May 1, 2025 Patient Education Webinar- “Biopsies Save Lives: Pemphigus, Pemphigoid, and Oral Care"

Becky Strong: Welcome everyone. I'm Becky Strong, IPPF Outreach Director, and I'm so glad you're joining us today. Before we dive in, just a quick reminder that this webinar is being recorded. “Information is absolutely essential when it comes to managing and living with any condition, but remember, everybody's journey is unique. The IPPF encourages you to always check with your doctor or healthcare team to make sure the information you hear today applies specifically to your situation”. Now onto the exciting part. Today we're thrilled to have Dr. Mark Mintline with us to talk about “Biopsy Saves Lives: Pemphigus, Pemphigoid and Oral Care”. So let me introduce you to Dr. Mintline. Dr. Mark Mintline is an Associate Professor at the Western University of Health Sciences, Western U College of Dental Medicine in Pomona, California. He is the founding laboratory director of Western U Health Oral Pathology Laboratory and the co-founder of the Advanced Oral Diagnostics Work Group. Dr. Mintline is committed to increasing access to oral healthcare services at Western U and serves as the Director of the Biopsy Saves Lives, Oral Biopsy Saves Lives, and the Ryan White Part F programs. Dr. Mintline received his doctor of dental surgery degree from UCLA School of Dentistry. He completed his residency in oral and maxillofacial pathology at the University of Florida College of Dentistry. Dr. Mintline is a diplomat of the American Board of Oral and Maxillofacial Pathology and a fellow of the American Academy of Oral and Maxillofacial Pathology. Dr. Mintline is also the 2024 IPPF Doctor of the Year. **…Reviews Housekeeping Slides.** So now welcome Dr. Mintline.

Dr. Mintline: Thank you so much for the kind introduction. I'm going to just share my slide deck. Let's see. Alright, Becky, can everybody see the presentation?

Becky Strong: Yes, now I can.

Dr. Mintline: Perfect. Just as background, I am an oral pathologist. That's a dental specialist that works in a laboratory. We diagnose cases underneath the microscope, but we also work with clinicians, whether it's dermatologists or other dental specialists. Personally, I work at a dental school in Southern California. And I'm excited to talk about a program that we've started with the International Pemphigus Pemphigoid Foundation as well as the UCI Health Dermatology Clinic. The program's called Biopsy Save Lives and it works hand in hand with patients as well as Quest Diagnostics, Delta Dental and Henry Schein to provide no cost laboratory testing to accelerate diagnosis times. Becky sent me some questions from the audience and what I've done is created a slide deck to address most of these questions. As far as the layout of this lecture, we'll review the laboratory testing of pemphigus/pemphigoid as well as in the end talk about how to

manage these conditions in the oral cavity. And so all of this isn't necessarily just technical information, but it is good information as far as how these diseases manifest clinically.

Dr. Mintline: As background pemphigus and pemphigoid, there are autoimmune blistering diseases, meaning that our immune system produces autoantibodies that attack our skin cells that hold each other or different proteins that hold the skin cells together or hold our skin cells to our connective tissue. The reason it's important for a dentist to potentially recognize is that pemphigus initially presents most commonly in the oral cavity, about five out of six cases of four out of five cases on average. Unfortunately, patients living with pemphigus vulgaris have six to ten months worth of diagnostic delays because these are ultra rare diseases that may have large different clinical mimics. It can sometimes be very challenging to find a healthcare provider that's seen or recognized this condition. And then what makes it even more challenging is that we need specific laboratory testing to confirm the diagnosis. As far as a lot of this information, it is from the International Pemphigus Foundation's Natural History Registry as well as the National Organization of Rare Diseases.

Dr. Mintline: When we started the program Biopsy Safe Lives, we looked through the literature as well as we looked through the IPPF Foundation scientific conferences. In 2018, there was a nice perspective in Frontiers in Medicine that highlighted, at least as a community, the priority need was a quicker diagnosis. So we sought to develop a program that broke down barriers in the diagnostic and treatment pathways. And so IPPF prior to starting the Biopsy Save Live programs here at Western U and at UCI Health, they started to create a national campaign to help patients get this final diagnosis. The most important thing probably from a dermatologist point of view is that we don't necessarily stop with just an H&E diagnosis, instead, we work this up and have a complete diagnostic workup. Meaning that we prove that this is an auto antibody driven process either through blood work with ELISA or indirect immunofluorescence or with a tissue biopsy with direct immunofluorescence. This is a nice title slide from the IPPF website that goes through a series of questions for clinicians as well as patients to kind of help guide them to figure out whether they need further testing to work up for pemphigus and pemphigoid. A lot of folks in this audience, they may be at the very beginning of their diagnostic journey or they were just recently diagnosed, and so you can kind of imagine these specific questions. Do you have more than one blister or lesion in your mouth? Then you would consider doing separate biopsies. Have you had blisters or lesions that last for more than one week? Have you continually had blisters or lesions that don't heal? And then the final question, do you have blisters or lesions located in any locations outside the mouth? If you answered yes to three or more of these questions, you really should consider a biopsy. And as far as clinicians, it’s

important to potentially consider taking two biopsies. One for standard H&E that we would here on brightfield microscopy. The other one that we'd put into a separate transport media and review under direct immunofluorescence where we're looking to see if we can localize where these auto antibodies are.

Dr. Mintline: This particular program in southern California, it's called Biopsy Save Lives. It's named after the campaign started by the International Pemphigus and Pemphigoid Foundation. It's patient-centered because we work with folks from IPPF and it's an interprofessional program because we have dentists working with physicians, predominantly experts in immunobullous diseases. Through generous support from Henry Schein, Delta Dental and most importantly, Quest Diagnostics, we're able to provide no-cost laboratory testing and diagnostic services. So for folks that come into our different clinics, we can do the consultations, we can do the surgeries, we can do the laboratory workups to hopefully facilitate a diagnosis. In addition, we also connect patients once they're diagnosed to IPPF for different resources as well as support.

Dr. Mintline: Another thing that our program focuses on is the detection of oral and blistering diseases in people of color. For folks that are living in rural communities or persons of color, they seem to have a more delayed diagnosis, and it could be due to the fact that some of these diseases present a little bit differently or they may be more subtle or dusky in their appearance on pigmented skin. The other thing for rural patients, sometimes there could be access to care issues as far as, they're not necessarily specialists in the area that are familiar with these diseases.

Dr. Mintline: For this audience, I want to stress that dentists as well as dental specialists, oral medicine specialists, oral pathologists, periodontists, oral surgeons, they can help facilitate a diagnosis because they're experts at performing intraoral biopsies. Specifically, they can really help the dermatology team pin down the diagnosis of mucous membrane pemphigoid as well as get diagnoses for tricky pemphigus vulgaris cases. For example, cases that have already been treated with rituximab and may have inconsistent or negative serology. The other thing that dentists can do is that they can monitor the oral cavity for flare-ups as well as remission.

Dr. Mintline: As far as things that we've looked at with the IPPF as well as with the UCI Health Immunobullous Clinic is we've tried to figure out what are some of the major reasons for diagnostic delay. Because these are ultra rare diseases patients, they don't know about the diseases. In fact, oftentimes when we talk to them, they said, I was just hoping it would go away. I thought it was an allergic reaction. I thought it was an infection. Other barriers that patients may have is they may not necessarily have access to medical or dental facilities that can help give them care. Dentists, we've tried to address that by working with their students, they may lack the confidence discussing

these different diseases or they may not necessarily have the skillset to perform some of these intraoral biopsies. So part of our program is that our students shadow our dental specialists like Dr. Mirfarsi to see if they can perform these tissue samples independently once they graduate.

Dr. Mintline: Pemphigus and Pemphigoid, they oftentimes have different diagnostic workups depending on where you go to initially get them evaluated. On the left, most dermatologists, they tend to help try first diagnosing these diseases by taking blood work and they potentially look for these circulating autoantibodies through ELISA or they send this serum to a laboratory and the laboratory performs in direct immunofluorescence. A lot of cases of pemphigus, almost all cases of pemphigus can be diagnosed through blood work. However, in most cases a mucous membrane pemphigoid needs a tissue sample. And so dentists on the other hand, if you are potentially going for a workup on their side, they're going to predominantly do biopsies. Most commonly, dentists first do an H&E biopsy and then potentially do direct immunofluorescence. The bottom line is both approaches will potentially work, but in most cases, as a pathologist, we want both teams working together and we want blood work and biopsies. The bottom line is there is no, one size fits all approach, and oftentimes we need multiple modalities to get a more specific and correct diagnosis. And so that's why IPPF when they came up with this campaign Biopsy Save Lives, they recommended two samples, H&E and DIF, particularly for lesions that affect the oral cavity. The bottom line is we need some sort of evidence to prove that this is an auto-antibody driven process. The reason is, once you know the diagnosis firmly, you can move forward with treatment with dermatology and potentially even more importantly is once you have a confirmed auto antibody driven process, then you can present these reports to an insurance company to get access to lifesaving medications. Without laboratory confirmation that this is an autoantibody driven process, you may experience delays in treatment as well as getting the requisite medications.

Dr. Mintline: So let's kind of review from the other perspective, probably the clinical perspective of a pemphigus vulgaris case. So this was a case that came to our medical center, was a 40-year-old Hispanic female and she reported a three month history of blisters and ulcers and erosions of the oral cavity, and it was starting to spread to the oral pharynx. On skin evaluation she had flaccid blisters as well.

Dr. Mintline: As far as her medical history, it was unremarkable. She denied a history of cancer. She denied a history of recent respiratory infection, but because this was affecting her oral cavity, she had been unable to eat most solid foods and had reported only eating oatmeal. And what was interesting is that she'd already seen five different dental and medical providers trying to figure out what this disease or condition was.

Dr. Mintline: As far as her medications, a dentist had put her on amoxicillin, a penicillin, and had put her on clotrimazole, an antifungal, but unfortunately, neither of these seem to be effective at controlling these erosions and ulcers. The patient also reported no allergies.

Dr. Mintline: So here's how she presented to the medical center. We can see extensive ulceration of the tongue and buccal mucosa, hemorrhagic crusting of the lower lip, and as far as the dorsum of the tongue, heavy coating just because it's been so tender that we've had a lot of skin and food buildup on the top surface of the tongue. As far as these pictures, it was very, very tender. And as far as the clinical examination, she had what was called a positive nikolsky sign, meaning that her skin was so fragile that just lateral pressure to the mucosal surfaces induced tissue breakdown and blister formation. On her skin, she had these healing flaccid blisters. If we look at the image on the upper right, we can see just every day pressure from a bra strap could induce a blister. We can see on the picture on the bottom left that some of these ulcerations are spreading to the soft palate, the uvula, and she was starting to experience pain in the throat area.

Dr. Mintline: As far as the differential diagnosis, because we had extensive ulcerations, crusting of the lower lip as well as flaccid blisters on the skin, we were thinking to ourselves, could this be a chronic autoimmune blistering disease, AKA and immunobullous disease? Based on the severity of the presentation as well as how these blisters were forming, we favored pemphigus vulgaris, however, we also considered other entities that we'd like to rule out. Based on our differential, we followed the IPPF rule as far as we wanted to do tissue samples for H&E as well as DIF, but we also wanted to cover serology as well so we also did ELISA.

Dr. Mintline: As background, pemphigus vulgaris is a chronic autoimmune blistering disease where we have circulating autoantibodies attacking the cadherin proteins, holding our individual mucosal and skin cells together. What's unique about this particular blister formation is that the blister forms above the basement membrane zone above the basal keratinocytes and intraepithelial blister. The different proteins these autoantibodies target are desmoglein 1 and desmoglein 3. We see desmoglein 3 much more in mucosa and oftentimes we see oral cavity manifestations first.

Dr. Mintline: Here's a nice electron photomicrograph of these desmosomal proteins. We can see that they almost act as steel cables that hold the individual cells together. And what's interesting about pemphigus vulgaris is that we have autoantibodies clipping these extracellular domains. What happens is these cells then physically separate and they're very, very tender and they're very, very vulnerable to pressure and breaking apart.

Dr. Mintline: In our program, Biopsy Saves Lives, it is patient-centered as well as collaborative with multi disciplines. So we worked with oral medicine, we also worked with the medical department. One of our students was recently trained as a phlebotomist, so she did the blood draw for our patient and then Dr. Mirfarsi, our oral medicine specialist, did the tissue samples.

Dr. Mintline: The laboratory testing that we wanted to order. The blood draw was sent to Quest Diagnostics for no cost, and what we were looking for was these circulating autoantibodies. If it's positive for pemphigus, it should theoretically be positive for anti-desmoglein 3 and potentially anti- desmoglein 1. For biopsies, we're taking two separate samples, one for routine microscopy, which we read here at the university. The second for direct immunofluorescence, a specific laboratory test where we're able to visualize where these autoantibodies are AKA where they're causing destruction. Based on these patterns that we see underneath the microscope, we can help separate different disease processes.

Dr. Mintline: As background, the reason that dermatologists are expert and so good at diagnosing pemphigus vulgaris is because one, they're very accustomed to recognizing the clinical signs, and two, serology basically is an excellent screening tool for this particular disease. Here's a nice research paper from 2000 that basically said that patients that have been untreated with pemphigus vulgaris, pretty much a 100% of them can be diagnosed through ELISA. And so if you suspect pemphigus vulgaris, ELISA can be a very, very powerful tool if the disease has been untreated AKA, they haven't been treated yet with corticosteroids or immune modulating medications.

Dr. Mintline: As far as this particular patient, anti-desmoglein 3 auto-antibody levels were extremely high, so this confers the diagnosis of pemphigus, but let's use clinical information. Let's use direct immunofluorescence and H&E if we can potentially subcategorize what type of pemphigus.

Dr. Mintline: As far as the different types of pemphigus in the oral cavity, the most common types that we need to consider in the laboratory are pemphigus vulgaris as well as paraneoplastic pemphigus. Very rarely paraneoplastic pemphigus can present in the oral cavity where it's associated with an underlying tumor or malignancy.

Dr. Mintline: As far as how Dr. Mirfarsi and the oral medicine specialists take these biopsies, we want to make sure that these samples are taken from an area that isn't already ulcerated or broken down. The idea is underneath the microscope, we want to see how the tissue is falling apart or forming these blisters. If we were to take a sample directly from that yellow patch, it's almost like a wet scab. That area is already missing the mucosa. So when we look underneath the microscope, we can't necessarily tell how it's falling apart. So per lesional, we want to get a tissue sample right next to it. And the

reason that we potentially advocate for two separate sites is that it kind of allows a clinician to potentially put the best sample for direct immunofluorescence. As background, direct immunofluorescence can be a very costly laboratory test that can cost upwards from $600 to $1,500 depending on which laboratory it's sent to. So these are very technique sensitive as far as in the laboratory, but technique sensitive as well as the clinician. Imagine this person has a blistering disease condition where their skin is potentially falling apart. It's very, very fragile. It's almost like wet tissue paper. So dentists, they need to be very, very careful as far as how they're taking these samples or dermatologists. We recommend that they take it from the anterior portions of the mouth. The buccal mucosa on the inside of our cheeks is a little bit easier. It's more analogous to our skin because it's movable. Tissue samples taken from the gum tissue can be a little bit more challenging just because they're bound down to the mucoperiosteum of bone. So one sample goes to direct immunofluorescence. That's potentially more important to prove pemphigus vulgaris because we need to see where these autoantibodies are localized in tissue. One sample's taken for H&E. H&E can sometimes be incredibly important for diagnosing other clinical mimics, and so we want potentially both samples.

Dr. Mintline: As far as intraoral biopsy tips, this is probably for more of our clinicians in the audience. Perilesional biopsies from the anterior buccal mucosa are generally optimal because as ample connective tissue and they're a little bit more robust, it's more analogous to taking a skin sample. Another tip that I sometimes use in the clinic is using something called a Thompson stick. It's basically like a purple marker to kind of draw where I want to take the sample. The purple marker covers the overlying surface mucosa and it can sometimes act as a proxy to determine whether the mucosa has torn or peeled away. Basically, if I'm able to remove a small disc of tissue and that purple marker is still on the surface, it's at least a visual indication to me that this mucosa hasn't torn and it's most likely a viable specimen for the laboratory to review.

Dr. Mintline: The way that direct immunofluorescence works is that we harvest a tissue sample represented by this parallelogram. We potentially have autoantibodies that are tissue bound causing these blisters and erosions, these inverted Ys. In the laboratory, we treat these tissue samples with a label auto antibody, and then we view it under a fluorescent microscope, meaning that wherever it turns green is where these tissue bound auto antibodies are.

Dr. Mintline: So we can see where they're localized and the patterns that they're forming. And this can help us separate different diseases, whether it's pemphigus, whether it's pemphigoid. If there's no tissue bound autoantibodies, maybe this is lichen planus, could it be something rare like lupus or chronic ulcerative dermatitis? These are things that we can work with clinicians to kind of tease out in the laboratory. For

pemphigus vulgaris, remember we said that it's due to autoantibodies clipping desmoglein 3 proteins that hold our individual cells together. And so in this particular pattern, here's what it looks like underneath the microscope. You can almost imagine your skin as a brick wall. The cement that holds these individual bricks together can almost be the desmoglein 3 proteins holding them together. And so this chicken wire pattern or this brick wall type pattern is diagnostic for pemphigus vulgaris. So where it's showing green, this is deposition of these autoantibodies and this particular pattern shows me that this is pemphigus.

Dr. Mintline: If we kind of look at the other different parameters of the test, there's IgG IgG4 as well as C3. These were all positive in this particular case.

Dr. Mintline: So this particular diagnostic panel was performed by Quest at no cost. And so Carlos Nousari, he's an expert immunodermatologist, and so he was able to provide these images. Even on direct immunofluorescence, see this black crack here, that's microscopically how the blisters form above the basement membrane zones. That's another indication to him that this is pemphigus.

Dr. Mintline: In our program, after we do these tissue samples, we work with the students, we sit with them in the laboratory, we review the clinical images, we review the laboratory testing including blood work, direct immunofluorescence, as well as H&E.

Dr. Mintline: Here's what the H&E looked like from Dr. Mirfarsi's sample. Again, what do we see? We see this white crack inside the mucosa. That's microscopically a blister. And we see where this blister is located, it's above the connective tissue, so this is incredibly suggestive of pemphigus.

Dr. Mintline: So we use different parameters in order to kind of get to the final diagnosis. And this is why blood work, multiple biopsies are needed to get a most confident diagnosis. So the ELISA was supportive of pemphigus vulgaris as well as the direct immunofluorescence and the H&E. Then we also correlated it with what we saw clinically with the flaccid blisters to subtype it.

Dr. Mintline: So after this diagnosis was made, this person was then connected to our UCI Health colleagues at the immunobullous clinic. As background, pemphigus vulgaris it's a immunobullous disease, it's chronic. What's interesting is that it doesn't really have a sex predilection and occurs across all races and ethnicities. Most commonly it's seen in people in the ages of 40 to 60, but as we'll see in the next case, it can sometimes occur in very young patients, pediatric populations. At least anecdotally it seems that younger people, they typically have more severe presentations of this disease because they often have more robust immune systems. For this particular audience, I want to

stress that the majority of patients have oral lesions prior to skin lesions, and oftentimes these oral lesions are very difficult to treat and they're the last ones to resolve.

Dr. Mintline: As far as the management of pemphigus, therapies are based on reducing the number of circulating autoantibodies that are causing these blisters and erosions. This could include high dose corticosteroids, IVIg, monoclonal antibodies, cytotoxic agents, but that is something that you can work with expert dermatologists, rheumatologists or for people in very rural settings, sometimes people even work with hemato-oncologists to make sure that they get rituximab. What was interesting before the 1960s and the advent of corticosteroid treatments for people living with pemphigus, about 75% of patients died within one year. And so these are very serious, obviously skin diseases and the quicker that you can get treatment, the better outcomes that you'll get and the greater likelihood that these diseases can be put into remission and theoretically cured.

Dr. Mintline: As far as how these cases are worked up through our program, we connect patients with expert dermatologists that have a lot of expertise treating pemphigus and pemphigoid. We send them to the UCI Health Immunobullous Clinic led by Dr. Sergei Grando. And then again, once they have a diagnosis, we connect them to IPPF so that they can have educational resources as well as patient support resources.

Dr. Mintline: One thing I want to kind of talk about to the audience is if you have a preliminary diagnosis or if you're still kind of in the workup, one thing to consider is from the Journal of the American Academy of Dermatology, this was a Delphi survey where it's now the consensus recommendation among experts that IV Rituximab, anti-CD20 therapy and corticosteroids should be used as first line therapy for moderate to severe pemphigus. What does that mean? CD20 is a marker that we find on B cells before they mature into plasma cells and produce auto antibodies. This particular therapy is targeted at reducing the number of cells that produce these autoantibodies, and now this is considered standard therapy for these cases. So to tie this back into the diagnostic workup, rituximab can be very, very costly and sometimes insurance companies are very reluctant to cover this particular treatment unless you have direct immunofluorescent results, indirect immunofluorescent results or ELISA results. Basically the laboratory workup to prove that this is an auto-antibody driven process.

Dr. Mintline: So here's a nice picture of Dr. Grando and the dermatology team treating the same patient. So this kind of goes full circle for a higher level of treatment and management.

Dr. Mintline: After patients are worked up with Dr. Grando and they see patient educators and as well as meet with IPPF, we also ask patients to sign into the International Pemphigus and Pemphigoid Natural History Study. We want to continue to

track these patients to collect more information to kind of get how these patients are potentially worked up, and we want to make sure that this program is effective.

Dr. Mintline: So that was a case where we kind of introduced all the different ways to potentially diagnose pemphigus. More classically, pemphigus is probably just diagnosed through serology and oftentimes it's diagnosed with dermatology. But here's a case that was diagnosed through our program at Western Health Dental Center where in this particular case, this was an autistic male, 15-year-old. He was nonverbal, so it was unlikely that I would be able to do a biopsy unless we did sedation.

Dr. Mintline: And so in this particular case, we worked with his mom as well as the medical team in order to do an IV and a blood draw. In this particular patient, I would say the clinical symptoms were less clear than the first case. We did have desquamative gingivitis and ulcerations. As we evaluated his torso, he also had ulcerations and blisters on the skin, so we were kind of moving away from say, oral lichen planus and more moving into immunobullous diseases. So we thought that we could potentially diagnose this case through serology.

Dr. Mintline: In this particular case, again, the ELISA test results were very elevated, and again, we were able to confidently diagnose and prove that this is an auto-antibody driven process through just blood work alone.

Dr. Mintline: So moving on beyond pemphigus vulgaris and probably into another category, we're going to talk about sub epithelial blistering diseases, most commonly mucous membrane pemphigoid. And oftentimes I get on the phone and I talk to clinicians or specialists and they say, is H&E enough? And the answer is probably not. Even though, when we look underneath the microscope, we have a strong suspicion that it can be pemphigoid. We really hope that we get blood work as well as direct immunofluorescence to prove that this is an auto-antibody driven process. So in this particular case, it kind of dovetails with the second because what do we see? We see the redness, we see these erosions and ulcerations of the gingiva.

Dr. Mintline: So the next question, are clinical H&E and DIF findings enough to diagnose pemphigoid? Typically, yes, but in some cases we also elect to get blood work, whether it's indirect immunofluorescence or ELISA to rule out other rare subepithelial blistering diseases.

Dr. Mintline: Pemphigoid, I would like to describe it as a family of different diseases and oftentimes they can mimic other subepithelial blistering diseases. And so the laboratory, the clinicians we work together to kind of tease out these diagnoses. Epidermal bullosa acquisita affects type VII collagen. Laminin 332 is a subcategory of mucous membrane pemphigoid that can be associated with underlying malignancies. Bullous pemphigoid,

which is predominantly a skin disease. It's the most common autoimmune blistering disease of the skin, that particularly affects BP 230 as well as BP 180, and then mucous membrane pemphigoid can affect different components including α6 β4 integrin proteins. The bottom line is that oftentimes these diseases can be very subtle and sometimes we need multiple modalities to get to a final answer.

Dr. Mintline: Through the blood work, we can potentially diagnose bullous pemphigoid pretty readily because most cases are diagnosable through IgG BP180 as well as 230. We can also detect type VII collagen and epiderma bullosal acquisita. But as for detecting some of these rare subtypes of mucous membrane pemphigoid, such as laminin 332, there's only a few reference laboratories in the United States that do that, most just do that through research. So we often rely on indirect immunofluorescence to diagnose anti-Laminin 332.

Dr. Mintline: As far as what we're looking for underneath the microscope, in indirect immunofluorescence we're looking at specific patterns. Again, these are some of the laboratory mimics that we're trying to figure out. Could this be a bullous lupus case? Could this be epidermal bullosa acquisita? Could it be a subcategory of pemphigoid? As far as for clinicians as well as patients, this really kind of shows you the value of getting blood work for some of these pemphigoid cases.

Dr. Mintline: So here's a classic case of mucous membrane pemphigoid that also had skin involvement. This was a 70-year-old white male that came to our university with a caregiver. They had a several month duration of oral blisters and ulcerations, a common clinical history. Then they also had a prior history of stroke as well as a non-Hodgkin's lymphoma.

Dr. Mintline: So in the oral cavity, they had extensive erosions and right behind the maxillary incisors, and if we kind of look onto the palate, we can even potentially visualize a small blister forming in the midline as well as erosions forming on the soft palate and oral pharynx.

Dr. Mintline: They had a blister that was forming on the forehead.

Dr. Mintline: So we did serology first. In this particular serology for desmoglein 1 and desmo 3 autoantibodies, so it wasn't pemphigus. As far as BP 180 and BP 230, we are not really thinking it's bullous pemphigoid. We also did type VII collagen autoantibodies throughout EVA, and so we had negative serology. And so sometimes this is a stumbling block for dermatologists because now you have to potentially do either a skin biopsy or an intraoral biopsy. The take home message is that the majority of our mucous membrane pemphigoid diagnoses have negative serology.

Dr. Mintline: So at this point we're thinking, could this be mucous membrane pemphigoid? Could this be just a weird bullous pemphigoid case that somehow has negative autoantibodies? Could this even represent anti-laminin 332 pemphigoid?

Dr. Mintline: As far as the main differences between mucous membrane pemphigus and bullous pemphigoid, mucus membrane pemphigoid is more protracted and progressive and predominantly affects our oral cavity as well as our ocular mucosa. Bullous pemphigoid predominantly affects our skin. It's sometimes seen in older individuals. It has remission and relapsing conditions. The main takeaway point for laboratory professionals is bullous pemphigoid is classically diagnosed through serology, whereas mucous membrane pemphigoid is often negative.

Dr. Mintline: So in this particular case, we took two samples and because I guess I'm a teacher at Biopsy Save Lives and at the university I kind of was trying to break my own rules. Typically you don't want to biopsy the blister itself because it will break, but I guess I felt pretty bold that day. And then what you can do is more commonly what you should do is take a sample right near the redness and ulceration to make sure that you get a piece still intact. So even though I did this in reality, if I was to probably teach this to clinicians, you want to take a sample not on the blister itself, but again near the redness and erosions and ulcerations.

Dr. Mintline: So what did the H&E show us? The H&E showed that the entire epithelium was being lifted off almost like a fruit by the foot or a carpet being torn from the floor. The mucosa is coming off in strips, and this particular blister formation pattern is quite suggestive of pemphigoid.

Dr. Mintline: As far as the direct immunofluorescence, we saw linear deposition of IgG, meaning that this bright green pattern is forming right at the interface of the connective tissue and the mucosa. And this particular pattern again is supportive of mucous membrane pemphigoid.

Dr. Mintline: Mucous membrane pemphigoid, it's a family of different subepithelial diseases as far as different proteins being attacked, we have autoantibodies kind of breaking down some of these laminins and different proteins. The complementary system and inflammatory cells also play a role in the blister formation. And as far as patient demographics, we classically see it in older individuals and it's much more common in females.

Dr. Mintline: As far as in the dental world, if this was to be worked up in a dental setting, mucous membrane pemphigoid is at least twice as common as pemphigus vulgaris, maybe even more so in oral medicine clinics. And as far as another take home message about mucous membrane pemphigoid is we want to ask questions as far as

are there other sites being involved, whether it's the genitals, the eyes, potentially the oral pharynx or even the sinonasal tract.

Dr. Mintline: So here's a nice composite image of mucous membrane pemphigoid cases. If we're lucky, we're able to see fluid-filled blisters like on the upper left, but oftentimes these blisters are very fragile and they can pop. And so what happens is once they start to break down before they pop, they can sometimes be filled with blood, the image on the upper right. Or sometimes they've already popped and there's these small little round or ovoid ulceration. Sometimes they can even mimic a herpes outbreak. But what we should do to kind of delineate these two is look at pemphigoid would largely have larger blisters that have broke open, it'd be symmetrical, it would have a positive nikolsky sign, so it would be a very rare case to kind of confuse it with a herpes simplex outbreak. Classically, this is how mucous membrane pemphigoid probably most commonly presents, is the lower right where we see bloody gums, peeling areas, ulcerations. And so this can really mimic pemphigus vulgaris, it can mimic chronic ulcerative stomatitis and most commonly erosive lichen planus.

Dr. Mintline: About one in four cases, potentially a little bit less can have ocular involvement. So where you can potentially have disease affecting the inner eyelids. Over time, this can lead to adhesions called symblepharon to the eye. And if the disease isn't diagnosed quickly enough or if the disease lasts long enough, it can potentially lead to blindness. And so this is kind of another reason to kind of work to get a final diagnosis to prove that this is an auto-antibody driven process so you can get the life-saving therapy that you need.

Dr. Mintline: The other thing that we kind of evaluating when we're working these cases up clinically, as cases can potentially be mild in mucus membrane pemphigoid or moderate, but if they start to eventually spread to the oral pharynx where you have voice changes, if you potentially have a bloody nose, this is what escalates the case into potentially being needed to be treated by ENT and dermatologists. These are signs where the disease is not being well controlled and it needs higher level treatment and management.

Dr. Mintline: So again, patients need to see a physician if you start to feel pain or burning related to your eyes, throat, nose, or genitals.

Dr. Mintline: As far as the management and treatment of mucous membrane pemphigoid and pemphigus vulgaris, oftentimes we refer these patients to a specialist, whether it's a dermatologist, rheumatologist, oral medicine specialist, the like. For mucous membrane pemphigoid, we always ask that an ophthalmologist review the eyes. If it's not just localized just to the gums and it's starting to involve the skin or potentially the oral pharynx, it requires a more aggressive systemic immunosuppressive

therapy. So this could include a combination of rituximab, corticosteroids, IVIg or a whole host of other medicines.

Dr. Mintline: For the final part of my presentation, I'll just talk about some of the oral care tips for mucous membrane pemphigoid as well as pemphigus vulgaris. We're borrowing a lot of the techniques that we use in oral mucositis to treat head and neck radiation patients. Some of these may be kind of more common sense things, but the first thing that we advocate is using a soft toothbrush. For folks in the dental chair, we often ask them to demonstrate it. We want to make sure that they're not brushing their gums, that the toothbrush head is just on their teeth. For some people where we suspect that they might be brushing too hard we will advocate that they use an electric toothbrush so that they can just hold the toothbrush next to the teeth. During flare-ups, we want patients to avoid crunchy or hard foods or foods that are irritating. And then as far as other things, we want to make sure that if they're using topical therapies, whether it's through trays or through gauze, that they first clean the mucosa, maybe rinse with water, dry it, and then place the topical gels. I say topical gels just because gels in general have a better absorption than say creams. And then finally, we will look at what delivery trays look like and how they may help your particular cases of mucous membrane pemphigoid or pemphigus vulgaris.

Dr. Mintline: For mild oral involvement, we typically give topical steroids, whether it's lidex gel or clobetasol. I think in general, more dermatologists give clobetasol. So sometimes patients may receive some barriers because the packaging on these particular gels say not for internal use, for external use only. And so if that happens, what we typically do is we call the pharmacy, whether it's CVS, Walgreens and just like, no, this is something that we do want. So for the patients in the audience, it is safe to use and it's been used for decades. The other thing that I want to stress is that a thin amount goes a long way. What you want to do is make sure that the mucosa is dry and clean and just apply a thin film. We don't necessarily need to use a whole tube within a couple of weeks, so just a very thin amount goes a long way.

Dr. Mintline: Here's what medication delivery trays can look like. So this person had kind of this persistent lesion of pemphigus vulgaris kind of around this particular crown. What we did was we made a tray that basically covered the mucosa or sore. So the idea is oftentimes topical gels will wash away with saliva. What the tray does is just holds it next to the tissue, so it allows it to work a little bit longer. For folks that can't necessarily afford trays or find a provider that can make them trays, what you can do instead is use gauze as basically an intraoral bandage to hold that topical gel against the sores. And so that works as well.

Dr. Mintline: Whenever we have these trays, patient education is always key. Again, a thin amount goes a long way. You don't need to just pour in a huge ribbon of it inside the tray because oftentimes it'll just kind of ooze out and it could potentially just be very costly as far as wasting some of the topical therapy.

Dr. Mintline: Dentists can also sometimes use intraoral injections. Sometimes for persistent sores or particularly sores in the buccal mucosa, what we can do is we can inject lesional steroids into the sites, and so sometimes that can facilitate healing as well.

Dr. Mintline: The other things that dentists can do is for cases that may have nonspecific findings or it might be a relapse. In this particular case, this was a patient that had pemphigus that was put into remission, but then had a flare up. So the idea was, is this immune scar? Is this potentially a lichenoid reaction? Is this trauma or is this actually pemphigus coming back? In this particular case, they had non-specific immunofluorescence, but then when we did the tissue sample confirmed that this was actually pemphigus vulgaris. So that's maybe a nice clinical pearl for some of our clinicians is that direct immunofluorescence is still very important in diagnosing treated cases of pemphigus vulgaris.

Dr. Mintline: The other thing to consider for patients is that oftentimes oral hygiene can be very, very challenging when you're living with pemphigus and pemphigoid because your mucosa is very, very tender. You may not necessarily want to brush your teeth because it can be so painful. Oftentimes, oral hygiene though, particularly if it's right near the gum line, can lead to gingivitis or lead to low grade inflammation that can just exacerbate or make things worse. So we do strongly recommend that you use soft toothbrushes, you use toothpaste that is pretty gentle and that you maintain good oral hygiene, whether it's through working with a general dentist or working with a good hygienist, we want to make sure that you're taken care of.

Dr. Mintline: Here's a couple of cases where oral hygiene had been very, very challenging for this particular person living with mucus membrane pemphigoid. And so in this particular case, what we recommended was this area be hand scaled, allow it to heal up a little bit, and then from there, once the disease was controlled, they were then going to work with a periodontist to place a graft in that area where the gum tissue was missing. So we do recognize that it's a vicious cycle maintaining oral hygiene just because the mucosa is so tender and prone to injury.

Dr. Mintline: One thing, at least from the laboratory that I want to speak about is that when you're getting some of these cleanings, particularly if you have active sores, blisters, erosions, the like, I would really advocate for people to consider skipping the polishing portion of that exam. I know polishing your teeth feels amazing, they feel slick,

they feel super clean, but what we're nervous about underneath the microscope is that some of these sand particles from the prophy paste can become embedded inside the gingiva. And then from there it's very, very hard to tease out whether this is truly a flareup of pemphigus or pemphigoid or is this just due to low grade inflammation due to foreign bodies being embedded in there. So when we work with some of our patients across the street, we work with hygiene to make sure that they don't use prophy paste and that it's just hand scaling. So we want to treat these teeth as atraumatically as possible and to make sure that they're clean.

Dr. Mintline: As far as toothbrushes, soft bristles are essential. Electric toothbrushes can really help people that are overzealous or sometimes lack the hand dexterity to kind of move. Electric toothbrushes, they often have a timer as well.

Dr. Mintline: Then as far as when we treat patients with head/neck radiation, we often tell them to soak the bristles in hot water and that can help soften them as well.

Dr. Mintline: As far as toothpaste, I really have to thank a couple of my different colleagues for finding some of these different products. Dr. Ru from the University of Penn as well as Dr. Sarah from VCU, were able to find some of these different products that do not have sodium lauryl sulfate and tend not to have mint flavors. Sodium lauryl sulfate as a background is a detergent. It can basically lead to more erosions. It can potentially lead to greater inflammation. So if you can find products that lack this foaming agent, they tend to work a little bit better and they don't hurt as much. And then as far as avoiding mint flavors, sometimes those can be a little bit strong, so maybe kind of gear towards more of the pediatric flavors, whether it's watermelon or berry or even non-flavored products.

Dr. Mintline: The other thing that I got a couple of questions about before putting together this slide deck was, what are some common ingredients for magic mouthwash? Well, what are they and how do they work? Oftentimes, magic mouthwash is a compound where it has different ingredients. Most commonly it has some sort of Benadryl in it and it acts as a coating agent that is anti-inflammatory Oftentimes in head/neck radiation patients or even blistering disease patients, we even refrigerate it for them so it even has a cooling effect. And then another thing that we have potentially in these magic mouthwash concoctions is viscous lidocaine. So it basically kind of numbs the mucosa. What I really want to stress about viscous lidocaine and for different magic mouthwashes that have viscous lidocaine is make sure to lock it up and keep it away from children. Oftentimes children, they'll want to taste it or drink some of it. Viscous lidocaine unfortunately can induce seizures in children, so just be careful about that.

Dr. Mintline: Products to avoid, we want you to avoid mouth washes that include alcohol. It just dries and irritates the tissue. For folks that have these sores, they may be tempted to kind of treat them aggressively, avoid peroxide rinses that will just kind of further irritate the tissue and can lead to tissue necrosis and just limit or avoid alcohol and tobacco as well.

Dr. Mintline: So in conclusion, pemphigus often presents first in the oral cavity, and as far as mucous membrane pemphigoid, oftentimes dentists and oral biopsies are essential to get to the final diagnosis. The dental team can play a critical role in the diagnosis, treatment and management of these diseases. We really advocate a multi-professional approach to this. So work with your medical team, work with your dental team to get optimal care. If you're in the Southern California area, we do have a Biopsy Save Lives program that can provide free diagnostic services to hopefully accelerate diagnosis times and reduce the number of patients needed to get your final diagnosis.

Dr. Mintline: So that's all I have for you today. I really advocate that you make sure to support the International Pemphigus and Pemphigoid Foundation. They're a partner in this particular program. They've done a great job as far as advocating for patients and they've just been wonderful. Thank you.

Becky Strong: Thank you Dr. Mintline. That was a great presentation and you gave us a lot of information. We did get some great questions during your presentation. And our first question is, Sally asks, when your MMP mouth is stable, is it okay to use whitening agents on your teeth?

Dr. Mintline: I think it would be. What I would advocate is for whitening agents, I would probably lean towards doing it in the dental office if you can potentially afford it. What they can do inside the dental office is they can potentially put a rubber dam on your teeth so only your teeth are exposed. So it would also limit the number of exposures of the peroxide gel used to whiten your teeth. If you wanted to do something at home, I would just be very mindful that these whitening strips are only on your teeth.

Becky Strong: Great, thank you. Our next question is asking about if there's any natural remedies to help lessen the effects of pemphigus or pemphigoid. They mentioned manuka honey with high MGOs in their question. They're also asking if it independently can also help after a rituximab infusion?

Dr. Mintline: That is a very interesting question and I think it was even brought up in the Northern California meeting earlier. I'll have to do more research on that. I don't know specifically, but it's something that I can do a PubMed search on or even ask some other colleagues, but unfortunately, I don't know.

Becky Strong: Great, thank you. We also got a good question asking ,why is the mouth so affected? What makes it so special over other body parts?

Dr. Mintline: Yeah, I think the mouth, at least for pemphigus vulgaris has increased desmoglein 3 protein, so the autoantibodies kind of go hide out there and attack there. But our mouth is just also home to lots of incidental trauma through talking and chewing, and so we probably receive a lot of trauma that we don't necessarily realize until we have some of these diseases.

Becky Strong: Great, thank you. Joanne is asking, she said that her mouth lesions didn't come out until about a year after she was diagnosed and she asked if it's common? Her doctors thought it could be rare.

Dr. Mintline: I agree that is a rare presentation as far as having potentially skin lesions first, then the oral cavity, but there are plenty of documented cases where people don't necessarily follow trends.

Becky Strong: Great, thank you. Elliot is asking a great question too, and he's asking if you could review the anesthesia options for oral biopsies? He said he did receive nitrous for a triple biopsy while he was awake, and it seemed like it was a pretty traumatic experience.

Dr. Mintline: So most cases can be done just under local anesthesia, in some cases we may elect to do sedation or even nitrous oxide. The most important thing is we want to make sure that the area is numb. We do that with lidocaine as far as injections, we do that potentially doing injections around the area that we want to do it. We can even do a block as well, so the whole region is potentially numb. What the numbing does is it makes sure that it doesn't hurt when you do the tissue sample, but also constricts the blood vessel so there isn't a lot of bleeding. For some folks that are anxious, nitrous oxide can be very helpful or we can even sedate them. I think in the majority of our patients in the clinic, we tend to just do local anesthesia. It's something to talk with your medical or dental provider about to figure out what you're most comfortable with.

Becky Strong: Thank you. Our next question is, should one continue to see an oral disease specialist, even though I no longer have blisters or symptoms, the rituximab has been successful.

Dr. Mintline: That's kind of a personal question, but if you feel like the disease is being managed, what you could potentially do, see an oral medicine specialist and just ask if you could be put on a longer recall interval just to kind of touch base. And the other thing is you could potentially defer to whoever's giving you the rituximab, whether it's rheumatology or dermatology, to get their expert opinion as well.

Becky Strong: Great. Thank you. Laura is asking a question. She's wondering what a patient in remission with PV should do to see the dentist. Are antibiotics necessary before cleaning or other precautions and how often should they be seeing a dentist?

Dr. Mintline: As far as antibiotic prophylaxis prior to dental treatment, that probably isn't necessary unless there's other underlying conditions and that's something that you can work with your medical team and dental team to figure out. But you may want to consider a prophylactic dose of a corticosteroid if you're potentially doing a more advanced procedure. And again, that's something that you'll want to work with your medical team to figure out. In some cases, you may be able to do straightforward or shorter, simpler procedures without that, but sometimes that prophylactic corticosteroid coverage can potentially limit the likelihood of a flare up.

Becky Strong: Thank you. The next question is asking, in case there's a need for dental work, is there anything that can be applied topically to help? Is Vaseline an option? And when is it okay to have surgery?

Dr. Mintline: As far as Vaseline, it's great on the lips. We typically don't advocate for Vaseline to be used inside the oral cavity, particularly in ulcerations because what it can do is the petroleum jelly can almost act as a foreign body and sometimes it can delay healing, but it's fantastic for the lips, particularly if you're getting stretched out and people are working in different areas. As far as topical therapies, you probably want to make sure to use topical steroids and probably work to a point where your mucosa is in good shape before you even see the dentist. Does that probably address the question, Becky?

Becky Strong: I think so, yes. So thank you. Okay. Our next question, Nancy is asking is Dupixent suggested for oral lesions and she says she already does IVIg.

Dr. Mintline: It may be, does she have more details?

Becky Strong: Unfortunately, that's all that she wrote.

Dr. Mintline: Okay. I think what I'll do is, if you don't mind, Becky, what I'll do is maybe we can reach out to her separately after the meeting to see if we can have a little bit more details for that question.

Becky Strong: Yes, absolutely. We have some treatment questions about how long you can be on dapsone or doxycycline. Is there a limit to that or how many rituximab that you can take?

Dr. Mintline: As far as doxycycline, we've had patients with mucous membrane pemphigoid that have been on it for potentially years. So that's an interesting question

onto itself. It's thought to limit matrix mortality protein, ACEs, or basically enzymes that help break down the tissue inside our connective tissue. As far as rituximab, I would probably have to defer dermatology as far as some of the limits of that as well.

Becky Strong: Stu says that he's curious about the limitations of therapeutic options for the treatment of pemphigus. What do you do when the disease is refractory to rituximab?

Dr. Mintline: That's very, very challenging. In fact, there's a UC Davis clinical trial that's kind of looking into that as far as looking at other therapy options for folks where rituximab may not have been as effective. If you're potentially interested in a clinical trial, I would see if we could reach out to Becky Strong and we could give you more information on probably new advancing treatments.

Becky Strong: Great. We have a great question, and Luke is asking if rituximab is safe at 80 or is there a preferred treatment?

Dr. Mintline: I imagine this patient potentially has a moderate case of pemphigus vulgaris. It is safe at 80. Rituximab classically is also used in B-cell lymphomas and other disease models, and so older patients have taken it before.

Becky Strong: Great, thank you. This is something that you and I have talked about, and this is going to be our last question because we've taken so much of your time. Shelly is asking how to come across or find biopsies or clinics in Canada who are able to perform the direct immunofluorescence testing?

Dr. Mintline: That's a fantastic question. I think it's kind of a two part question. One, you have to probably find a clinician that's willing to do the sample itself surgically. Then two, that surgeon needs to find the laboratory to send it to. So probably depending on where you're living in Canada, whether it's a metropolitan area or very rural area, will probably have different answers. If you can swing it, I would probably see if you can go to an academic center, whether it's in Toronto, whether it's through an area that's closer to, there's a dental school in Nova Scotia as well as McGill University. If you're kind of in the Vancouver area, maybe you can kind of work in the Seattle area. But I think that the bottom line is if you give us more information and if you reach out to Becky, we can potentially find colleagues that are potentially willing to do that particular surgical biopsy, say if it's an intraoral or a skin biopsy. And then from there, it's easier to find the lab if you can find the clinician that's willing to do it.

Becky Strong: Great. Thank you. One more question for you if you don't mind, and it's kind of a curve ball, so it's okay. Do you have the number of people who have pemphigus and then separately pemphigoid in the USA?

Dr. Mintline: I do not. It's hard to even come up with the accurate number for the disease of prevalence. If we look at the IPPF Natural History Study, that was probably limited to 300, maybe 400 patients. If we were to probably look at some of these disease statistics, maybe it's 1 in a 100,000 , maybe it's 1 in 200,000 cases as far as pemphigus and pemphigoid. Becky, do you have more accurate data?

Becky Strong: Not off the top of my head. I'd have to do some digging.

Dr. Mintline: Both conditions are considered ultra rare orphan diseases, and so yeah, it is hard sometimes to find clinicians and people that have heard about it. It's really, really nice that we have a patient advocacy group that can come together and talk about these different topics as well as support one another.

Becky Strong: Absolutely. Well, Dr. Mintline, that hour flew by for me. We truly appreciate you taking the time to join us and for sharing such valuable information with our community, and a big thank you to everybody joining us as well. We want to extend our heartfelt thanks to everybody for your ongoing support. It's because of you that the IPPF can continue to provide essential resources, education like today's webinar and compassion to patients and families facing these challenging diseases. We look forward to the future. We are filled with hope for all that we can accomplish together. Our mission still remains strong, to build a united community, deliver unwavering support and education, and inspire hope for everyone affected by these diseases. No one should ever face this journey alone. Your generosity has the power to make a profound impact. When you donate to the IPPF, you're not just contributing, you're offering hope to those who need it most. Every dollar fuels vital programs, provides life-changing resources and transforms lives of those who rely on our resources. Scan the QR code or visit www.pemphigus.org to make your contribution today. Together we can continue to give hope, change lives, and create a lasting future.

Becky Strong: So great big news and we are thrilled to announce that the 2025 Patient Education Conference will be held in Atlanta, Georgia from November 7th through 9th. So get ready for an unforgettable weekend filled with expert insights, empowering education, and meaningful connections with others who truly get it. Whether you're newly diagnosed or have been living with pemphigus and pemphigoid for years, this is your chance to learn, share, and feel supported. Mark your calendars and we hope to see you there.

Becky Strong: Stay in the know by also signing up for our email list. You'll get exclusive updates on this year's patient conference, upcoming webinars, events, and the latest news in the pemphigus and pemphigoid community. It's the best way to stay connected and ensure you don't miss out on important resources and updates. Joining is quick and easy. Just scan the QR code or visit www.pemphigus.org and click on the join our email

list at the top of the page and enter your information into the pop-up box. Sign up today and be part of the conversation.

Becky Strong: Have you had a chance to explore the IPPFs resource page? If not, now's the perfect time. Whether you've just been diagnosed or seeking trusted guidance on managing and treating Pemphigus and Pemphigoid, our guide to Pemphigus and Pemphigoid is an essential resource. It's filled with medically reviewed answers, practical tips and expert insights to help you navigate your journey with confidence. We've made this guide available in multiple languages so it's accessible to as many people as possible. In addition to our guide, our patient resource page offers a wide range of educational materials to support you. We hope these resources will empower you with the knowledge you need to live more comfortably with pemphigus or pemphigoid. So I encourage you to visit the research page and explore all the information we have to offer, a healthier future starts here.

Becky Strong: Are you looking for a doctor who understands pemphigus and pemphigoid? Well, be sure to check out the IPPF Find a Doctor Directory. This easy to use tool allows you to search for doctors in your area or anywhere in the world who are experienced with these rare diseases. It's a great starting place and you can filter your search using various criteria to help you find the right doctor for you. We're also excited to announce that we'll be adding a section so you can help keep our directory up to date. You can notify us if a doctor's information has changed, and plus, we'll be adding tips and tricks to guide you in finding the doctor that's perfect for you. Scan the QR code or visit our website to get started. The Find A Doctor directory is just the first step on your journey and finding the right healthcare provider.

Becky Strong: Do you want to help doctors and researchers gain a deeper understanding of pemphigus and pemphigoid? Are you hoping for more effective FDA approved treatments? Then join the Natural History Study. Sponsored by NORD, the National Organization for Rare Disorders, and the FDA at Food and Drug Administration. This patient registry keeps your information private and secure. Your participation will help drive research forward, improve treatment options, and bring us one step closer to a cure. Share your journey and make a lasting impact on everyone affected by these diseases. Get involved by visiting www.pemphigus.iamrare.org to join or scan the QR code.

Becky Strong: Next is another opportunity to be involved in research. Researchers at Yale School of Medicine and Yale School of Public Health are seeking volunteers for a

research study examining the psychological and social consequences of having an autoimmune blistering disease. Your experience matters. This anonymous survey will help advance our knowledge of the impact of living with pemphigus and pemphigoid. You can visit the website on the screen or scan the QR code to participate in the study.

Becky Strong: The IPPF also has support groups nationwide. If you'd like to join a meeting, please visit our event page to register. We're also looking to expand our network, so if you're interested in starting a support group in your area, please contact me. Becky Strong at becky@pemphigus.org. It's a lot easier than you think and a great way to help others find the peer support they need too.

Becky Strong: Next, and lastly, we've heard your request for more discussions on research and we're excited to deliver. I'd love for you to join me in our next patient education webinar on Tuesday, June 3rd. Dr. Animesh Sinha, Professor in the Department of Dermatology at the University of Buffalo will be presenting on the fascinating topic, “Insights From You, The Value of Patient Samples and Pemphigus and Pemphigoid Research”. Dr. Sinha will highlight the critical role patients play in advancing research and what he has learned from the valuable patient sample collected at past patient conferences. This is an incredible opportunity to learn how your involvement can sincerely shape the future of pemphigus and pemphigoid research. I hope you'll scan the QR code on the screen now to register. We look forward to seeing you there. Please know a recording of today's presentation along with a survey will be sent out after the webinar, and I thank you for joining us.

Dr. Mintline: Thank you again for having me, and if there's any questions, please email Becky Strong or contact me and we'll see if we can get to the bottom of them. Thank you.

Becky Strong: Thank you.