2020 APRIL 26 MMI EMAIL which I sent this evening

Dr. Liegner, thank you for your regular contributions to these pages which I have enjoyed reading over the years. Thank you, Dr. Bransfield, for keeping this listserv going, and for your contributions. I do not keep up with all the posts on a regular basis, but have been reading them more regularly in recent weeks while "sheltering."

The comments below on UV light therapy and ozone caught my attention, therapies with which I do have some familiarity.

Let us recall that we studied physics as a prerequisite course for medical school, and biophysics in the first year of medical school (required in my 1st year, at least). However, physics was thrown out the window when it came to therapeutics. The biochemical model has prevailed as our therapies spring from our level of understanding and we have defined essentially all there is to know about the cell biochemically. In spite of this, and under the best of circumstances, biochemical manipulation often fails, whether through drugs, supplements or herbs. Taking HTN as an example, part of the bread and butter of out-patient medicine, looking at the research:

- A 2006 Canadian study found that 42% of patients in a study group 185 medicated patients achieved control. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2718609/
- A 2016 Lancet study looking at a population over age 80 of 874 treated patients versus 796 controls, and found 34% reduction in risk of stroke, but not benefit with respect to cardiovascular death or all-cause mortality. https://www.sciencedirect.com/science/article/pii/S0140673698081276

This is not to decry drug therapy for HTN, but rather to just make the point that some fail the therapy. The percentages vary considerably between studies on antihypertensive therapy, according to trial design and agent used. The effort is laudable. Even when compliance succeeds, but therapy fails, or causes undesired complications, we are not collectively taken to task for prescribing an antihypertensive but the patient still dies of a heart attack. We are exculpated because we prescribed a therapy which is approved by medical and public health orthodoxy. Those approvals come at high cost. As an example:

- https://www.ahajournals.org/doi/10.1161/hypertensionaha.111.177766 Between 1981 and 2007, NHLBI annual support for hypertension-related research progressively increased from $80.6 million to $211.1 million. NHLBI support for years 2008, 2009, and 2010 was $167.4, $169.8, and $147.7 million, respectively. In part, a change in National Institutes of Health–wide methodology for calculating dollars associated with a particular disease may have contributed to the apparent funding decrease in 2008–2010. [These figures do not take in to account corporate pharmaceutical dollars spent over the same period of time.]

This comes back to the old refrain that there is little support for research in to therapies which are out of patent or which do not promise big profits to big industry.

With respect to UV light therapy:
Happily, we are entering an era where applied physics is meeting theoretical physics in the development of diagnostic and therapeutic technologies which are capable of assessing theoretical assumptions about biophysics.

- There is a considerable body of research, albeit much of it theoretical, on its potential benefit to systemic diseases. Some references below:
  - https://www.sciencedirect.com/science/article/pii/S120197121500140X International Journal of Infectious Diseases
    Volume 37, August 2015, Pages 58-63
    The treatment of infectious disease with a medical device: results of a clinical trial of ultraviolet blood irradiation (UVBI) in patients with hepatitis C infection
    Author links open overlay panelJ. ToddKuenstner[ab]ShankerMukherjee[c]StuartWeg[d]TrishLandry[e]Thomas Petrie[f]
  - https://academic.oup.com/cid/article-abstract/5/1/92/438793 A chimpanzee study. β-Propiolactone/Ultraviolet Irradiation: A review of Its Effectiveness for Inactivation of Viruses in Blood Derivatives Alfred M. Prince, Wolfgang Stephan, Betsy Brotman *Reviews of Infectious Diseases*, Volume 5, Issue 1, January 1983, Pages 92–107, https://doi.org/10.1093/clinids/5.1.92 Published: 01 January 1983 The most recent data suggest that βPL/UV can

reduce the titer of hepatitis B virus about 10 million fold (10^{-7}) . The process efficacy for βPL/UV followed by the special adsorption procedures used in preparation of a stabilized human serum containing most human serum proteins except for factor VIII, the factor IX complex, fibrinogen, and the lipoproteins was estimated as a 10^{8}-fold reduction in virus titer.

- Michael Hamblin PhD, widely considered to be the leading authority west of the Suez on photobiomodulation, is the Director of the Wellman Center for Photomedicine at Harvard/MGH within the department of Dermatology. He bemoans the lack of funding and general lack of support (or lack of courage?) within the medical establishment to do research on systemic applications of photodynamic therapy, including UV blood irradiation. Nonetheless, some of these studies can be cited:

    - https://pubs.rsc.org/en/content/articlelanding/2004/pp/b311900a/unauth#!divAbstract Photodynamic therapy: a new antimicrobial approach to infectious disease? Issue 5, 2004 Photochemical & Photobiological Sciences
      Michael R. Hamblin*ab and Tayyaba Hasanab
      "All the available evidence suggests that multi-antibiotic resistant strains are as easily killed by PDT as naïve strains, and that bacteria will not readily develop resistance to PDT. Treatment of localized infections with PDT requires selectivity of the PS for microbes over host cells, delivery of the PS into the infected area and the ability to effectively illuminate the lesion. Recently, there have been reports of PDT used to treat infections in selected animal models and some clinical trials: mainly for viral lesions, but also for acne, gastric infection by *Helicobacter pylori* and brain abcesses. Possible future clinical applications include infections in wounds and burns, rapidly spreading and intractable soft-tissue infections and abscesses, infections in body cavities such as the mouth, ear, nasal sinus, bladder and stomach, and surface infections of the cornea and skin."
        - https://pubs.rsc.org/en/content/articlelanding/2004/pp/b311903n/unauth#!divAbstract Issue 5, 2004 Mark Wainwright[a] Photoinactivation of viruses

The use of photodynamic therapy to treat viral infections has never really gained clinical acceptance, despite the fact that the technique is some 70 years old. However, the development of alternative photosensitisers could mean that there is an application for this technique in the disinfection of blood products.

- 10 February 2006Mechanisms of low level light therapy
  Michael R. Hamblin; Tatiana N Demidova
  Author Affiliations +
  Proceedings Volume 6140, Mechanisms for Low-Light Therapy; 614001 (2006) https://doi.org/10.1117/12.646294
  Event: SPIE BiOS, 2006, San Jose, California, United States
  Mitochondria are thought to be a likely site for the initial effects of light, leading to increased ATP production, modulation of reactive oxygen species and induction of transcription factors. These effects in turn lead to increased cell proliferation and migration (particularly by fibroblasts), modulation in levels of cytokines, growth factors and inflammatory mediators, and increased tissue oxygenation.

- Let it be noted as well that bioluminescence, the light emission associated with biochemical reactions in the human cell, is no longer merely theoretical, but was demonstrated under observation by Fritz Popp, PhD in physics, in 2003: "For the first time systematic measurements of the "ultraweak" photon emission of the human body (biophotons) have been performed by means of a photon detector device set up in darkness. About 200 persons have been investigated. In a particular case one person has been examined daily over several months. It turned out that this biophoton emission reflects,(i) the left-right symmetry of the human body ; (ii) biological rhythms such as 14 days, 1 month, 3 months and 9 months: (iii)disease in terms of broken symmetry between left and right side; and (iv) light channels in the body, which regulate energy and information transfer between different parts. The results show that besides a deeper understanding

> of health, disease and body field, this method provides a new powerful tool of non-invasive medical diagnosis in terms of basic regulatory functions of the body."

Of further interest is that, perhaps for the first time since 1947, a trial of UV light therapy to the treatment of systemic disease was just initiated at Cedar-Sinai last week to treat COVID-19. This is a new application via respiratory route and you can read about it here:
https://apnews.com/b44f4531071e6204023f7b8e16f59d4b
"Led by Mark Pimentel, MD, the research team of the Medically Associated Science and Technology (MAST) Program at Cedars-Sinai has been developing the patent-pending Healight platform since 2016 and has produced a growing body of scientific evidence demonstrating pre-clinical safety and effectiveness of the technology as an antiviral and antibacterial treatment. The Healight technology employs proprietary methods of administering intermittent ultraviolet (UV) A light via a novel endotracheal medical device. Pre-clinical findings indicate the technology's significant impact on eradicating a wide range of viruses and bacteria, inclusive of coronavirus."

With respect to ozone therapy, there is a compelling body of theoretical research in the world scientific literature, as well as a growing body of research to support its validity and therapeutic benefit. This is essentially all foreign research, much coming out of Spain, Italy and Germany. As with any therapy, there are important considerations with respect to dosing and frequency of treatment. Where relapses are concerned, there may be a need to cycle therapy in the same way that antibiotics have been cycled in a number of clinical circumstances (COPD, chronic UTIs, others). For the first time ever, a few hospitals in Italy and Spain have opened their doors to ozone therapy as part of research protocols in very recent weeks due to the desperate circumstances in their hospitals due to the pandemic. There is virtually no attention being given to this in the American media. It did make headlines in the papers in the north of Italy and in Spain as the initial results showed very significant promise. The hospital in Udine, Italy is treating one group of 45 with antivirals and chloroquine, and the study group of 45 with antivirals, chloroquine, and ozone. The resolution seen in the ozone group has been far greater than in the controls, first 35 of 36 treated discharged to home.

As far as charges for UV and ozone therapy are concerned, I don't know what people are charging across the country. In NYS it is illegal for doctors to discuss fees with each other. However, it is my experience and impression that the doctors who are pushing the envelope on complementary therapies are often saving much less than if they had stayed on a hospital or health system payroll. The overhead for small generalist FP or internist practices in NYC is huge. I can't speak for the rest of the country. However, even in Kansas, when nursing costs, equipment costs, and other overhead is totaled, the profit may not be what is imagined. If the doctor down the road administering ozone and UV is doing a brisk business, most probably, it is because those patients feel that conventional therapies have failed them. Whether UV or ozone provide the breakthrough they are seeking, we won't know unless the research gets done. Where is that funding coming from?

Yes, beware of limitations of therapy. But does anyone here know a therapy without limitations? Is someone on this list achieving 100% success? It's an odds game, but when funding for getting good numbers is lacking, then what? We fall back on clinical intuition, personal experience with family, friends, patients, selves, observing what works, what doesn't, what makes sense. Crowd-sourcing through pooling patient data, such as MyLymeData is doing is another avenue to breakthroughs. If small physician practices can pool their data, that could be an important resource. But then the time to do the data entry, to analyze the data....

One of the questions foremost in my mind as we advance through this public health catastrophe is whether, as clinicians, we can use it to open our minds, to broaden the dialogue, to exchange ideas between clinical subcultures, specialties, institutions, and political persuasions, to place the patients, those who suffer, in the center of the circle, and have an open dialogue about what could work, what deserves to be tried, to be funded, to be studied, rather than dismissing new or unconventional approaches out of hand, or assuming that a vaccine is the only answer to this challenge.

I'll end with a brief clinical anecdote. I sent nasopharyngeal swabs on 9 patients in mid-March who had either had known contacts or were symptomatic. The only positive test was on a 90 y/o M, minimally symptomatic, now completely well, who had received the BCG in his 20s. The press on BCG's protective benefit seems to have largely died out this month. My small series holds no water, but it

would be nice if some of the most heavily affected hospitals paid underemployed doctors to do chart reviews on the COVID patients, cast a wide net, and look for common denominators predisposing to greater or lesser degrees of COVID-induced pathology.

Thanks for listening. All for now.
Claudia Cooke, MD, MPH

****

Above was in response to both posts below from a medical listserv on April 26, 2020:

Colleagues:

I have known about the process of ultraviolet light extracorporeal irradiation for some time. A local "Lyme-literate" clinic uses it all the time. Costs a fortune. If I were a better businessman, then I would start doing this in my clinic.

I don't get it....

You remove half a pint or a pint of blood. You then irradiate it. Then you put it back in the body. What has that accomplished? Other than relieving the patient of several hundred dollars?

1) Perhaps the pint of blood is now free of pathogens, but as soon as it mixes with the rest of the bloodstream, which is still filled with pathogens, that pint of blood becomes re-infected.

2) Perhaps some magical property has been endowed upon that pint of blood such that each white blood cell and each red blood corpuscle is now a Knight Templar which ride forth into the body killing pathogens right and left....doubtful.

What am I missing (other than a huge financial opportunity)???

TM, MD, PhD
Centennial CO

This is exactly what happened to me. I went to Mexico many years ago to have this done for Lyme and Bart, and I felt great for two months because my blood got cleaned up, etc....but slowly after that I started to have symptoms creep back in because the organisms I believe that were still living deep in the tissue , started to come out into the blood, etc...and the cycle started again. I was doing infrared saunas, coffee enemas, toxin binders, etc...all the while too.

I spent a lot of $$$$$$$ needless to say.

I think this therapy is a great way to cleanse the blood, but after that...I don't think it is that useful. I have seen over 100 patients have this done and some continue to pore money down this drain only to have symptoms return in a couple months. I have experienced the same and seen the same for ozone treatment. Lots of $$$$$$$$$. I do still have an in home ozonator though for my house because I think it keeps the air really clean.

Beware of the limitations of a therapy is the take home message I think.

SM, MD
Seattle, WA