

Speaker 1 ([00:01](#))

I'm a professor of orthopedic surgeon here in the division of spine surgery, having moved out here a few years ago from when I was back at Mass General in Boston. So Gardinium(TM). As you know, the history of spine surgery, especially instrumented spine surgery, can be listed and described as some very important leaps and bounds over the decades, starting with the introduction of Harrington Instrumentation by Dr. Paul Harrington back around 1960, which completely changed the way we took care of spine and spine deformities, especially in the young and the vulnerable. And then as we went into the suddenly we got introduced not only the concept of a change in materials from the stainless steel that we used, but also the techniques that we use, moving into titanium and cobalt chromium, but then not just a hook above and a hook below, as was the Harrington rod.

Speaker 1 ([01:09](#))

But suddenly we're now adding lots of different forms of fixation, from wires to hooks to pedicle screws. But what has long been a problem is, no matter what kind of situation or material that we have is the concept of no matter how good the surgery can be and how diligent we are from start to finish, risks of rod breakage and more importantly, risks of infection still exist, especially in the large multiply operated on surgeries for especially spinal deformity. The mechanical strength of Gardinium(TM) is similar to that of the other stainless steel implants. And for that, it is perfectly compatible, we believe, with just about anything that a spine surgeon is going to want to do. So what surgical instruments would benefit most from Gardinium(TM) instead of using stainless steel?

Speaker 1 ([02:14](#))

Well, certainly the implants that we use, whether they be the screws or the rods or the hooks, but also some of the instruments that we use in the course of the operation, such as the retractors that are placed there, oftentimes for hours at a time, risking damage to the muscle tissue surrounding it. The elevators, the cob elevators that we use relentlessly to expose the spine. Things like this can be fashioned out of this new biomechanically strong metal alloy and can be very applicable to just about any surgery out there. Those who would be most useful for thus are going to be those who are at highest risk for infection or complication. Those would be anyone at risk, the elderly, those who are being operated on revision surgery, having had previous operations.

Speaker 1 ([03:24](#))

It is polymicrobially effective. In other words, no matter what comes in contact with this metal from an organismal standpoint, be it viral or bacterial or fungal, et cetera, et cetera, the mechanism of biologic degradation begins with taking a part of that organism cell wall. And for me and others, for example, who work in large tertiary referral centers such as Stanford, where people come from so many different places, so many different backgrounds, so many different previous surgeries in different states of health and welfare. It's vitally important to be able to concentrate on so many other things other than what you're doing. To eradicate the chance of infection popping up or infection recurring.

Speaker 1 ([04:21](#))

And that in and of itself is an outstanding feature because in the current times, we do take care of so many people who have had infections themselves in the past, and we're cleaning it out as best we can, but we're trying to stabilize the spine and instrument it. And the last thing you want is a material that's going in there that might risk pose the risk of recurrent infection, and Gardinium(TM) tackles that task dramatically.

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There are many surgical robotic platforms. Most robotic platforms are associated with hardware insertion. We have yet to develop a system that reliably manipulates the spine during surgery. The Teslake robot does this.

The Teslake robot system will offer me as a surgeon, the ability to control sub-millimeter movement during spinal deformity correction. And more importantly, the technology involved can actually detect bone failure during manipulation and alert the surgeon that less force would be required in that patient.

The Test Lake robotic system is connected remotely through artificial intelligence. And the system learns as more cases are performed. Patient factors such as bone density, medical comorbidities are being collected and analyzed by artificial intelligence to perfect the exact amount of force required to perform manipulation and spinal deformity.

This enhances the ability of the surgeon to safely manipulate the spine, especially in our aging population. The Test Lake Robot offers the surgeon the ability to have sub-millimeter control. of the spinal manipulation during surgery. This is a precision and a control that is not available to human touch.

It will enhance the surgeon's ability to safely perform manipulations in spinal deformity patients. Spinal manipulation is commonly performed in both spinal deformity surgery and degenerative spinal conditions.

Simple screw distraction where we spread the disc base by spreading screws apart, places some patients at risk for bone failure and future loosening and pseudoarthrosis. The Teslake robot can detect bone failure in a way that a human hand cannot.

And it may protect our especially elderly patients from screw loosening and subsequent pseudoarthrosis.



Teslake Logo animation.

Dr. Tung Nguyen Speaking:

"My name is Tung Nguyen I'm a board-certified neurosurgeon I practice in a multidisciplinary group at Southern New Hampshire Medical Center in Nashua NH. I've been doing neurosurgery for almost 20 years and umm I specialize in brain tumors but do basically general neurosurgery."

During Video Text Appears:

"Tung Nguyen, MD, FAANS. Board-Certified Neurosurgeon Southern New Hampshire Medical Center Nashua, NH."



Video of Dr. Tung Nguyen:

Dr. Nguyen Speaking:

"if you think about an operating room the tables one or two layers it's exposed to air there are people coming out of the room air flow is uncertain should be negative pressure but people it's from traffic throughout the room air circulation and unsterile technique so there's a variety of factors that could contaminate your tray your instruments."

Text Appears Sources of Contamination

Images appear during video above: Instrument table 1, Instrument Table 2, Operating Room, People in Operating room 1, People in Operating room 2, People in Operating room 3, Instruments on Tray.

Dr. Nguyen Speaking:

"so for a surgeon surgical site infection is a major concern it's everything, it's something that we think about constantly to try and prove whether it's surgical technique surgical instruments it is a huge problem in terms of taking patients back morbidity and not even thinking about the cost to the health system so just patient outcome and patient safety "

Text Appears Surgical Site Infections Are a Major Concern.

White Screen appears

Text Appears:

Every day in the U.S. 250-300 people will die from a hospital-acquired infection.

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528178/#:~:text=Healthcare-associated infections \(HAIs\),major problem in hospitals worldwide.&text=The Centers for Disease Control,obtained from multiple healthcare databases.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528178/#:~:text=Healthcare-associated infections (HAIs),major problem in hospitals worldwide.&text=The Centers for Disease Control,obtained from multiple healthcare databases.)

Every day in the U.S. 250-300 people will die from a hospital-acquired infection.

1 in 5 deaths Worldwide are due to sepsis.

In fact, every 90 seconds, someone will die from Sepsis.

Sepsis is the #1 cause of death in U.S. hospitals today.

Images Appear: Dr & Patient holding hands

Text Appear: Patient Outcomes & Patient Safety



Potential Applications of Guardinium™

Video of Dr. Tung Nguyen:

Dr. Nguyen Speaking:

so anything that is close to the patient during surgery so the material that the light handles made-up the bed the retractor frame for during surgery suction tubing suction tips you know my loops anything like that that is in close proximity to the patient or you can reduce the likelihood of contaminating the patient and increasing the risk of infection I would certainly use coated instrument like Guardium.

Text Appears Potential Applications of Guardinium™

Images appear during video above: Surgical Clinical Lights, Hospital bed, Retractor, Suction Tubing, surgical loops, Patient on Operating room table.



“Having a product that could potentially significantly reduce surgical site infection is a major development and something I would definitely use.”

Spine Centers of Excellence

Video of Dr. Tung Nguyen:

Dr. Nguyen Speaking:

“as a surgeon one of the things we really worry about is surgical site infection as we move towards being Spine Centers of Excellence one of the measurements of our success is whether we can minimize surgical site infection and you know we want to make sure the patients do well no complications that's you know separate from the huge cost of surgical site infection to the health system as in general so having a product that could potentially significantly reduce surgical site infection is a major development and something I would definitely use.”

Text Appears Having a product that could potentially significantly reduce surgical site infection is a major development and something I would definitely use.

Text Appears: Spine Centers of Excellence



Guardinium™

A permanent antimicrobial alloy

Text:

Guardinium™

A permanent antimicrobial alloy



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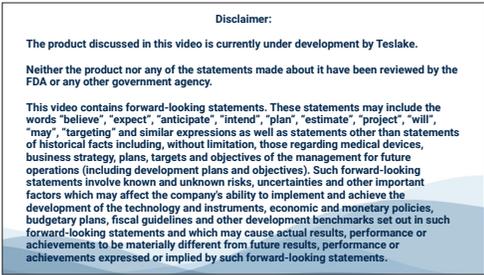


Teslake Logo animation

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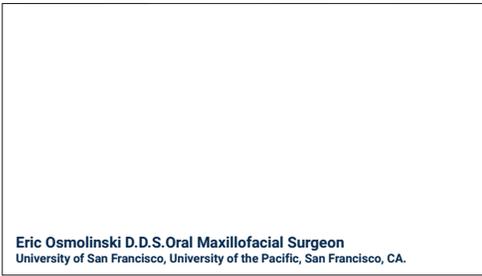
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Music ends



Teslake Logo animation.



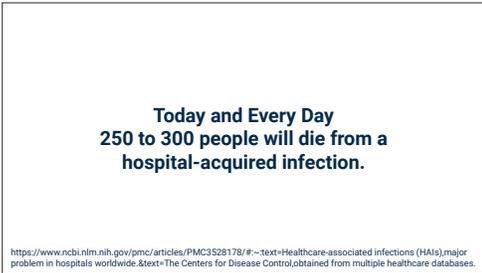
Video of Dr. Eric Osmolinski:

Dr. Eric Osmolinski Speaking:

"I am Eric Osmolinski I am a oral maxillofacial surgeon I am in private practice in Northern California and the eastern university of San Francisco I also practice the university of Pacific and serve the entire community with some procedures that are private practice based and hospital-based full scope oral maxillofacial surgeon

During Video Text Appears:

Eric Osmolinski D.D.S. Oral Maxillofacial Surgeon
University of San Francisco, University of the Pacific, San Francisco, CA.



Video of Dr. Eric Osmolinski:

Text Appears:

Today and Every Day
250 to 300 people will die from a
Hospital-acquired infection.

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528178/#:~:text=Healthcare-associated infections \(HAIs\),major problem in hospitals worldwide.&text=The Centers for Disease Control,obtained from multiple healthcare databases.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528178/#:~:text=Healthcare-associated infections (HAIs),major problem in hospitals worldwide.&text=The Centers for Disease Control,obtained from multiple healthcare databases)

Dr. Eric Osmolinski Speaking:

"Today and Every Day 250 to 300 people will die from a hospital-acquired infection."



Video of Dr. Eric Osmolinski:

Text Appears:
#1 Cause of Death in United States Hospitals

1 in 5 Deaths Worldwide are due to Sepsis.

Someone in the US Will Die from Sepsis Every 90 Seconds.

Dr. Eric Osmolinski Speaking:

"1 in 5 Deaths Worldwide are due to Sepsis and is the #1 Cause of Death in United States Hospitals, in fact, someone in the US will die from sepsis every 90 seconds."



Video of Dr. Eric Osmolinski:

Dr. Osmolinski Speaking
"The economic cost to the nation's healthcare system is staggering."

Text Appears:
The Economic Costs to the Nation's Healthcare Systems are Staggering.
<https://hcup-us.ahrq.gov/reports/statbriefs/sb261-Most-Expensive-Hospital-Conditions-2017.jsp#:~:text=In 2017, aggregate hospital costs,myocardial infarction, and heart failure>

Dr. Osmolinski Speaking
"Infection is the #1 Cost of Hospitalization in the United States."

Text Appears:
Infection is the #1 Cost of Hospitalization in the United States.
<https://hcup-us.ahrq.gov/reports/statbriefs/sb261-Most-Expensive-Hospital-Conditions-2017.jsp#:~:text=In 2017, aggregate hospital costs,myocardial infarction, and heart failure>

Dr. Osmolinski Speaking
"Billions of dollars in hospitalization and skilled nursing costs are spent annually"

Text Appears:
Billions of Dollars on Hospitalization and Skilled Nursing Costs are Spent Annually.

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9949640/#:~:text=HAIs not only led to,public health system \[8\].](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9949640/#:~:text=HAIs not only led to,public health system [8].)

The Scientists at Teslake have invented a technology to help fight this terrible crisis.

Video of Dr. Osmolinski:

Dr. Eric Osmolinski Speaking:

"The Scientists at Teslake have invented a technology to help fight this terrible crisis.."

Text Appears:

The Scientists at Teslake have invented a technology to help fight this terrible crisis.



Video of Dr. Eric Osmolinski:

Dr. Osmolinski Speaking:

"Here's the good news! It's called Guardinium. It's an alloy that when it comes in contact with bacteria virus or fungal the microbes immediately become eradicated. It attacks the cell wall of the microbe and destroys it. Guardinium does not discriminate against bacteria, virus, or any fungi and has been proven to kill them all."

Text Appears

Here's the Good News!
Guardinium™

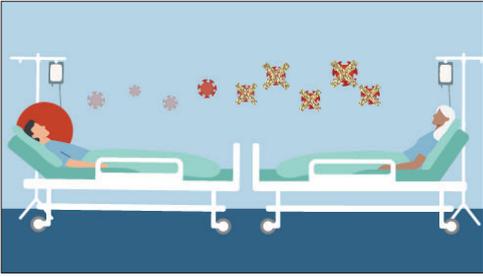
Images appear during video above: Bacteria, Virus, Fungi

Text Appears

Prevent to Kill bacteria and Viruses

Christophe Espirito Santo,^{1,2} Ee Wen Lam,² Christian G. Elowsky,³ Davide Quaranta,² Dylan W. Domaille,⁴ Christopher J. Chang,⁴ and Gregor Grassl.² 2011. Bacterial Killing by Dry Metallic Copper Surfaces. APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Feb. 2011, p. 794–802 0099-2240/11/doi:10.1128/AEM.01599-10

Warnes SL, Little ZR, Keevil CW. 2015. Human coronavirus 229E remains infectious on common touch surface materials. mBio 6(6):e01697-15. doi:10.1128/mBio.01697-15.



Video of Dr. Eric Osmolinski:

Dr. Osmolinski Speaking:

"Guardinium in my oral and maxillofacial surgery practice, my use for it would be on every single surface that instrumentation would be placed. It would be placed on surgical components chairs like ID polls, on top of the monitors. Anything that would be touched with the human hand, the door handles coming in, and leaving, computer terminals, keyboards, desktops, anything that would be potentially a source of spread of infection, bacteria fungi or virus, and prevent that spread from one patient to another."

Images Appear: Hospital equipment clipart, Dental Instruments, Dentist Chair, IV Poles, Hospital Hallway, Door Handle with gloved hand, Nurses station.

Image Appears : Clipart of patient transmission.

Animation: Guardinium "X" eradicating microbe images to other patient.

Guardinium™

A desperately needed solution and mission with a heart.

Text appears:
Guardinium™

Dr. Osmolinski Speaking:

"A desperately needed solution and mission with a heart."

Text appears:

A desperately needed solution and mission with a heart.

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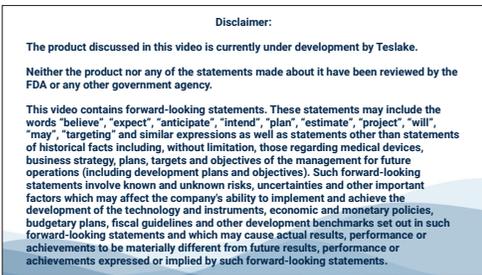
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