

Can Face Masks Protect You From Aerosol Particles?

A Special Interview With Denis Rancourt

By Dr. Joseph Mercola

Dr. Joseph Mercola:

Welcome everyone, this is Dr. Mercola helping you take control of your health. And today we are joined by Denis Rancourt, Ph.D., who is a full professor of physics in Ottawa, Canada. And we're going to be discussing a very controversial topic, the use of face masks. And by controversial, I mean there's a really wide range of opinions on this even in people within the natural health community. We have individuals like Mike Adams from Natural News and Chris Masterson, Ph.D., from Peak Prosperity who are avid proponents of using face mask. And then of course as is most of the country, but here's another side to this equation. I was actually endorsing face masks myself and posted a video early in this, like in early March, probably early March, promoting the use of face masks based on the experience of some of the Eastern European countries.

Dr. Joseph Mercola:

And just the rational logic of it seemed to make sense at the time. But since then I have interviewed Judy Mikovits who was a strong opponent and did not recommend the use of masks for a variety of reasons that we'll discuss. So I want to tease through these details and Denis is one of the experts who has really studied this very carefully, even though he doesn't have a degree in biology. He's got a degree in physics, and I have enormous respect for [physicists]. I'm just enamored with their brain power to figure these aspects of reality out that require high level mathematics. Somewhat intimidated by the intellectual powers required to participate in that dialogue. But perhaps maybe the first place we can start is your background because some people might counter that you really have no formal training in biology, but you are a scientist, there's no question in studying physics. So tell us about your specific training and why you first became interested in this topic?

Denis Rancourt:

Yeah, I'd be glad to. So it's my pleasure to be on the show. First, I want to clarify, I'm not presently a full professor of physics at the University of Ottawa, that's my former position. I'm now a researcher at the Ontario Civil Liberties Association (OCLA). And I've been in that position, which is a volunteer position, since 2014. And it's given me the occasion to really get into some deep scientific issues that have an impact on civil rights.

Dr. Joseph Mercola:

For six years you've been doing that?

Denis Rancourt:

Yeah, that's right.

Dr. Joseph Mercola:

Wow. So what pays the bills for you though?

Denis Rancourt:

Well, there are no worries on that side, that's not a problem. But getting back to my background, it's true that my Ph.D. is in physics, my university degrees are in physics. But I did postdoctoral work in chemistry. I was in a big chemistry lab in France for my postdoctoral work. And I have been a very interdisciplinary [scientist]. When I was a full professor, I was actually cross appointed to supervise students in the earth and environmental sciences as well as in physics. And I was the lead researcher in my own laboratory and in some big research teams. And as lead researcher, I supervised postdoctoral fellows and graduate students in various disciplines, including biology and so on. So I was the boss of these teams, and they were very interdisciplinary teams. One of the large projects I ran was to study boreal forest lakes.

Denis Rancourt:

We looked at a hundred boreal forest lakes and their biochemistry, the water columns, their sediments and the sediment profiles. And we applied techniques, including microbe techniques. I've written papers on microbial interactions in the environment, important papers that have been well cited. So I know a lot of different areas of science. I'm a very interdisciplinary person, and I've published over 100 scientific articles in leading peer-reviewed journals. And I've also written many societal comment essays that have been very popular. And I wrote a book also about freedom of expression in the fight against racism, which I have recently made freely available on the internet. So that kind of gives a very nutshell picture of my activities, let's put it that way.

Dr. Joseph Mercola:

Okay, great. So are you still in Ottawa?

Denis Rancourt:

Yes, I am. I'm doing the interview from Ottawa right now.

Dr. Joseph Mercola:

Great. My ex-wife lives there, she's a physician up in Ottawa and [a] native, and was actually born there too. So anyway, I'm wondering what motivated you to pursue this mask topic in such great depth as you have?

Denis Rancourt:

Yes. Well, it was part of my research at the OCLA. We immediately recognized when this started to be talked in the media of this new viral epidemic, which was then declared a pandemic. We immediately recognized it as being something that we should pay attention to. And I immediately started researching the epidemiology and the virology of this thing and reading the papers as they came out and then seeing how there was a big emphasis on masks. I became interested in that. So I did a very thorough study of the scientific literature on masks. And I concentrated on, "Is there any evidence that masks can be of help in terms of reducing the risk of getting one of these viral respiratory diseases?" And what I found is when I looked at all the

randomized controlled trials with verified outcome, meaning you actually measure whether or not the person was infected, I found that there were none of these well-designed studies that are intended to remove any bias, any observational bias.

Denis Rancourt:

Out of all of the many trials that were done, none found that there was a statistically significant advantage for this application to wearing a mask versus not wearing a mask. And likewise, there was no detectable difference between respirators and surgical masks. So that to me was a clear sign that the science was telling us that they could not detect a positive utility of masks in this application. And so we're talking many really quality trials. And so what this means, this is very important, because what it means is that if there was any significant advantage to wearing a mask to reduce this risk, then you would have detected that in at least one of these trials, and there's no sign of it.

Denis Rancourt:

So that, to me, is a firm scientific conclusion, there is no evidence that masks are of any utility either preventing the aerosol particles from coming out or from going in. You're not helping the people around you by wearing a mask, and you're not helping yourself preventing the disease by wearing a mask. This science is unambiguous in that such an effect, positive effect cannot be detected. So that was the first thing that I publicized. I wrote a large review of the scientific literature about that. But then I asked myself as a physicist and as a scientist, "Why would that be? Why would masks not work at all?" And so I looked into the biology and physics of how these diseases are transmitted. And what I found-

Dr. Joseph Mercola:

I think it's fair to say we are in a brave new normal, we're rationally paranoid and authoritarian. And largely because of the enormous amount of fear of being engendered by the conventional mainstream media, the vast majority of the population believes in masks and has now actually – initially they weren't, but because of all this messaging has been going out over the last few months you are essentially vilified if you are seen in public, most public places now without a mask. And you will not be able to fly without a mask, and you won't be able to take an Uber or a Lyft without a mask. So the consensus of the public is firmly in favor of masks. So I want to present their position and have you respond to that because part of it, as I said, I posted this video a few months ago. And what the video focused on was a group in the Czech Republic who was one of the first adopters of wearing masks in Europe. And they had really rigid controls on people coming into the country.

Dr. Joseph Mercola:

And they appeared to have had really quite good success. They've only had a few hundred deaths. When you contrast this to Sweden, who is a country with about the same population of the Czech Republic, had more than 10 times that amount of deaths. And I think that deaths is the best barometer of what we're seeking to assess. Because number of cases in my mind is 100% irrelevant, that's another discussion we can dive into later. But the deaths are really sort of a hard endpoint if in fact the deaths are being categorized correctly, because you can have people like George Floyd who was killed, murdered by a police officer, but he had COVID-19. So I believe

his death is counted as a COVID-19 death not as a homicide, which is insane. And that's just one example of it. So these death numbers are up. But anyway, so how do you counter the experience of the Czech Republic where there appears to be some effectiveness of this strategy?

Denis Rancourt:

Okay. Well, there's a lot to unpack in your many questions there, but I can-

Dr. Joseph Mercola:

Well, I'll let you have it. It's all yours now.

Denis Rancourt:

Well, first of all, I agree that deaths, you cannot easily fake a death, and a death is counted as a death. So a death is a death. And so you have to look at deaths. But you have to look at all-cause mortality deaths, you have to look at all-cause mortality data on a per week or per day basis because that's reliable. If you try to assign a cause of death in a complicated situation like this with a viral respiratory infection that taxes your immune system and you die if you have comorbidity conditions. To try to unravel that is known, epidemiologists have known this forever since the discipline started that you can't reliably do that. And there are tremendous sources of bias. There always have been in terms of assigning deaths in the middle of an epidemic.

Denis Rancourt:

So you don't do that, you look at all-cause mortality. And I've done that, I did a detailed study of the actual current data of all-cause mortality. And what you find is that, and this is very important – the winter burden deaths, all causes is not any different statistically from the previous several decades. So this was not a killer pathogen, this was not anything out of the ordinary in terms of the usual array of viruses that give us viral respiratory diseases.

Dr. Joseph Mercola:

I believe you created a graph that illustrates this.

Denis Rancourt:

Yes, it turns out that these curves, which show the winter burden deaths as humps every winter, some of them in some jurisdictions have an additional very sharp peak. It doesn't represent an ominous, it doesn't represent a huge amount of deaths by comparison to the total winter burden because it's a very sharp peak, but it's an anomalous peak. It's not a natural peak. And it happened in exact coincidence and time everywhere. Every jurisdiction that sees this peak as sharp, anomalous, unnatural peak that's not due to the virus itself acting in a natural way in the society. Every jurisdiction that has this peak, the peak started exactly when the pandemic was declared by the World Health Organization (WHO). And the WHO at that time recommended that states prepare their hospitals for a huge influx of people with critical conditions.

Denis Rancourt:

And so the government response is to that WHO recommendation is what killed people, what accelerated the deaths. And you can see that in the data, and you can also understand it in terms

of how immune-vulnerable people are affected by these kinds of diseases. So what you did is you closed people into their institutional places of residence, you didn't allow visitors in. So you isolated the most vulnerable parts of society that already had comorbidity conditions that were in a fragile state. You isolated them, so you had a huge psychological stress burden on them, and you closed the environment. So you locked in all the aerosol particles which fill the air and are in suspension in the air. And that is the main transmission mechanism I've concluded from looking at the scientific literature that causes this disease.

Denis Rancourt:

So you ensured that many people that were locked into these institutions would die from this particular seasonal virus that causes the respiratory disease. But the virus itself is not more virulent than other viruses. The total winter burden deaths is not greater, but there is a signature of a sharp feature that lasts the full width at half maximum. This feature is three or four or five weeks, which is extraordinarily rapid, never been seen before. And it happens very late in the winter burden season. And so a sharp peak like this has never been seen this late in the season before, and it's happening in coincidence everywhere on every continent where it occurs at the same time in direct immediacy after the declaration of the pandemic.

Denis Rancourt:

To my eye, there is no doubt that there was an acceleration of deaths of vulnerable people due to government responses. And that that should be investigated even criminally, that there should be broad investigations in the jurisdictions where this happened to try to understand precisely and to document and to find responsibility for the decisions that were made, which were not science-based about these accelerated deaths. So that's one of the results of my studies. You also mentioned that the fact that masks were being pushed by the establishment in an incredible way. There's a huge push to promote masks. And I think I've developed an understanding of that.

Denis Rancourt:

The establishment in Ontario where I live, in the province where I live, virtually all the municipalities are passing bylaws to enforce that masks be worn in public places everywhere. It's crazy. And it's like a tsunami of these new bylaws and decisions. So you ask yourself why in a situation where the science says there's no advantage to wearing a mask. In fact, the science, the scientific examination of this is that masks applied to the general population are dangerous. There are many listed dangerous, even dangerous that the WHO admits to. And other dangers that we have pointed out because my organization, the Ontario Civil Liberties Association wrote to the WHO saying, you've got to retract this recommendation of masks that you've just put out. Anyway, all this to say that-

Dr. Joseph Mercola:

Before we go down the dangers because I definitely-

Denis Rancourt:

No, we won't go down to dangers. I was just going to say, "Why does the establishment want us to wear masks?" I've come to the conclusion, the following conclusion. The establishment desperately wants to convince us to wear masks because personally wearing a mask,

psychologically cements in the person this idea that we live in a world where there are dangerous viral pathogens that cause respiratory diseases that are extraordinary. And that the only way you can be protected is that the state is going to control your life and is going to give you vaccines. So this is the thing. It's fear-based. It's a frenzy, it's like a call to war, and it's irrational. And it's intended to foment a kind of nationalism like you would in going to a war that is unreasonable and that is done for other reasons than the ones that are claimed by the government. So it's like a call to war where you're fomenting this nationalism, but the nationalism in this case is a belief that you live in this extraordinarily dangerous environment all of a sudden, which is untrue.

Dr. Joseph Mercola:

I think that's a very astute observation. And I'm wondering if you believe that this is something that the promoters of this understood and was intentional about or it's just an artifact of the recommendations?

Denis Rancourt:

Well, I don't get to sit in the board rooms. I don't get to be in the Zoom discussions where the elite financiers say how they're going to direct their think tanks to say what and to do what. But it's clear that top influencers that also control our economy have a lot of leverage. And it's clear that they think about how to keep control and have greater control over – they're very concerned about middle class and professional class people in the Western nations because their power depends on these people being compliant and agreeing with their schemes. So there's a lot of propaganda, there's a lot of institutional design and control to keep people in line and to keep them managing the global system that these global financiers live off of.

Denis Rancourt:

So there's no doubt in my mind that they decide – I mean, I saw a really stunning example of the coordination of these powerful people when I did some research on climate studies. I saw that there was a time in the beginning 2000s where the establishment decided they were going to push this idea of climate change and global warming being the significant danger. So before this particular date, there was debate in the mainstream media. There were scientists speaking on both sides. And then all of a sudden, overnight, every major newspaper in every Western-controlled nation started covering climate change as a danger in a one-sided covering (*sic*) five times more in terms of numbers of articles and pages and words written than they did previously, overnight. You can draw graphs and you've got this incredible spike.

Denis Rancourt:

Now, that doesn't happen from the accident of publishers wanting to sell newspapers and trying to figure out how to do that. This is coordinated, this is the actual publishers instructing their editors of what the line is now. And I believe that there is quite a network of coordination globally. It's very obvious when you see prime ministers of different countries all saying exactly the same talking points as though they were reading from a script on certain issues. There are many YouTube videos about this that are quite stunning where the prime minister of Australia, Canada, the U.K., they're all reading exactly the same script at the same time across the world. This doesn't happen, these are not accidents. And they're not because they're particularly well informed in the usual way of informing information-gathering. It's because it's coordinated in my

view, it's not happening by any other mechanisms. So I've seen in my studies on globalization and as part of being a researcher at the OCLA, I've seen this over and over again. So this is exactly that kind of thing, it's a coordinated campaign.

Dr. Joseph Mercola:

Well, we can talk for hours about that, and we very well may. But I want to take it back to the mask because I don't believe I got a clear answer to the Czech Republic differential-

Denis Rancourt:

Oh no, I didn't answer that.

Dr. Joseph Mercola:

And Sweden's experience. Obviously Sweden was a little more liberal in their adoption of some of the social distancing rules and everything. So that may be a more dramatic comparison. But nevertheless, it is one that still changes by tenfold. And I don't think the acute peaks that you were referencing explains that.

Denis Rancourt:

Yeah, no. I didn't look at the Czech Republic specifically, I didn't look at that in detail. But overall, my answer would be that all of these studies that attempt to find a correlation between even deaths, never mind cases as reported, but deaths in terms of the habits of people, whether or not they're wearing masks, whether or not there was an order to not go outside, a lockdown and so on. All of these studies are very tenuous. It's extremely difficult to do valid studies and to come to valid conclusions regarding the impacts of these social distancing and masking policies. So I don't have any faith in them. But I come back to this idea that what really matters is the hard data, and the hard data is all-cause mortality in any jurisdiction that you want to look at. And it has not been anomalous statistically speaking no matter how you slice it.

Denis Rancourt:

Now, having said that, however, I need to qualify. And this may answer your question a little more. You see, the transmission mechanism of these diseases, the dominant route is very fine aerosol particles that are in suspension in the air. Those aerosol particles stay in suspension when the absolute humidity is low, that's why these are winter events. As soon as absolute humidity rises, the aerosol particles are not stable in there. They condense water, they agglomerate and they drop out through gravitational and the thing does not transmit anymore. This is well-known, it's been known for a decade. It's been extraordinarily well demonstrated by top scientists. There is a band in latitude where this dry weather at the right temperature is ideal for transmitting this category of diseases, these viral respiratory diseases. And that banded latitude is in mid-latitudes.

Denis Rancourt:

So it's in the winter in the Northern Hemisphere and it's inverted because the winter in the Southern Hemisphere is our summer. So you see it in both hemispheres but inverted by year like that. So the high transmission occurs in that band, it's very well-studied. There are recent papers this year that have come out and said it again and so on. And that is why when you move down towards the equator, transmission drops, you don't get transmission. This is not an issue when

you get to lower latitudes. And likewise, if you go too far north, it also does not transmit, and that is not well understood. I have some ideas as a physicist, I'm an expert in environmental nanoparticles and how they charge and what they do. So I have some ideas about why that is, but it hasn't been studied in detail.

Denis Rancourt:

But the point is the transmission band is very narrow, it's across Europe and North America in jurisdictions where you have temperatures between about 0 degrees and 10 degrees Celsius, and you have low absolute humidity. That's where these aerosol particles that are the vector of transmission are completely suspended as part of the fluid air. They're really part of the fluid air, so any air that gets through, they're going to come through. That's why masks don't work. And these particles are in suspension in the air and get trapped indoors. So that's why centers where you have sick people and you're not controlling the air environment are centers of transmission. So we're talking about old folks' homes, hospitals, even people's homes traditionally are where you will catch it when you visit someone. This entire class of diseases, this is how they're transmitted.

Dr. Joseph Mercola:

I'm going to just ask the question about the particles. So I'm just curious as to what you're referring to so we have the same definitions. Is this a generic particle, could be a dust particle or is it actually the particle of the virus, which is much smaller than dust particles?

Denis Rancourt:

Yeah, neither. Let me explain that. So we're talking about the small size fraction of aerosols, so typically smaller than 2 micrometers. And there are water droplets that bear these virions, that bear the virus particles. And there can be dozens or hundreds of these virions per very small droplet of this size. So those are the droplets we're talking about. When you get down to those sizes, gravitational outtake is very inefficient and they basically stay in suspension. And as soon as you have currents or flow of air and so on in that fluid, which is the air, they're just there, they're carried. So there have been many studies that have measured the densities of such particles of the smallest size fraction and finds high densities in many places.

Denis Rancourt:

There was an article that demonstrated, for example, people were stuck on the tarmac in an airplane, the ventilation was off, they weren't taking the air out. And there was one or two people that had a nasty cold as is common in the winter. And virtually everyone on the airplane got infected within a week, they were able to determine that everyone got infected and it was interpreted as being due to being exposed to that aerosol environment in the airplane. So there are many studies of this type and other studies in restaurants as well, and so on. And so we're talking about small aerosol particles, which are water-based, which are saliva- and water-based and that are stabilized as spheres because of surface tension that are very small. And the only way to take them out is if theyglomerate, become bigger and then gravitationally come out. Now, in dry air, they don't agglomerate and they stay a very long time in suspension in the air. That's why absolute humidity is a major controlling factor within that temperature range that I described.

Dr. Joseph Mercola:

Okay, good. Thank you for expanding on that. So I'd like to focus the discussion now and keeping it real simple because I don't want to go too scientific, it makes it difficult for people to follow. But the reason this is so important is that, as we mentioned, is agreed upon is that there's this massive consistent messaging that they're getting propaganda from the media. So most people firmly believe in wearing mask. So I think if we give them some basic understanding on the mask, and I want to go in that direction now as to why they may or may not work. Now, they appear to work in some circumstances, in certain scenarios like if you are in the operating room. And I've been in many surgeries before and you have to scrub up and it's a sterile environment for the most part so that you don't have a lot of these other things going on and everyone in the operating room is wearing a surgical mask.

Dr. Joseph Mercola:

It appears to work in that environment. If it didn't, I don't think they would persist. So why don't we address that first and then we'll talk about the differences between an N95 mask, a surgical mask, and a cloth mask that's made out of whatever material.

Denis Rancourt:

Sure. Well, there are certainly applications of masks as you said in the surgical room, and I've been reading a lot about this that clearly are demonstrated to be important. And that's because if you have an open wound and you're operating on someone, you don't want to be spitting in their wound, you don't want to be putting all the microbes that are in your saliva into that wound. And that is very important. So the surgical masks in that application, as I understand, are intended to prevent the surgeon or the attendants from infecting the open wound. And it has been demonstrated to be important in that application. The application that we're considering though is the transmission of a viral respiratory disease, which is a completely different beast because the vector of transmission is not a saliva or spitballs or large droplets even, it is these extraordinarily small aerosol particles that are in suspension and are part of the fluid air. So that's what you're trying to prevent with the mask.

Dr. Joseph Mercola:

Correct. Because that's what many people are – they know, it's within a culture that if you're going to be getting in surgery, you're wearing this mask. So they're assuming that it extends to these other applications, and it likely does not.

Denis Rancourt:

Yeah, that's right. And the best randomized controlled trials with verified outcome. In other words, the only scientifically designed studies that remove observational bias and that are valid and that are rigorous, most of them are in clinical environments. And so they're looking at healthcare workers treating people that potentially have a viral respiratory infection or treating people who they know have such an infection and they're doing something that will potentially generate a lot of aerosol particles by the treatment. And so many, many trials have been done in that environment and none of them find any advantage to the health care workers as to whether or not their likelihood of being infected wearing masks versus not wearing masks and also surgical masks versus respirators, no difference. There is no difference that can be detected. And

there have been several, many, many randomized control trials and meta-analyses of these randomized control trials. And nobody can detect any advantage or difference between those two types of masks in those clinical environments. And there have also been-

Dr. Joseph Mercola:

Let's stop there because I'm not necessarily a huge fan of meta-analysis. They can be used so frequently to sturb at the truth and misguide people because of selection bias, they pick the wrong studies to put in there. So I think looking at each individual studies is a lot more, especially randomized controlled trials are more appropriate. I wanted to go back to this, the reason why the mask may not work because the other rational justification. And this is commonly used is that when you're wearing a mask, it's not so much protecting you from getting the infection, although that might be different with a N95 mask, but it's protecting others from being infected. So in these studies you're referencing, are they looking at – they're probably not looking at that phase of the observation, they're looking at the actual mask wearer becoming infected rather than the person wearing the mask infecting those they're connecting with or-

Denis Rancourt:

Let's be specific. In those studies that I'm talking about, and I did review the individual randomized trial studies, and I agree with you that meta-analysis can be very misleading. In the studies, they're looking at whether or not the health care workers themselves are being infected. Now, the health care workers are working together, so they're in proximity to the patients but also to themselves. And the studies do not discern how they would have been infected, from their colleagues or from the patients or some other way. They only measure the total outcome. The study is not designed to discern that, so you can't tell. But they find that in any case, it makes no difference-

Dr. Joseph Mercola:

What is the outcome? The mask wearer or anyone-

Denis Rancourt:

The measured outcome is whether or not you were infected. And you are looking if any health care workers in this study are infected, whether they're wearing masks or respirators or nothing at all. So they don't discern whether you're protecting others by wearing the mask versus you're protecting yourself. It's not discerned. But I would argue that since it's not discerned and there are many studies that these studies speak to the fact that it does neither because they're in proximity to each other and it makes no difference. So it makes no difference if everybody in your team is wearing a mask, it makes no difference if one is and others aren't.

Denis Rancourt:

They don't discern that, but they don't detect any difference. So that's one thing. To be fair, the question has not been explored in a rigorous randomized control trial, specifically that question. But then you can ask, why do masks not work? That's conclusive than masks don't work in this application. If you-

Dr. Joseph Mercola:

Work in what respect, protecting the user from getting infected or the people-

Denis Rancourt:

No one who wears a mask or is in an environment where masks are being worn or not worn, there's no difference in terms of your risk of being infected by the viral respiratory disease. There's no reduction, period. There are no exceptions. All the studies that have been tabulated, looked at and published, I was not able to find any exceptions, if you constrain yourself to verified outcomes.

Dr. Joseph Mercola:

And most of these studies, were they using surgical mask? I would assume would be the-

Denis Rancourt:

As I said, they do both. There've been I believe five or six studies where they did detailed comparisons between respirators and surgical masks. And yes, most of the studies are-

Dr. Joseph Mercola:

What's the difference between a respirator and a surgical mask? Is that the N95 mask, the respirator?

Denis Rancourt:

Yes, that's what I mean.

Dr. Joseph Mercola:

So why don't we look at why on a physical, simple, basic common sense understanding of why a surgical mask may not work in this context because of all the gaps and you take it, you to put it on, you take it off. And then we can address the N95 mask and the cloth mask later, but the surgical mask is pretty much I think the standard for most people if they're going to use it. I mean, there's people in other [inaudible 00:37:59] too, but let's hit that one first.

Denis Rancourt:

Well, first I think it's important to say and to recognize that when we try to explain why and elucidate why using physics and chemistry and biology and how you get infected and what is the minimal infectious dose and all these things. As soon as you start to get into the mechanism, you're just making up a story in a sense, you're trying to use scientific concepts-

Dr. Joseph Mercola:

Well, sometimes stories help, stories help sometimes.

Denis Rancourt:

Yes. But I just want to emphasize that whatever mechanism we describe and come to believe might be the most plausible one, it's not one that has been demonstrated to be true by randomized controlled trials or anything like that. So you have to separate that the randomized controlled trials tell us, first of all, that masks don't work in this application. And if they did work, you

would have seen it. And you're trying to detect it, and you don't detect it. That's one thing. And that is separate from trying to have a story of, well, "Why is it?" Because people confuse these two categories of explanations. And I think it's important to recognize that no matter how clever your explanation is, it may not be right. So that's the first thing. I have nonetheless, I've gone ahead and tried to develop the best possible explanation as to why masks don't work.

Denis Rancourt:

And as I said, I've come to the conclusion that the most prominent vector of transmission is these fine aerosol particles. Those fine aerosol particles will follow the fluid air. So in a surgical mask, there is no way you're blocking the fluid air. When you breathe wearing a surgical mask, the lowest impedance of airflow is through the sides and tops and bottoms of the mask. In other words, very little of the airflow is going to be through the actual mask. The mask is only designed and intended to stop your spitballs from coming out and hitting someone, it's not about ensuring that the flow of air is through the mask. And it's not through the mask, it's through the sides. And if the flow of air is through the sides, whatever is carried in the air, whatever molecules or small particles are carried in the air are going to flow that way as well, and that's how you get infected.

Denis Rancourt:

Now, that means that if we're correct in this picture, which I believe is correct. For now, it's my most plausible working model. If that is true, those aerosol particles are going to go out as easily as they're going to come in. In other words, any aerosol light particles coming out will go out in the same way. There's perfect symmetry here in terms of the physics. If you're not stopping them coming in, you're not stopping them coming out either. They follow the flow, period. That's the way it is. So that's why there's an equivalence I think between, "It doesn't protect you and it doesn't protect anyone else either."

Dr. Joseph Mercola:

Now, one of the arguments that the mask proponents' state is that although what you said is true, they believe that it reduces the total viral load that the obstruction to breathing out is going to catch some of these spitballs. And as a result, you won't have as large a viral load being emitted by a potentially infected individual. That is their justification why wearing the mask doesn't protect you, it's protecting them.

Denis Rancourt:

Yes, I know that. But it's not relevant. The large droplets drop to the floor immediately and they're not breathed in. So they're not part of the transmission mechanism. Let's put it this way, everything-

Dr. Joseph Mercola:

This is what they're saying though, this is what they [crosstalk 00:41:51]. This is why it has to be addressed.

Denis Rancourt:

I know everything is possible, very few things are likely. So you can do a study, a scientific study that demonstrates that viruses survive a fairly long time on a surface, whatever that surface is and you can study different surfaces. That does not mean – these are called fomites, these surfaces where viruses can live or stay alive and stay active. That does not mean that transmission occurs through surfaces. It only means that a scientist was able to establish that a virus can survive a long time on a surface. It doesn't tell you anything about the likely transmission mechanism of the disease. And so there are a lot of studies like this that are just basically irrelevant in terms of transmission mechanism.

Denis Rancourt:

For example, there is a whole bunch of studies that physically demonstrate that a mask or a cloth or anything will stop some droplets when you try to push droplets through it. It's irrelevant because that's not the transmission mechanism. That's the point, is that you have to try to see how does this extraordinarily contagious disease, because all of these viral respiratory diseases are extraordinarily contagious. And the reason they are is because they're transmitted by these fine aerosol particles that are in suspension in the air. And in a case like that, will a mask, will something that is preventing spitballs from coming out protect you or protect others?

Denis Rancourt:

And the answer is no, it makes no measurable difference. There are many studies that show how difficult it is to actually infect someone when you're just trying to put something like a fluid or something that you know is bearing the virus into their eye or into their nose. It's hard to do. That's what the studies show. But if you take a fine aerosol and you breathe it in deeply, that's where the infection starts and that's where the virus has evolved to be most effective. And that works fine. So breathing in aerosols that are laden with these viruses, you're going to be infected. Try to do anything else, it's going to be difficult. The most recent randomized controlled trial this year basically concluded that even hand-washing in terms of reducing the risk of these types of diseases, hand-washing and distancing, they couldn't find any evidence that it was of any use. Masks, distancing and hand-washing didn't help.

Denis Rancourt:

There's this dissonance between what the science actually tells you when you measure correctly and what the health authorities would like to tell you to do. They want you to be convinced that you're in this dangerous environment and that if you follow their directives, and they're going to keep giving you what the directives are, that's their purpose in life, is to control your life and to give you directives, and you're going to accept that. And that's part of how they convince you that you absolutely need the state to save your life. I think that's what's going on. But the science doesn't agree that you have to be 2 meters apart, it doesn't agree that you have to wash your hands continuously, it doesn't agree. There isn't even a demonstration that this idea that masks are dangerous because you can touch them. They do concentrate the pathogens, you touch them, and then you might touch your eye or your mouth and so on. There's actually no scientific demonstration of that happening or that being likely to happen. It's just one of these stories, one of these that I was talking about, one of these explanation.

Dr. Joseph Mercola:

Well, let's look at the differences between the N95 respirator mask and the surgical mask because from my understanding, they appear they could protect the user, the person wearing the mask from contracting the infection because they do indeed force you to breathe in air through the mask and there are no holes around there if it's worn properly. But here's the kicker, these masks were not designed for protecting a person in infectious environments, it's designed for hazardous chemical use. And I actually had a whole box of these in my garage just for that specific reason well before the pandemic started because I needed to have something to filter when I was exposed to environments where I was going to be breathing in something potentially bad. So these masks, as I understand, are designed to be vented out when you're breathing. So there's no filtration going when you're breathing out. The only filtering is when you're breathing in.

Denis Rancourt:

Well, you can have both types. A lot of the ones that they're selling have out vents, that's true, and so guarantee. And it's crazy because you have some advertisements for these masks, they have pictures of them. They have big out vents on tied to an article on the internet that explains that you need to protect people by wearing these things. It's crazy.

Dr. Joseph Mercola:

There's no protection, none.

Denis Rancourt:

They don't all have out vents, and there are many that do not have out vents. And the problem with the ones that don't have out vents is that when you breathe out, they get pushed away from your face. And that phenomenon of pushing, the force pushing it away is a strong force. I mean, you have to breathe out. And as you use the mask, it also gathers humidity and the humidity makes it harder to breathe through so it gets pushed out even more. So I think these N95 masks for sure when you exhale, you will exhale whatever aerosol particles are in your breath because of this phenomenon. Now, even if you tried to seal it and put really tight straps on it, there is always non uniformity in the pore size of the mask. They're not manufactured perfectly, there are seals.

Dr. Joseph Mercola:

Yeah, they're not N100 masks. They exist, but most of them are N95.

Denis Rancourt:

But they're not manufactured perfectly also. And there's always imperfections on your skin. You have hairs, wrinkles, all kinds of things. Those biggest holes, if you like, are where the low impedance flow is going to occur. And these aerosol particles will get through just like the air does. So even in that case, again, this has not been studied specifically with a non-biased trial. This is us trying to understand these things. And then when you breathe in, same thing, there's going to be imperfections. You're going to move it also. And it's interesting because one of the randomized control trials, a big one that compared masks and respirators, N95s with healthcare workers, the only statistically significant outcome that they discovered and reported on was that the healthcare workers who wore the respirators were much more likely to get headaches and

they suffered from headaches. So there you go. Now, if you've got a bunch of healthcare workers, which you're forcing to get headaches, how good is the healthcare going to be?

Dr. Joseph Mercola:

Yeah. Well, this is the other point I wanted to discuss because you've done a very good job of elaborating the likelihood of the non-effectiveness and their intended purpose to prevent transmission. But very few, virtually no one is talking about the downsides of wearing masks. So you mentioned one, headaches. Why don't we just go down that rabbit hole? Because I believe there are others that result from breathing in air on a long-time or long-term basis where you have lower partial pressures of oxygen.

Denis Rancourt:

Yeah. There are a lot of admitted dangers to wearing masks, the WHO in its memo, its recent memoir, I believe, is June 5th where they reversed their position and decided that it was a good idea to recommend mask use in the general population. In that document, they actually say you have to consider the potential harms and they list what they consider are all the potential harms. They missed a lot. But one of the first, the top ones, is you're concentrating the pathogen-laden material onto this material near your face, nose, eyes and so on. And you're touching the mask all the time, you're touching yourself, you're touching others. It's not a controlled clinical environment, so there's potential for transmission in that way. You might wear the mask more than once, you might store it at home and then wear it again. You might do all kinds of things.

Denis Rancourt:

So you do not have a controlled environment in terms of how to dispose of that pathogen-concentrated material. So that is a danger that's admitted and they warn you off. And that was the main danger that the health organizations, that was the reason that they did not recommend masks in the general population. Now, there've been no studies that eliminate that danger that show that it's not viable, nothing has changed in that term. But they just decided for political reasons to now recommend masks as I understand it. So that's one admitted danger. They also mentioned-

Dr. Joseph Mercola:

Dr. Fauci's justification at least in the United States was that the position was, [inaudible 00:51:52] which you initially described. But then when he retracted that, he said, "Oh, we were lying because we wanted to preserve all the masks to protect the health care workers." And that's why they changed their position. That's the story that they gave. Now, whether or not that's the truth, who knows?

Denis Rancourt:

Yes, I saw that. I saw the video where he admits he was not telling the truth there when he was explaining that. So that's an admitted danger. The WHO document has a long list of admitted dangerous. And what I find extraordinary is that they also have a list of what they call "potential advantages." And when I compare the two lists, the potential dangers far outweigh the potential advantages. And so you have to ask yourself, "What the heck are you doing?" How can you make these two columns and compare the advantages and disadvantages and have one clearly

outweigh the other and then conclude that, "Therefore we recommend masks?" This is just nonsense, right?

Dr. Joseph Mercola:

Irrational.

Denis Rancourt:

It's irrational, yeah. So then we added our list, my association added our list of things that they weren't even considering. We went into the civil liberties aspect of it as well because I think this is very important. One of the fundamental aspects of a free and democratic society is that the individual is entitled to evaluate the personal risk to themselves when they act in the world. Risk evaluation is a very personal thing, it involves your personality, your judgment, your knowledge, your experience and your culture. And it's a very personal thing that you do, you're entitled to do for yourself. When you decide to go outside, walk on the sidewalk, take a bicycle, go someplace, meet people, accept a medical treatment or not. Anything you might do, you are the person who evaluates the risk to your person, to your body. That is a fundamental thing that you are entitled to do. That's part of your independence as an individual in a society.

Denis Rancourt:

And if the state is forcing you to accept their evaluation of risk, then you are violating that precept. And in addition, it's doing it in a case where there is no scientific justification. I can understand if the state is saying you cannot shoot live ammunition in a public square. It's clear, there's all kinds of evidence that that is a highly dangerous thing that puts others at risk. But wearing a mask is nothing like that, it's a world apart. We have tried to find evidence of the effect of masks in this application, and we can't find any. That means it sets a lower limit on the effectiveness of masks that is so low. In other words, the risk involved here, the risk reduction that may be possible, that is unmeasurable is very small compared to many others risks in society that the government, that the state admits and even condones, and even is responsible for sometimes.

Denis Rancourt:

So that is a civil liberties issue in itself. The other important thing is we also pointed out that when you convince people that masks are the solution, and you get everyone to wear a mask, the government and the institutions are removing their duty of care towards you, because they're saying all you need to do is get people to wear masks. We don't have to actually prevent transmission in the centers of transmission. We don't have to manage the air in such a way that not everybody who is immune-vulnerable in this establishment will be at risk of dying and so on. They remove their duty of care responsibilities by saying, "Well, we're just not going to allow visitors, and we're going to force everyone to wear masks."

Denis Rancourt:

Well, no, you need to look at scientifically what is happening here, why are people at risk? What is immune vulnerability due to? What can you do about it? And then you have to do something about it if you're serious about your duty of care towards these people. So I think it's partly also,

it has that side effect of letting them get away with not taking care of the people that they're responsible for.

Dr. Joseph Mercola:

Yeah. It's also setting the precedent that if they can get away with instilling or forcing everyone to wear a mask for the greater good not for scientific justification, but for the greater good, then it's a very small step to force everyone to get a mandatory vaccine for the greater good.

Denis Rancourt:

And I agree. We went further in our letter, we put it this way. You see, there's a recent scientific study that is seminal in my mind that came out last year 2019. Actually the first author is the executive director of the OCLA who I do the research for, and he's a physicist also. And he wrote an article with another physicist. And what they showed was they tried to look at under what conditions a society will gradually degrade towards a more totalitarian state. And what they found was that there were two major control parameters that characterize the society that will tell you if that is likely to happen or not. And one of those control parameters is authoritarianism in the society. And what they mean by that is how successful can an individual be to refuse something, like to refuse to wear a mask if they protest, what is the chance that they'll succeed if they refuse?

Denis Rancourt:

So that would be related to the degree of authoritarianism. And then the other important parameter is the degree of violence in the society. So how violent is the repression if you disobey? So how big is the fine? Can you go to jail? How much punishment will you be subjected to and personally suffer if you disobey a particular rule, for example, wearing of a mask? So those two parameters, they were able to establish, what we call a "phase diagram" of societies in the diagram of those two parameters. And what they found is that in present society if you would estimate that the average value of those two parameters for the United States or Canada, we're in a state right now where the society is very gradually and very slowly evolving towards totalitarianism.

Denis Rancourt:

And the way to slow that and to prevent it is for people to object and to scale it back. So as soon as you agree with an rational order, an irrational command, and you agree to go along with it, and it's not science-based, then you are doing nothing to scale that back. You're doing nothing to bring back society towards the free and democratic society that we should have. And you are allowing this slow March towards totalitarianism. That's how I would explain the importance of objecting to this and of trying to find it in society that people will resist this.

Dr. Joseph Mercola:

Well, great points. And that's an area I wanted to dialogue with you on because it would seem to me, and I've been somewhat negligent about diving deep into this to study, to come to really scientific or at least evidence-based conclusion based on the research what seemed to make the most sense like you have. I just didn't have time because I've been focusing on the other side, the preventive aspect, building up the immune system and looking at all the variables around that. So

that's been my primary focus. But that's one of the reasons I was interested in engaging in this discussion to bring up my level of knowledge on this. But assuming you've done this due diligence and you've reviewed the evidence and you're convinced that masks don't work and it's actually even worse than that, they make you sick, or at least they radically increase your likelihood of getting ill from some other disease.

Dr. Joseph Mercola:

So you conclude wearing this mask is providing essentially no benefit to me or those that I'm exposed to or who are exposed to me. So you have that conclusion, you understand that participating in this nonsense is actually going to increase the risk of even further craziness from the government. So what have you concluded and do recommend as a way to not violently protest? Because there are some complications of resisting this. I mean, if you don't wear your mask on a plane, you will be permanently barred from ever flying the rest of your life on that airline. That's it, you're gone. You're just history. That's sort of an extreme example, but maybe you could walk through. And I'm sure you thought this through as to how people can object to this nonsense and essentially wearing the mark of the beast.

Denis Rancourt:

Wes, well by coincidence, the OCLA today, this morning, just put out a press release and put out a statement that it formally recommends peaceful, civil disobedience regarding mask-wearing in Ontario. And in the memo that was put out, we explain how best to perform that civil disobedience. So we explained to people that you should be calm and confident and not get into arguments and not try to convince the authorities, just express your dissonance, sorry, your disobedience regarding this rule. And then we explain that they may want to trespass you, they may want to give you a fine, that you can anticipate fighting that fine in court. We go through the steps so that people can visualize how to do this.

Denis Rancourt:

And we explain that some of their co-shoppers or co-citizens will be angry and will be aggressive, and to not get into a fight and not to get into a word of words or not try to convince them, but to just stick to that they are not going to comply and to be very calm and to have the kind of civil disobedience that we've seen be successful at various times in North American history and to try to practice that. And that there are risks involved but it's often worth it to the individual to have that civil disobedience because there are many individuals who don't know what to do that are very angry because they're being forced to wear masks and they see it as absurd and a constraint.

Denis Rancourt:

And so we try to give them a view of a venue on how to resist this. And so that memo just went out today this morning, in fact. And I support that view. Later today, I'm going to be going to the Parliament, I'm in Canada's capital, Ottawa. And I will be taking the public transit where they recommend masks, and I will not be wearing a mask. So I'll see how that goes. And I will be going to the demonstration on Parliament Hill against these kinds of impositions. So we'll see. And we also recommend when people are practicing this kind of civil disobedience that they not be isolated, that they try to form a grassroots group of support and that they don't do it alone, that

they try to bring at least one person, one supporter with them, that they record the interaction with the authorities, that they report back on social media and to their groups with details of what happened and so on.

Denis Rancourt:

So we make all these kinds of recommendations, and we hope that will help to reduce the tension between those who want to not wear masks and those who think that it's vital and that our lives are in danger. We hope to create kind of a smoother messaging that a lot of people or at least some people do not believe this mask story and do not believe that they are at risk and are willing to practice civil disobedience to make that point.

Dr. Joseph Mercola:

Well, that's great. I'm inspired. Sometimes it's just not I guess obvious, that's a practical alternative that you just don't even factor into the equation. So I'm actually going to be speaking by the time this interview is out probably the same week or right around in Las Vegas, I'm one of the keynote speakers at FreedomFest, there'll be well over a thousand people, there's going to be 2,000 people there. And the governor of Nevada has required mask wearing throughout all public places in Nevada, which includes Caesar's Palace, where the event is at. And I'm giving a lecture on masks. So I'm going to encourage everyone to peacefully be civilly disobedient.

Denis Rancourt:

I think we wrote a very good memo, maybe it'll be an inspiration to you.

Dr. Joseph Mercola:

Yeah, yeah, definitely. We could at least put a link to it in this article. But that is a good strategy because it may be a painful and uncomfortable and take some of the time out of your life. But it's really I think an important step in preventing the relentless march towards, towards totalitarianism, which is on the road that we're on. And we just got to stop this sometime. You can't give in, you've got to object, say this is not right. You don't have a logical, scientific justification to implement this.

Denis Rancourt:

Yes. Well, unfortunately in the past this march to totalitarianism has led to dreadful wars and it took these huge catastrophes to have a reset and then to have the start again of society and democratic institutions and so on. Unfortunately in the past, it has taken that kind of an event to get a reset. What I'm hoping is that you can have small resets and ratchet back things enough to have a decent society without having to have a huge catastrophe. I mean, the kinds of catastrophe that can occur here are some of the vaccines will not be as safe as some others and so on. And there might be large numbers of reactions, very consequential health effects from these vaccines. This is a dangerous experiment, developing and applying a vaccine for something that's been with us for millions of years, which are these viral respiratory diseases.

Dr. Joseph Mercola:

I would have to disagree with you there. You said there might be, I would just slash if I was editing that statement, make a giant block or smite and insert will be an untested vaccine that

bypass all the safety trials and is rapidly through Operation Warp Speed designed to be given to tens, hundreds of millions of people. It's untested. It's not like they haven't been trying to work on coronavirus vaccines for over a decade and failed miserably. It's a really challenging project. And to do something in a year or less, it is virtually impossible not to have a vaccine that's not going to cause loads of complications far worse than anything it's going to prevent if it is possible to prevent this through a vaccine mechanism.

Denis Rancourt:

That's right. The question of whether it's possible or likely or effective is a good one. The thing that disgusts me the most is that they're going to vaccinate, do mass campaigns of vaccination in equatorial countries, in Africa where these diseases do not transmit. By the very physics and biology of the disease, they do not transmit in equatorial countries. There's a narrow band of latitudes where they transmit where this is an issue, but it's not equatorial continents. And so you do not go in and get the public to pay corporations to develop vaccines to vaccinate everyone in Africa and using cut-rate methods for making these vaccines because you can afford to use cheaper methods when you're only selling it to other nations and the United States and so on. It's disgusting, it's immoral, it's really-

Dr. Joseph Mercola:

You know what's even more frightening? It is not new, they've done it before. I don't know if you looked at the history of HIV (human immunodeficiency virus), but there's really strong evidence that it was brought into the human population because of just this process. They developed polio vaccines based on infected monkey cells that they used to grow up these vaccines and give it to these people in Africa. The monkey cells were contaminated with SIV, Simian Immunodeficiency virus, which is a distant cousin of HIV. And that transmitted, jumped the species. To me, this appears to be the strongest evidence of how HIV got into our population, from this very same process.

Denis Rancourt:

I haven't studied HIV, but I have looked at the scientific literature to know that there are some huge controversies related to HIV and the cause of HIV that are in the peer-review literature, I know that. Sorry, I forgot what I was going to say next.

Dr. Joseph Mercola:

Well, it's just the problems with the vaccine, so it's a whole separate issue. But what I really appreciate the framing of how allowing yourself to capitulate and surrender to these orders to wear a mask is actually increasing your risk or increasing not your risk, but the cultural risk of having an imposed mandatory vaccine.

Denis Rancourt:

Oh, there's no doubt about that. We live in a crazy world, and I've been writing about it for many years. We could just expand this into many, many areas of medicine and society and technology and so on, but we do live in a world where we are just being exploited and manipulated for profit and control. Control more than profit actually because it's been demonstrated-

Dr. Joseph Mercola:

Guys like Gates don't need any more profit, they want the control. It's very clear for that. So it's more than money.

Denis Rancourt:

There was a very interesting study that was done by a renowned historian of science and technology who was my friend, he's passed away now. David F. Noble wrote books about how control is implemented in our societies. And he demonstrated that many big corporations in the USA like IBM and Bell Labs and so on and big manufacturers that when they had occasions to make higher profits but that involved giving workers more say and more freedom, they would prefer to sacrifice profits in order to have a tighter top down control of the workforce. So he demonstrated many examples of that in his books, "America by Design: Science, Technology and the Rise of Corporate Capitalism," and so on. So there's plenty of historic demonstration of that, that the control is more important than actual profit.

Dr. Joseph Mercola:

Thank you for giving us all this great information and really a primer helping us understand why masks may not be the best solution, in fact may be a really bad choice if you're concerned about even worse totalitarian measures that's going to be implemented by the government. So I'm wondering if you'd like to give us a summary or emphasize certain points that you went over.

Denis Rancourt:

I wouldn't know how to summarize, we've been talking for quite a bit.

Dr. Joseph Mercola:

What is your main recommendation?

Denis Rancourt:

My main conclusion is that there was no extraordinary virulent viral pathogen causing a respiratory disease, it did not happen. You can see it in the hard facts, the fact that the winter burden all-cause mortality is not any different than it has been for many decades. There is a signature that government actions, government responses to the declaration of the pandemic accelerated deaths of the most vulnerable people that were at highest risk of the seasonal viral respiratory disease, but there is no special danger this season. So it has been fabricated manipulation and profiting off of the idiocy of our society, which has been largely created by continually asking us to be compliant with ridiculous things and continuously pumping out the propaganda through our institutions, through the mainstream media and so on. So this is what has just happened, and it's shocking.

Dr. Joseph Mercola:

But let me just tease out a detail on that because it would seem that this is indeed a particularly virulent pathogen, at least from my review of the evidence. It's a distinct clinical entity that's given a name, COVID-19, that seems to have different characteristics than traditional flu in predisposed populations, specifically those who have insulin resistance and are vitamin D-

deficient. That's the dynamic duo that just makes you a sitting duck for this illness that you're going to get this massive inflammatory response which results in cytokine storms, it has thrombogenic side effect that the normal upper respiratory infections don't ever encounter. You're not denying, there's clearly-

Denis Rancourt:

I've read it enough to come to my own conclusion, which is probably most of that is scientists and practitioners convincing themselves that they have a new and very special thing. I think if you were to study the deaths due to influenza, for example, in a given hospital at a given time, there are always more deaths in certain places than others. If you were to put the same effort and offer the same through propaganda, offer the same incentive to medical researchers and scientists to be able to claim new discoveries and to claim that something really special is happening, you would get about the same result. That's my sense of it.

Dr. Joseph Mercola:

There well could be, anything is possible and no one knows the full spectrum. But it does seem to be a particularly pathogenic illness. And we're looking a lot, there's another controversy as to the origin of this virus. It is clear that the traditional statement that this is zoonotically transmitted is just a bunch of hogwash. I mean, there's so much evidence now that's kind of racked in. In fact, we're in the process of conducting campaigns and doing foyer requests and everything to get many of these BSL-3 and 4 BSL-4 labs shut down.

Denis Rancourt:

I always come back to the same thing, the winter burden all-cause mortality is no different than it's been for the last many decades. I always come back to that. That's a hard fact. So we're not talking about a nuclear war, we're not talking about a massive earthquake. We're not talking about a truly virulent pathogen that has caused enormous amount of deaths where you actually know people who have died from it. We're not talking about anything like that. It has been in terms of all-cause mortality numbers, this has been a regular season statistically no different than others. The only thing that's been different is this incredible campaign and the very aggressive government actions that have been harmful.

Dr. Joseph Mercola:

Difficult to argue with that and especially down the road. Now, some people may argue with it, but when we get this behind us, you're going to retrospect fully at this, you're going to do a face-plant and say, "I can't believe I let them get away with this." So anyway, thank you for all the information, hopefully it will inspire some civil disobedience with respect to mask-wearing.

Denis Rancourt:

It was my pleasure to have this wide ranging discussion. That was a lot of fun. Thank you very much.