cells. The idea that heat can dampen an on-going pro-inflammatory condition in vivo has recently been tested in a murine model of collagen-induced arthritis. Mice exposed to fever-range hyperthermia had significantly less joint damage, correlated with a reduction in serum TNF levels and increased IL-10 production in inflamed joints. Collectively, these findings suggest that strategic temperature shifts contribute to a biochemical negative feed-back loop that protects tissues against damage from excessive cytokine release following infection.

SUMMARY

Working Hypotheses:

1) Innate Immunity can be strengthened by manipulating external heat/cold applied to the body

2) Heating and cooling seems to increase markers of innate immunity (NK cells, Macrophages)

3) These interventions don't necessarily seem to exacerbate the "cytokine storm" implicated in ARDS or pneumonia

Psychiatriki. 2013 Jul-Sep;24(3):208-12.

Julius Wagner-Jauregg (1857-1940): Introducing fever therapy in the treatment of neurosyphilis.

Karamanou M[1], Liappas I, Antoniou Ch, Androutsos G, Lykouras E.

Author information

Wagner Jauregg noted that insane patients with general paralysis occasionally became sane after some febrile episode. Many times this was from neurosyphilis
malaria infection was an acceptable risk for the patients, as quinine would be administered as soon as syphilis was cured.
Patients were inoculated via intravenous injections with malaria (known cure was administration of quinine sulfate to terminate the malaria infection) - 1917
In the following years of his discovery, artificial fever was induced by any one of the following methods: the introduction into the patient of a parasitic disease; the injection of a foreign protein; injections of chemical substances such as sulphur; electrical means such as the administration of diathermy or radiotherapy, or placing the patient in an electromagnetic field; and simple **immersion of the individual in a hot bath, or placing him in a heat cabinet.** Wagner Jauregg's therapy was highly admired and was used on neurosyphilis cases well onto the 1950's. However, with the introduction of penicillin in syphilis' treatment, fever therapy effectively ended.

DR. RUBLE 1919

Life and Health | May 1, 1919

campers. Of those who had pneumonia 40 per cent died, or 1 1-3 per cent of the camp inhabitants were taken by death through influenza and pneumonia.

Considering the number of cases of influenza only, there were 16 2-3 per cent that had pneumonia. Two fifths of these, or 6 2-3 per cent of all influenza cases, died of pneumonia.

It may be of interest to our readers to know the result of treatment of influenza in sanitariums. During the first wave of this epidemic this journal sent out question blanks asking for reports of the treatment of these cases in hydrotherapeutic sanitariums, and by these sanitarium methods in adjacent communities. Ten sanitariums have reported 1,123 cases of influenza treated, 446 of which were among the nurses, employees, and regular patients of the institutions, and 677 in adjacent communities.

Of the 677 cases treated outside, 55, or about 9 per cent, had pneumonia, many of them having the disease well established when received under sanitarium care. These 55 persons outside compose about 6 per cent of all the cases treated. Of these 55 cases of pneumonia treated as out-patients 26 died. That is, approximately 4 per cent of influenza cases treated outside died, and these constituted 2.37 per cent of the entire number treated.

Of the entire 1,123 influenza patients treated, 11, or 1 per cent, of those who had been under sanitarium care from the beginning of the disease, had pneumonia, and 6 cases, or 1-2 per cent, died of pneumonia and other complications. All out-patients received the same treatment as in-patients, as far as possible. This speaks well for the sanitarium system of treatment and care.

The principal merit, as far as treatment was concerned, was placed in careful nursing and hydrotherapeutic remedies. W. A. Ruble, M. D.

Army Hospital n = ?	Sanitaria (10) n=446
17% got PNA	2.5% got PNA
40% of PNA died	55% of PNA died
Overall = 6.4%	Overall = 1.3%

Sauna

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Regular Sauna Bathing and the Incidence of Common Colds

E. Ernst, E. Pecho, P. Wirz & T. Saradeth

To cite this article: E. Ernst, E. Pecho, P. Wirz & T. Saradeth (1990) Regular Sauna Bathing and the Incidence of Common Colds, Annals of Medicine, 22:4, 225-227, DOI: 10.3109/07853899009148930

To link to this article: https://doi.org/10.3109/07853899009148930

N = 50 – Prospective trial for 6 months
-1) N=25 sauna baths 1-2 times per week
-2) N=25 control – nothing of the sort

Intervention group had **half** the number of colds (9 versus 23) – $p < 0.01$ in the second half of the 6 month period. The distribution of frequencies was similar both groups, indicating that it was not just a few people who accounted for the group differences."

RESEARCH ARTICLE

The Effect of Cold Showering on Health and Work: A Randomized Controlled Trial

Geert A. Buijze[1]*, Inger N. Sierevelt[2], Bas C. J. M. van der Heijden[3], Marcel G. Dijkgraaf[4], Monique H. W. Frings-Dresen[5]

1 Department of Orthopaedic Surgery, Academic Medical Center, Amsterdam, The Netherlands, **2** Department of Orthopaedic Surgery, Medical Center Slotervaart, Amsterdam, The Netherlands, **3** Risk Management, Achmea, Zeist, The Netherlands, **4** Clinical Research Unit, Academic Medical Center, Amsterdam, The Netherlands, **5** Department Coronel Institute of Occupational Health, Academic Medical Center, Amsterdam, The Netherlands

* g.a.buijze@amc.nl

Methods

Between January and March 2015, 3018 participants between 18 and 65 years without severe comorbidity and no routine experience of cold showering were randomized (1:1:1:1) to a (hot-to-) cold shower for 30, 60, 90 seconds or a control group during 30 consecutive days followed by 60 days of showering cold at their own discretion for the intervention groups. The primary outcome was illness days and related sickness absence from work. Secondary outcomes were quality of life, work productivity, anxiety, thermal sensation and adverse reactions.

Results

N = 3018 for 1 month

79% of participants in the interventions groups completed the 30 consecutive days protocol. A negative binomial regression model showed a 29% reduction in sickness absence for (hot-to-) cold shower regimen compared to the control group (incident rate ratio: 0.71, P = 0.003). For illness days there was no significant group effect. No related serious advents events were reported.

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Contents lists available at ScienceDirect

Respiratory Medicine

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

Short communication

Frequent sauna bathing may reduce the risk of pneumonia in middle-aged Caucasian men: The KIHD prospective cohort study

Setor K. Kunutsor[a,*], Tanjaniina Laukkanen[b], Jari A. Laukkanen[b,c]

[a] Translational Health Sciences, Bristol Medical School, University of Bristol, Learning & Research Building (Level 1), Southmead Hospital, Southmead Road, Bristol, UK
[b] Institute of Public Health and Clinical Nutrition, University of Eastern Finland, Kuopio, Finland
[c] Central Finland Central Hospital, Department of Internal Medicine, Jyväskylä, Finland

Prospective study N = 2210 Men

Follow up 25.6 years

375 Hospital based cases of pneumonia in Finland

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Short communication

Frequent sauna bathing may reduce the risk of pneumonia in middle-aged Caucasian men: The KIHD prospective cohort study

S.K. Kunutsor et al.

Respiratory Medicine 132 (2017) 161–163

Table 1
Association of frequency of sauna bathing and risk of incident pneumonia.

Frequency of sauna bathing (times/week)	Events/ Total	Model 1		Model 2		Model 3	
		HR (95% CI)	*P*-value	HR (95% CI)	*P*-value	HR (95% CI)	*P*-value
≤1	119/579	ref		ref		ref	
2–3	234/1441	0.67 (0.53–0.83)	< 0.001	0.69 (0.55–0.86)	0.001	0.72 (0.57–0.90)	0.007
≥4	22/190	0.53 (0.34–0.84)	0.007	0.56 (0.35–0.88)	0.013	0.63 (0.39–1.00)	0.049
P-value for trend			0.0001		0.0004		0.0034

CI, confidence interval; HR, hazard ratio; ref, reference.
Model 1: Adjusted for age.
Model 2: Model 1 plus body mass index, smoking status, history of diabetes, prevalent coronary heart disease, history of asthma, history of chronic bronchitis, history of tuberculosis, years of education, total cholesterol, and alcohol consumption.
Model 3: Model 2 plus total energy intake, socioeconomic status, physical activity, and C-reactive protein.

SUMMARY

Working Hypothesis:

Heat followed by cold improves innate immunity significantly enough to reduce actual diseases such as colds from viral infections, severity of illnesses, and even pneumonias admitted to the hospital – many more studies

COVID-19?

FINLAND AND SAUNAS & COVID 19

5.5 million people in Finland

3.3 million saunas in Finland

>99% of population has sauna bath ≥1x per week

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https://www.worldometers.info/coronavirus

Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop
World	1,430,919	+84,915	82,034	+7,380	301,905	1,046,980	47,913	184	10.5		
USA	400,335	+33,331	12,841	+1,970	21,674	365,820	9,169	1,209	39	2,075,739	6,271
Spain	141,942	+5,267	14,045	+704	43,208	84,689	7,069	3,036	300	355,000	7,593
Italy	135,586	+3,039	17,127	+604	24,392	94,067	3,792	2,243	283	755,445	12,495
France	109,069	+11,059	10,328	+1,417	19,337	79,404	7,131	1,671	158	224,254	3,436
Germany	107,663	+4,288	2,016	+206	36,081	69,566	4,895	1,285	24	918,460	10,962
China	81,740	+32	3,331		77,167	1,242	211	57	2		
Iran	62,589	+2,089	3,872	+133	27,039	31,678	3,987	745	46	211,136	2,514
UK	55,242	+3,634	6,159	+786	135	48,948	1,559	814	91	266,694	3,929
Turkey	34,109	+3,892	725	+76	1,582	31,802	1,474	404	9	228,868	2,714
Switzerland	22,253	+596	821	+56	8,704	12,728	391	2,571	95	167,429	19,346
Belgium	22,194	+1,380	2,035	+403	4,157	16,002	1,260	1,915	176	80,512	6,947
Netherlands	19,580	+777	2,101	+234	250	17,229	1,424	1,143	123	86,589	5,053

COVID-19 in Nordic Countries

	USA	Denmark	Norway	Sweden	Finland
Population	327 M	5.6 M	5.4 M	10.2 M	**5.5 M**
Cases	532,879	5,996	6,409	10,151	**2,905**
Deaths	20,577	260	119	887	**49**
Cases/M	1,610	1,035	1,182	1,005	**524**
Deaths/M	62	45	22	88	**9**
First Case	19 Jan	27 Feb	26 Feb	4 Feb	**29 Jan**
UW Peak Deaths/d	1,983	22	24	134	**8**
Restrictions	Schools closed Stay at home Non essential closed Travel Limited?	Schools closed	Schools closed Stay at home Non essential closed		**Schools closed** **Non essential closed** **Travel limited**
Testing/M	8,068	11,700	22,924	5,416	**8,005**

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HYDROTHERAPY EVIDENCE

Cellular

Individuals with Diverse Diseases

Populations with COVID-19

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

HCP use of homemade masks:

In settings where facemasks are not available, HCP might use homemade masks (e.g., bandana, scarf) for care of patients with COVID-19 as a last resort. However, homemade masks are not considered PPE, since their capability to protect HCP is unknown. Caution should be exercised when considering this option. Homemade masks should ideally be used in combination with a face shield that covers the entire front (that extends to the chin or below) and sides of the face.

The Good is not the enemy of the Perfect:

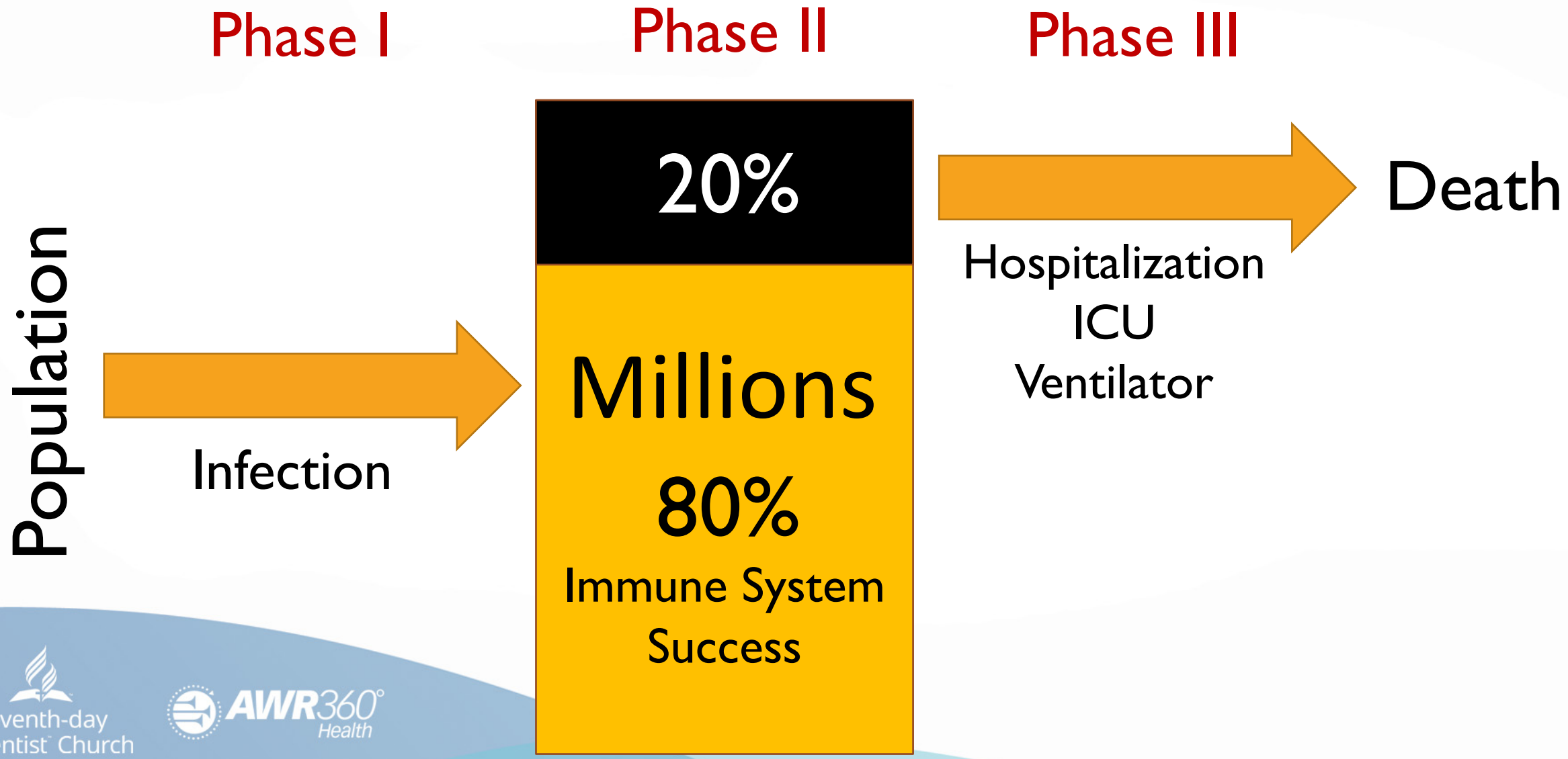
There is no FDA approved medication or treatment for COVID-19

There are many therapeutics that are being looked at and some are very promising

Regardless of whatever medication comes to market either now or later there will be a shortage of this medication (i.e. hydroxychloroquine, azithromycin)

Physicians are using everything at their disposal right now even if we don't have all the perfect evidence to use it: - "compassionate use"

COURSE OF THE DISEASE



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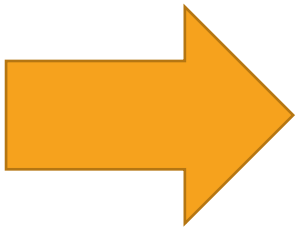
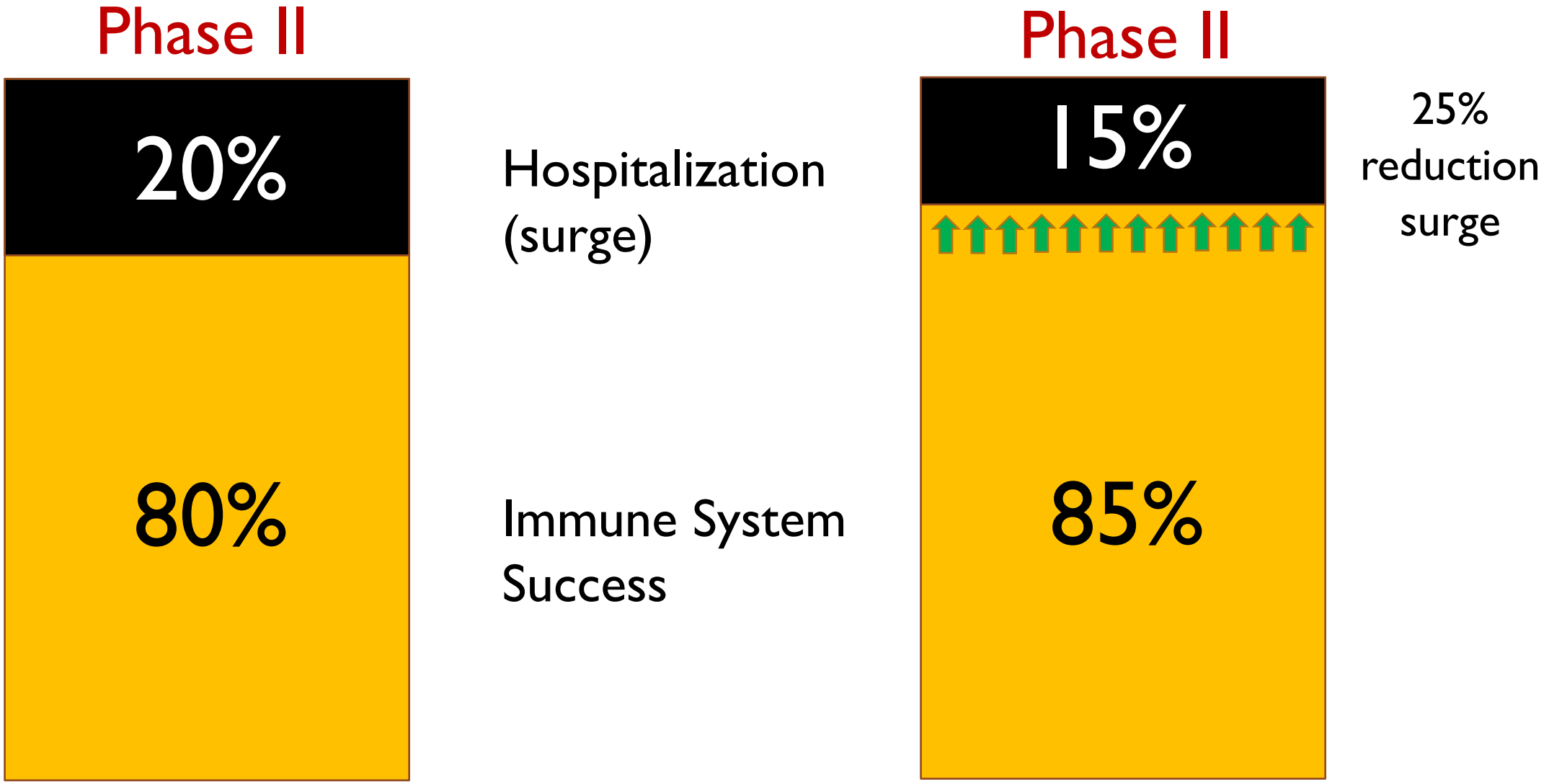
Call to Action



	It WORKS	It doesn't work
DO IT	+	-
Don't do it	-	+

COURSE OF THE DISEASE



CHARACTERISTICS OF AN IMMEDIATE PHASE II INTERVENTION

Complementary with current medical care

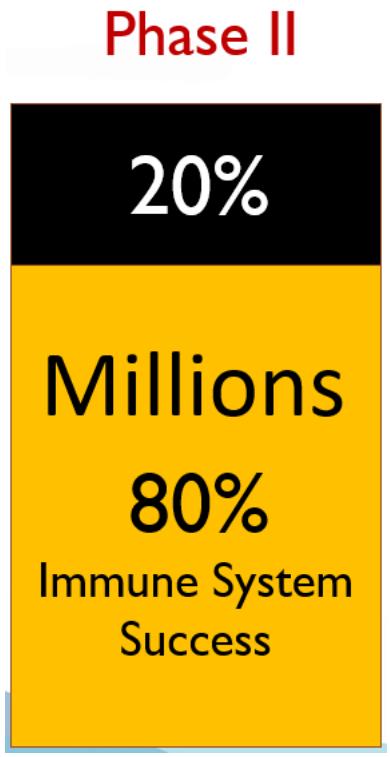
Scalable to millions of people right away

Does not require test or doctor visit or pharmacy visit

Not dependent on needing treatment to be produced or delivered

Easily accessible at home, prison, refugee camps in all countries

Minimal side-effects



Risk versus Benefits

What are the other alternatives?

How long will they take?

In the last 90 minutes another 381 people around the world have died from COVID-19

Hydrothermal Therapy

Using Water to Apply Heat and Cold

John Kelly, MD, MPH
Lifestyle Medicine Specialist

Four phases of COVID-19 interventions

1. Pre-infection **prevention**	Lifestyle interventions, **contrast showers**, saunas
2. Presumed or confirmed early infection **outpatient treatment**	Intensive lifestyle interventions, **hot fever baths**, **moist heat packs**, steam baths
3. Confirmed late infection **inpatient treatment**	**Fomentations**, hyperthermia
4. Severe disease **ICU treatment**	**Hyperthermia**

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Life & Health

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CONTENTS OF THIS ISSUE

SUBSCRIPTION RATES.— One year, $1; six months, 60 cents. Remit by Post Office Money Order (payable at Washington, D. C., post office), Express order, or Draft on New York. Cash should be sent in Registered Letter. When a change of address is desired, both old and new addresses must be given. No extra charge to foreign countries.

Hot foot bath under bed covers warms subject

Wrap moist heat packs in thick towels to avoid burning

Hydrothermal moist heat pack (*fomentation*)

- Subject lying on back with plenty of covers – keep warm!
- Hot foot bath 104-110°F (≤104°F for diabetes or neuropathy)
- Apply cold terrycloth to head – keep head cool!
- Hot moist heat to chest – wrap heat packs in towels to avoid burning skin
- Place wrapped heat pack under spine, from nape to pelvis
- Place one across the chest and cover subject with blankets

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Hydrothermal moist heat pack (*fomentation*)

- Replace top fomentation every 4-5 minutes, rub chest with cold terrycloth between exchanges
- Continue 3-4 exchanges, or until profuse perspiring – keep head cool!
- End with cold terrycloth rub to chest and cover with blankets
- Pour cold water over feet and remove foot bath
- Continue cold to head until perspiring subsides
- Bed rest

Hydrothermal hot tub bath

- Hot tub bath (104-110°F) with cold to head (ice water)
- Continue <30 minutes or until profuse perspiring
- Full body cold mitten rub
- Warm clothing (sweats) and blanket wrap in bed
- Continue cold to head until perspiring subsides
- Optional brief neutral shower
- Bed rest

Hydrothermal Therapy

- Hyperthermia induces ‘fever-like’ immune response
- Begin therapy vigorously as early as possible, with first symptoms
- Repeat once or twice a day
- Follow all Lifestyle Medicine health principles rigorously (diet, exercise, sleep, resilience, stress, connectedness)

Hydrothermal Training Course

- Zoom-based course teaches the most up-to-date understanding of the practical use of key hydrothermal therapy treatments in the setting of lifestyle and whole-person care.
- Students submit individual work and videos of themselves practicing with their training partner.

HydrotherapyTrainingCourse@gmail.com

JHKelly@CLNF.org

Inpatient Hydrothermal Therapy

Eric Nelson, MD, FACS, FASCRS

Feasibility Case-Control Study

- Protocol
  - 25min heat
  - 1-2min cold (“thermal lock”)
  - 4x/day
- Monitoring
- Goals

- Exclusion criteria
  - Arrhythmias, pregnancy, HScore>169
- Primary Outcomes
  - LOS/Dispo, Oxygenation
- Collaboration?
  - enelson06m@yahoo.com

	Number of points
Temperature	
<38·4°C	0
38·4–39·4°C	33
>39·4°C	49
Organomegaly	
None	0
Hepatomegaly or splenomegaly	23
Hepatomegaly and splenomegaly	38
Number of cytopenias*	
One lineage	0
Two lineages	24
Three lineages	34
Triglycerides (mmol/L)	
<1·5 mmol/L	0
1·5–4·0 mmol/L	44
>4·0 mmol/L	64
Fibrinogen (g/L)	
>2·5 g/L	0
≤2·5 g/L	30
Ferritin ng/ml	
<2000 ng/ml	0
2000–6000 ng/ml	35
>6000 ng/ml	50
Serum aspartate aminotransferase	
<30 IU/L	0
≥30 IU/L	19
Haemophagocytosis on bone marrow aspirate	
No	0
Yes	35
Known immunosuppression†	
No	0
Yes	18

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COVID-19

What we KNOW…

What We Don’t Know!

Zeno L Charles-Marcel, MD
Assoc. Professor of Medicine (Adj)
Loma Linda University

Case 1

70 y/o man, 11 day hx of fever, and delirium, influenza, now he was unconscious; temperature 103° F, 39.4° C.

Doughy pitting of the neck, with red, inflamed throat like a streptococcus sore throat.

The left lung showed an inflammatory edema of the bronchial-pneumonia type in distribution, with less notable involvement on the right.

His physician had become ill and had left, but had given the patient's daughter the opinion that undoubtedly death would occur within two days.

Case 1 (Continued)

A nurse applied the treatments (combined treatment regimen as outlined for Pandemic pneumonia) at 4 P. M., with no discoverable change in his condition.

At the eight o'clock am visit of the physician, the patient was conscious with no delirium

Treatment was repeated twice a day with alternate hot and cold to the throat added

In two days the throat and neck condition disappeared..

Complete recovery took a week. **What produced this outcome?**

Case 2

- A 30 y/o woman, ill four days in the 1918 pandemic of Spanish influenza, with nothing done for her
- Temperature 105° F, 40.6° C. She was delirious and became unconscious, with large areas on her back of the dull, red, congested skin as in persons dying of circulatory failure.
- There were the shifting crepitant râles in the lungs mostly over the back, and much worse on the dependent side, yet without definite consolidation as in seen in severe influenza with early pneumonia.

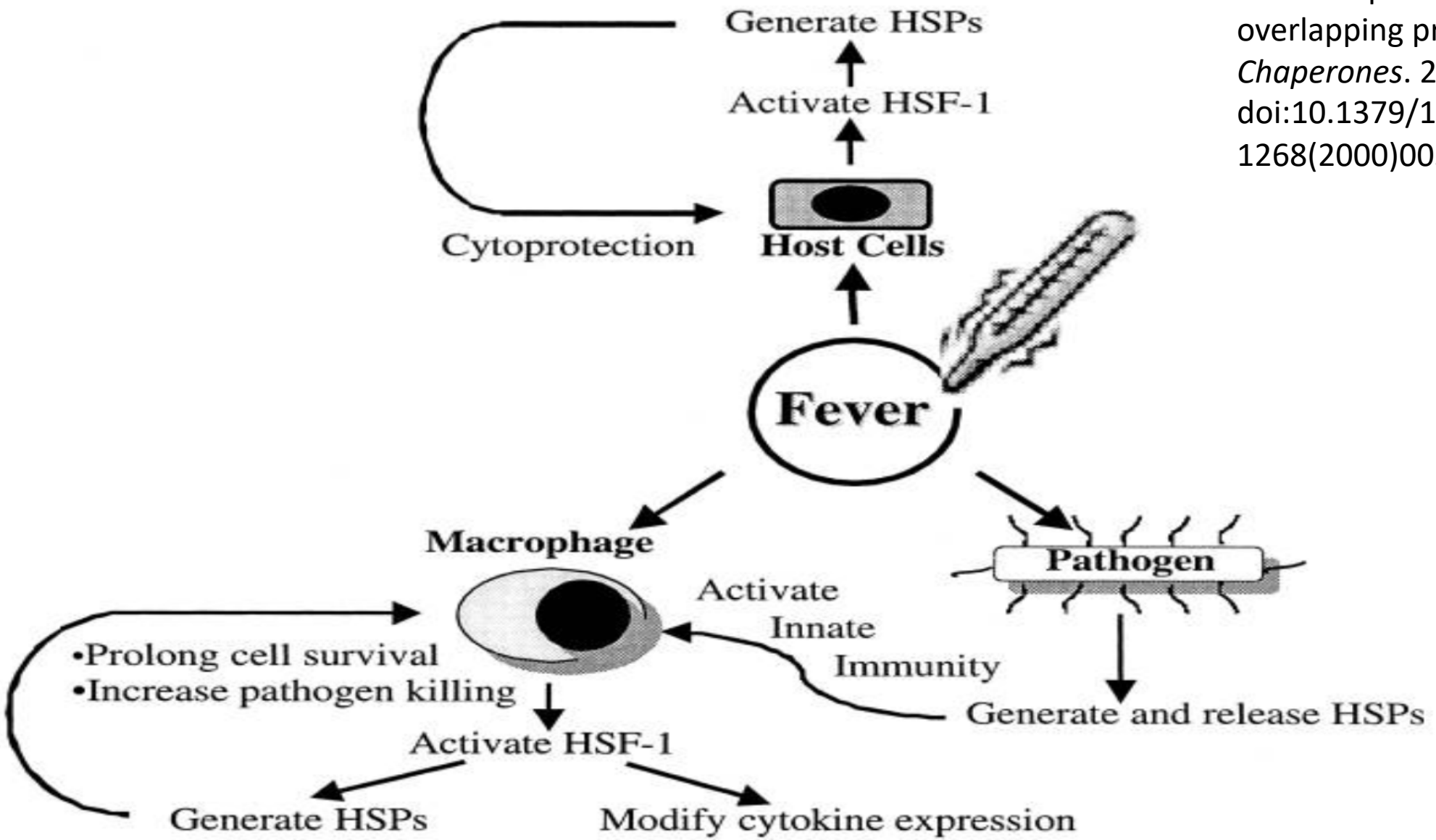
Case 2

- Quickly applied hot foot bath, with fomentations (hot packs) to the chest, front and back, intimately combined with the “cold-mitten friction”, was given twice a day
- Two days of treatment seemed nearly unavailing, but full consciousness with clear mind returned the third day, and the temperature reached normal after five days of treatment
- She survived! **What produced this outcome?**

Anecdotal cases:

- What don’t we know:
  - How many had that outcome?
  - How many were treated?
  - What else could have confounded the results?
  - Was the diagnosis established?
  - Was this found in different centers?
  - Did they all use the same protocol and get similar outcomes?
  - Is there a plausible explanation for the conclusion it was hydrothermal therapy the principal treatment to produce the outcome?
  - Were they all treated indoors? Outdoors?
  - Did they have sun exposure?
  - If it happened with H1N1 Influenza will it happen with SARS-CoV-2?
  - Etc.

Proposed Interactions between Fever and Heat Shock Response



Hasday JD, Singh IS. Fever and the heat shock response: distinct, partially overlapping processes. *Cell Stress Chaperones*. 2000;5(5):471–480. doi:10.1379/1466-1268(2000)005<0471:fathsr>2.0.co;2

Hydrothermal Therapy: What we have

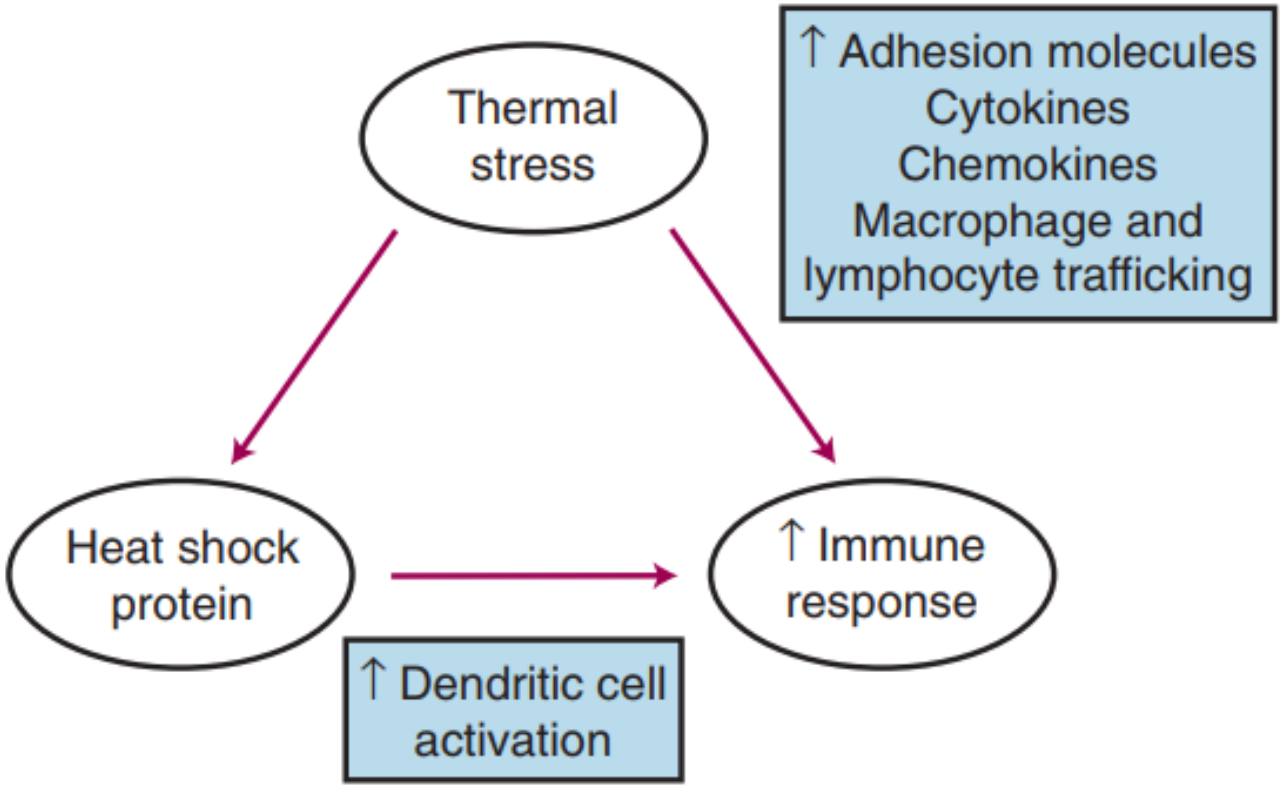


Figure 21-4 Summary of known beneficial immunological effects of mild temperature hyperthermia.

Fever
Fever-range hyperthermia (38.5-41^{o} C)

Both induce HSP Response

Repasky EAGE: Biomedical applications of heat shock proteins and thermal stress.
Int J Hyperthermia 29:359–499, 2013.

Heat shock proteins and immunity: Application of hyperthermia for immunomodulation.
https://www.tandfonline.com/doi/full/10.3109/02656730903315831

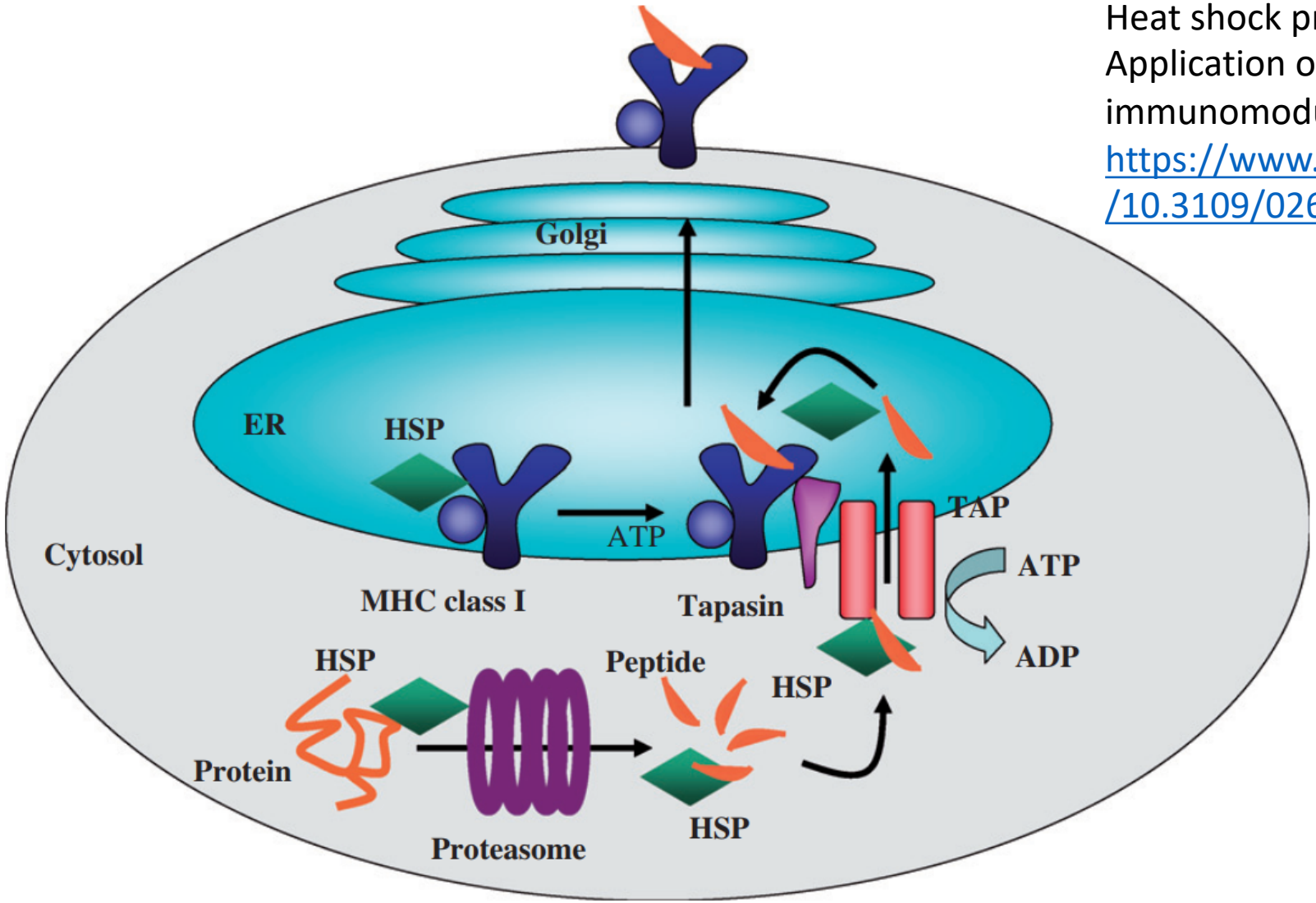


Figure 1. The role of intracellular HSPs in MHC class I antigen presentation. Cellular proteins are degraded by proteasomes, resulting in production of antigenic peptides. The peptides are transported from the cytosol into the endoplasmic reticulum (ER) by transporters associated with antigen processing (TAP), followed by binding to MHC class I molecules and presentation on the cell surface. Molecular chaperone HSPs are associated with antigenic peptides, proteasomes, TAP and MHC class I in this pathway.

Heat shock proteins and immunity: Application of hyperthermia for immunomodulation. https://www.tandfonline.com/doi/full/10.3109/02656730903315831

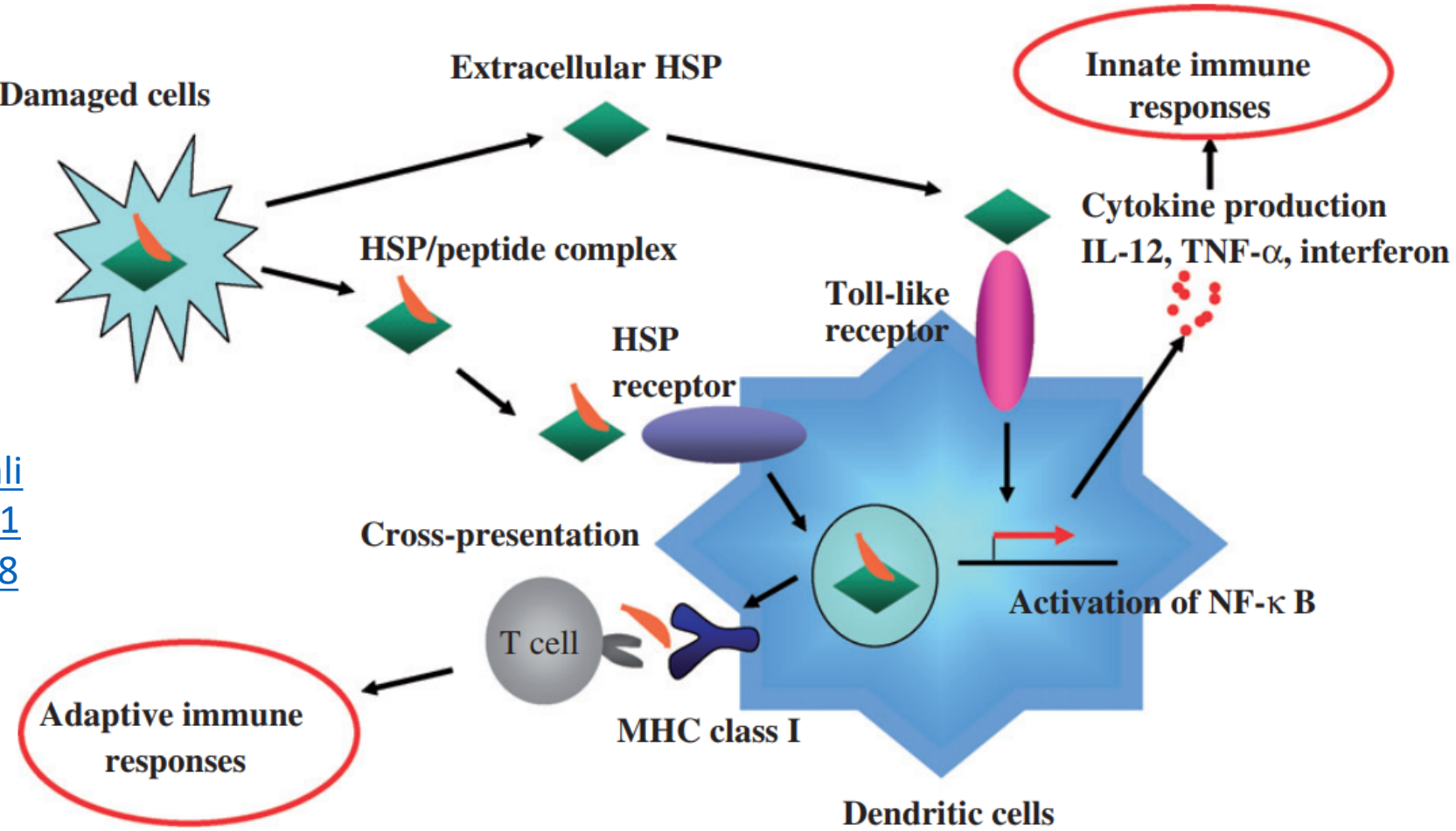
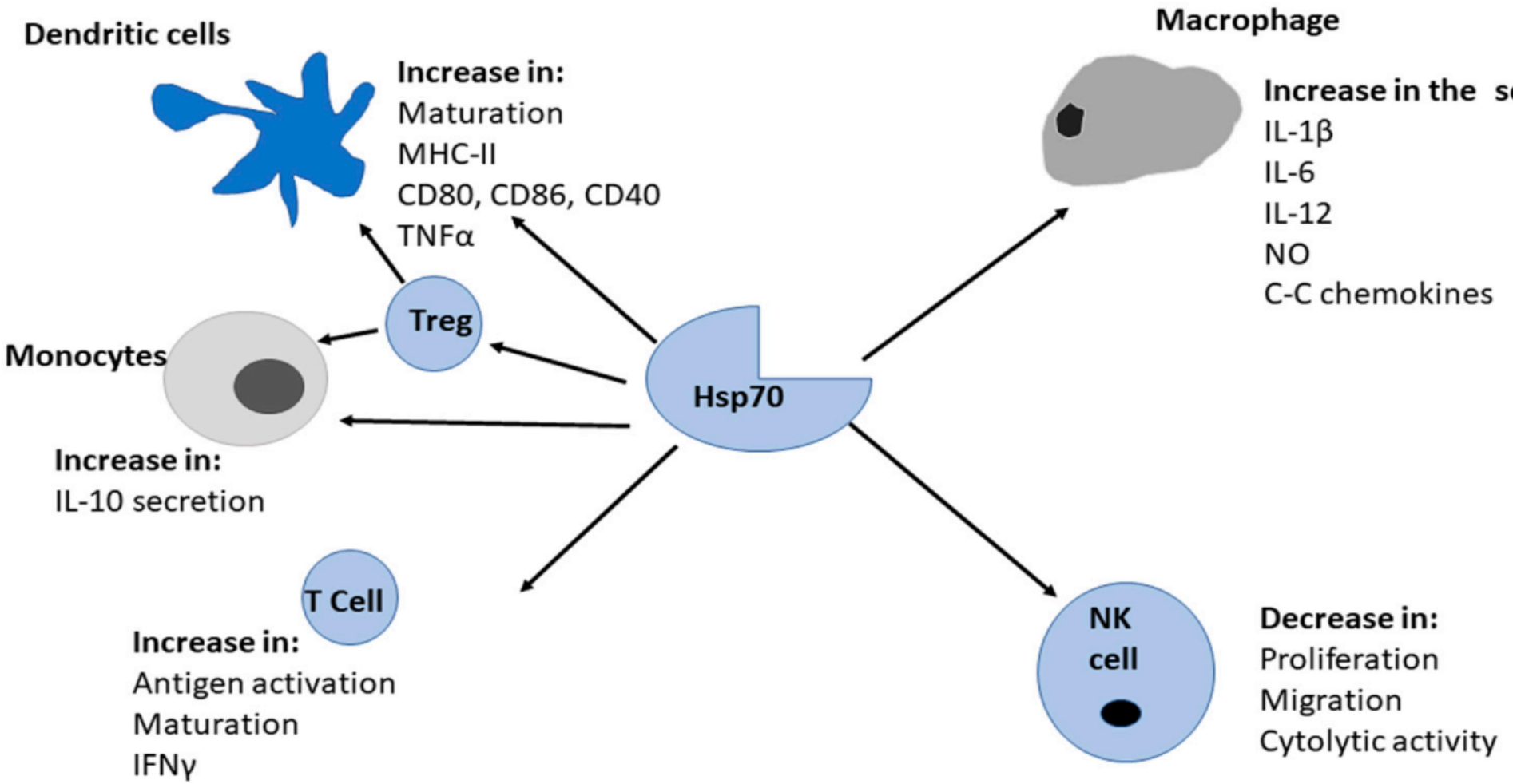


Figure 2. The role of extracellular HSPs in immune responses. Extracellular HSPs can stimulate Toll-like receptors, leading to activation of dendritic cells and release of cytokines such as IL-12, TNF-α and interferon (innate immune responses). Extracellular HSPs can be internalised through HSP receptors with HSP-bound peptides. The antigenic peptides are then cross-presented to MHC class I molecules, leading to induction of peptide-specific CTL responses (adaptive immune responses).



Zininga T, Ramatsui L, Shonhai A. Heat Shock Proteins as Immunomodulants. *Molecules*. 2018;23(11):2846. Published 2018 Nov 1. doi:10.3390/molecules23112846

Figure 3. Hsp70s stimulation of immunity. Hsp70 stimulates both the innate and adaptive immune systems. The recognition of Hsp70 by immune cells causes initiation of signal transduction which results in the subsequent release of cytokines.

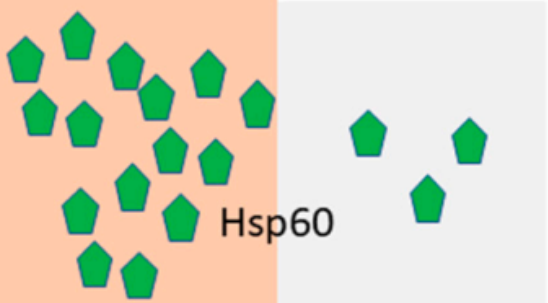
Pro-inflammatory

Dendritic cells

Increase in:
antigen presentation
Dendritic cell survival

Macrophage

Increase in:
IL-6
IL-12
IL-15
IFNα
TNFα



HIGH **LOW**
Hsp60 concentration

Anti-inflammatory

T regulatory cells
Increase in:
IL-4
IL-10
TGFβ1

B cell
Increase in:
IL-6
IL-10

Effector T cell
Increase in:
IL-10
TNFα
IFNγ

Zininga T, Ramatsui L, Shonhai A. Heat Shock Proteins as Immunomodulants. *Molecules*. 2018;23(11):2846. Published 2018 Nov 1. doi:10.3390/molecules 23112846

Dose response and Hormesis

Hydrothermal Therapy: What we don't have

- Scientific evidence that hydrothermal therapy was really the factor that saved the lives of so many during the 1918 flu pandemic
- Specific BBPC studies showing that hydrotherapy is effective in preventing or treating COVID-19
- BBPC studies showing that SARS-COV-2 specifically wipes out the human immune defenses at the level of the innate response
- How to stimulate a particular HSP at a specific concentration

Hydrothermal Therapy: What we don't have

- Direct scientific analyses that demonstrate that SARS-COV-2 acts or will act just like H1N1 (1918)
- Demonstration that heat applied by any method will have similar results
- Direct evidence that hydrothermal therapy as we suggest it be applied will affect the host immune system just as we predict and hope it will.

In Summary

- **Researchers and medical professionals are racing to find a pharmaceutical solution and create a vaccine.**
- **Hx, Plausibility, molecular mechanisms, indirect evidence**
- **Hydrothermal therapy is rel. low-risk, adjunctive lifestyle measure to practice. It is not a panacea .**
- **While future hydrothermal therapy research is needed, in the meantime, hydrothermal therapy probably won't hurt* and it may help**
- **While we search for definitive solutions, What do we have to lose?**

* Heat may increase HIV replication and some evidence for suppression of innate immunity