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ULTRAVISION

Dr. Ramon E. Yera

Minimally Invasive GYN Surgeon

The Yera Group

Education / Career History

Pepperdine University

UC Irvine Medical School

Residency Kaiser Permanente, Los Angeles

Instrumental in developing the minimally invasive gynecological surgery program at Kaiser

Performed over 5000 laparoscopic procedures with extensive experience in Total Laparoscopic Hysterectomy, Laparoscopic Myomectomy, Laparoscopic Sacrocolpopexy, Laparoscopic Cystectomy and Advanced Operative Laparoscopy for Endometriosis

Proctors surgeons nationally in MIS GYN procedures

Supports surgeons in Southern California at 10 different centers

Continues assisting at Kaiser Fresno on complicated cases

Major Certifications/Memberships

American Board of OB/GYN Certified

Active member of AAG

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ULTRAVISION

Dr. Yera Discusses Ultravision

Dr. Ramon E. Yera completed his residency and spent more than 18 years in partnership at Kaiser Permanente, where he completed 3,000 minimally invasive surgery (MIS) Gynecologic procedures. He now travels nationally, proctoring surgeons and teaching complex procedures. He still assists monthly at Kaiser Permanente on complicated cases.

After an initial trial, Dr. Yera has completed more than three hundred procedures with Ultravision and uses it in every OR in which he operates. Dr. Yera cites physiological, psychological and fiscal benefits for the Patient, Staff and Hospital. In this interview, he discusses his experiences with the system and explains why he frequently describes Ultravision as a "Game Changer."

What was your first impression of Ultravision?
I trialed Ultravision in 2019 at Kaiser Permanente in Fresno after initially seeing it at AAGL's annual conference. From the start, I felt Ultravision was truly a game changer. Unlike other products, it doesn't evacuate smoke, it actively eliminates it from the pneumoperitoneum. That provides me with much better visibility, with less camera fogging and a more efficient procedure. By not venting smoke into the OR, Ultravision protects the long-term physical health of the entire OR staff, as well as offering the immediate psychological benefits of peace of mind. The other significant advantage is that surgeons can operate using much lower CO_2 pressure and volume. I believe, and I have seen, that this results in a range of benefits for the patient, including less post-operative pain. For example, when performing total laparoscopic hysterectomy at low pressure using Ultravision, many of my patients can go home on the same day, without requiring an overnight stay. I am also convinced that it results in reduced patient peak ventilatory pressure when in steep Trendelenburg positioning. Many of my patients have high BMI and I believe that this is truly beneficial for them, both in recovery and for their long-term health. This could open up a whole new area of clinical research and change the paradigm of laparoscopic surgery.

Can You Explain what you mean by "Smoke Elimination" versus "Smoke Evacuation"?
First and foremost, smoke created in laparoscopic surgery limits the surgeon's vision. To improve the view, we need to remove the smoke. We do not vent into the OR because of concerns over what is in the smoke and its impact on the staff. Prior to adopting Ultravision we were evacuating the smoke from the abdominal cavity by one of two methods: a "passive system"—essentially a tube that went into a filter—or an "active system", involving a suction device outside the patient's body. Both methods were inefficient at removing the smoke and clearing the view. As a result, there is also constant leakage of smoke into the operating room, which is not healthy for the OR staff. The removal of CO_2 also means that there is loss of the pressure that we need in laparoscopic procedures to operate safely and efficiently. This is problematic because we have unstable pneumoperitoneum, which makes the procedure more complex and take longer. Conversely, Ultravision doesn't evacuate the smoke but actively eliminates it within the abdomen. It does this by emitting negatively charged ions from a small electrode. These ions precipitate the water vapor that contains the smoke within the abdominal cavity. The visual field is cleared in a second or two, with no leakage into the OR. And, because there is no continual exchange of CO_2, you can operate at lower CO_2 pressure and volume.

Let's discuss the issues surrounding smoke escaping into the OR and the threat that may present. Can you explain?
It is not easy to remove smoke through the small apertures and tubing used in laparoscopic surgery. This means that when a procedure is being done with standard smoke evacuation, because these systems are not airtight, a certain percentage of smoke-containing CO_2 will be disseminated into the operating room. Unfortunately, this smoke contains pollutants that can be toxic as a result of long-term exposure. I'll give you an example, the smoke from cauterizing just one gram of tissue is roughly equivalent to smoking 6 cigarettes. Obviously, this is a concern not only for the surgeon, but also the staff. Remember, they can be in there for 8 hours at a time.

Then there's the question of infection risk from biological agents such as viruses. Obviously, we're in a pandemic so there is a risk that the SARS-CoV-2 virus may be present. HIV, the HPV virus and hepatitis are also possible – just to name a few. And this is all evidence-based and published in the literature. So much so that many states are looking at having legislated "No Smoke" ORs to protect the health of the staff. With Ultravision, the active elimination of the smoke from the pneumoperitoneum atmosphere is very efficient at minimizing its release into the OR.

What is the reaction of the surgical teams you work with, in Ultravision procedures?
A) The psychological benefit of knowing that smoke is not being released into the room is very, very big - especially in this day and age of the ongoing pandemic. As a surgeon, and for many team members, you feel better knowing you are not going into a smoke filled OR for 8 hours a day, day in and day out. Staff members definitely notice a difference. In a smokey case, at the very least you can smell it. You can even smell it outside the OR, that's how significant it is. It's definitely a big problem and a huge concern – and Ultravision is helping to address it.

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Let's consider the use of CO_2 and the issues surrounding CO_2 pressure. What are the benefits here?
In a laparoscopic procedure CO_2 is used to facilitate access to and visualization of the surgical site. In a non-Ultravision surgery, to facilitate the ability to see clearly, the CO_2 containing the smoke has to be evacuated from the body. To maintain the pressure, fresh CO_2 is simultaneously pumped in. The evacuation is done in two ways. One is an active method that involves a suction device outside the patient's body. You can control the evacuation by increasing the suction. The insufflator has to keep up and provides fresh CO_2 to maintain pneumoperitoneum, which also dilutes the remaining smoke in the abdomen. The downside is that you have to maintain a much higher CO_2 pressure to start with, to compensate for the lag between the smoke-containing CO_2 being evacuated and the fresh CO_2 being pumped in. The second evacuation method involves an open port and a filter which uses the pressure of the pneumoperitoneum to passively remove smoke-containing CO_2. As you can well imagine, this is a slower process and still requires CO_2 replacement.

Typically, the amount of pressure that we use in a standard laparoscopic operation is 15 mmHg. We use that pressure to be able to facilitate the surgery so that we can see because we know that when we evacuate smoke that pressure will go down to below 5mmHG before the insufflator catches up. That's significantly high pressure. For certain patients, specifically the morbidly obese patient, it becomes a huge concern because we need to operate in a Trendelenburg position where the patient is essentially head down. In these patients, this translates to much higher ventilatory pressures. Specifically, the ventilator has to work a lot harder to ventilate the patient because of the high-pressure CO_2 and the significant Trendelenburg positioning needed to bring the intestines out of the way so we can operate in the pelvis. Often the ventilatory pressure is so high it becomes a concern, specifically for the anesthesiologist who is ventilating the patient.

This causes a significant amount of barotrauma to the lungs and you can't safely achieve those extreme Trendelenburg positions. This makes undertaking the procedure very, very difficult in certain cases. The beauty of Ultravision is because there is no exchange of CO_2, you can actually operate at a much lower pressure of typically 8 to 10 mmHg – in other words, 5-7 mmHg less – and use far less CO_2 overall. I have witnessed much lower end-tidal CO_2 levels, reduced ventilatory pressures and better oxygenation for the patients when operating using this technique. This all translates into being able to do the case in a more efficient way, that I believe, is safer for the patient. It is not only relevant to obese patients. It actually helps patients with other comorbidities, especially lung diseases and cardiovascular diseases, where you want less stress in the whole cardiopulmonary system while you're doing the surgery.

The other significant thing is that by operating at low pressure/low volume there are now studies in gynecology that have demonstrated that you actually decrease pain – specifically in the shoulder from referred pain to the phrenic nerve – and enhance postsurgical recovery.

What about the drying effect CO_2 can have on tissue?
With the most common insufflators, the CO_2 gas that comes in is dry and cold. When used in excess, this cold, dry CO_2 can have local and systemic consequences for the patient. The excess use is often a result of having to remove the smoke-containing CO_2 that accumulates during the procedure and replace it with fresh CO_2. Recognizing this, there are now insufflators that deliver heated and humidified CO_2 - but they come at a much higher cost. The beauty of Ultravision is that because there's no exchange of CO_2 required to maintain a clear view, total patient CO_2 exposure is dramatically decreased. It follows that reducing the ongoing introduction of cold CO_2 should lessen the impact it has on the patient and it also results in less camera fogging.

You mentioned Ultravision can make procedures more efficient. Can you expand on how it does that and the resulting benefits?
First, by doing such an efficient job in maintaining a clear visual field, Ultravision allows the surgeon to see better and operate much faster. The smoke elimination happens in a second or two instead of having to wait the longer times you experience with smoke evacuation in a non-Ultravision procedure. Second, because you introduce less cold CO_2 you reduce camera fogging. You do not have to remove your scope, clean it and put it back in anywhere near as often. That sounds trivial, but over a long procedure that can save a tremendous amount of time. Not to mention the break in concentration that can occur if you have to stop and clean the lens, especially if you are in an important part of the case where you have a bleeding situation that you have to control, or if it is a difficult case in general. Having to stop repeatedly to clean the lens can be challenging. With Ultravision that's not really a concern.

For the staff, there is a fatigue factor that sets in during longer cases. Anything you can do to safely shorten a case is a benefit. For the patient, reducing the procedure time—and the amount of time under anesthesia—can translate into a much better result and improve the patient's recovery.

There are also benefits for the hospital. There have been numerous studies to determine how many dollars-per-minute OR time is worth. Looking at this fiscally, the hospital is going to save a lot of money by shortening procedure times.

Overall, it sounds like a win-win-win for the hospital, staff and patient, but are there concerns about the smoke that's left in the patient's body?
I'd be more concerned if that patient was being exposed 8 hours a day, day after day, but for one surgery, surgical smoke is not likely to show a deleterious effect for the patient. I have used Ultravision in hundreds of cases and in fact now use it in every OR that I operate in. We have not seen any deleterious effects on the patient from smoke left behind. In fact, by developing the technique that we use with Ultravision, I believe the patient benefits are compelling.

If you were talking to a hospital CFO, what would you want him or her to understand about Ultravision?
I'll give you a true event that happened to me. We trialed Ultravision at a hospital and even though it is not a particularly expensive item, the CFO was hesitant because he just didn't understand why it was needed. I responded with all the benefits for the patient, including lower pressure, shorter procedure time, less trauma and improved recovery; for the staff, explaining there will be less smoke escaping which translates into a healthier environment; and for the hospital, with shorter procedure times saving money. The point being the hospital needed Ultravision because it is a game changer. In my opinion, the only complete package that is benefiting everyone. Looking at the whole picture, he saw the value and agreed to purchase it.

Finally, what would you want all your colleagues to understand?
I would want them to understand Ultravision is actively eliminating surgical smoke from the pneumoperitoneum, not evacuating it. As the surgeon, this means that they are going to be able to operate at a much lower CO_2 pressure and volume – they will understand the benefits of that immediately because time and time again they have had patients with comorbidities or high BMI where they had to abort the laparoscopic case because the patient couldn't be well ventilated. Now you are going to be able to do these cases laparoscopically in a MIS approach, which is what we are all striving to do for the benefit of our patients. Also, it's going to help you and the staff to have less risk from smoke inhalation. As surgeons, we have all been there and have all experienced a smokey case where you have to inhale all that smoke.

Ultimately, I would want my colleagues to understand that Ultravision is a no-brainer – If you haven't tried it, it's really worth at least trialing and seeing for yourself what an asset it can be.