Good afternoon. Welcome to the Harvard School of Dental Medicine's continuing professional education, CPE. Today, talk number three, titled *Approaching Endodontic Emergencies in a State of Emergency*.

My name is Dr. David Kim, and I'm the director of CPE at Harvard School of Dental Medicine. And I'm very pleased to introduce our moderator, Dr. Jennifer Gibbs. Dr. Gibbs is a director of endodontics division and a program director of Advanced Graduate Education program in endodontics at HSDM. Dr. Gibbs as we are hoping to reopen our dental offices here in Massachusetts, and in some states, many have already opened, we have been utilizing teledentistry and other treatment modes that allow us to reduce the number of actual in-person patient visits. Many of our emergency dental procedures have been due to endodontic or endodontic periodontic origins, and we want to find out how endodontists are dealing with these difficult cases. Can we also discuss about the updated guidelines on the use of antibiotics to manage pulp necrosis?

Thank you, David. Yes, Dr. Kim, we, indeed, have instituted the concept of teledentistry at our school, as we were asked to minimize direct contact with patients in this interim period during the COVID-19 pandemic.

I have also been treating the emergency patients at Harvard School of Dental Medicine who were not sufficiently managed through teledentistry. And we have noticed some benefit of using teledentistry during this time. So for example, we know we can render some immediate guidance for pain management. Also, we're able to develop some familiarity with the patient before they might come in for an in-person visit, which helps both the patient with their anxiety for coming in to the dentist, and also with our own anxiety for knowing something about the patients we're treating-- what have they been doing? Have they been isolating at home? What are their risk factors for COVID before they actually come to the dental office?

Also, as we move forward with opening up for more dental procedures, we're always assessing the balance between the urgency of the clinical need of the patients and then our ability to perform the treatment without putting ourselves at high risk for exposure to COVID. Endodontic procedures will continue to be on the front lines of this as we open up, because endodontic emergencies are extremely common and debilitating for patients. So there's a lot of urgent need there. And then we also have the benefit of using the rubber dam for all of our root canal procedures, which affords a
great amount of protection from aerosols.

So for today, I've asked two of my colleagues at HSDM to present on how they are approaching endodontic emergencies during this pandemic. And they'll demonstrate some of the protocols they're using in their own practices, and some guidelines they're using, as well, that are applicable to private practice and hospital-based settings, and university-based settings.

So it's my great privilege to introduce our two presenters today, who will be able to provide clear guidance on some of the commonly faced questions regarding endodontic emergencies in the age of COVID-19. So Dr. Jarshen Lin is a Director of Pre-Doctoral Endodontics and Director of Extramural Education at Harvard School of Dental Medicine. He is an editor of various dental textbooks and serves on the editorial board of several journals. He is in private practice at the MGH Dental Group and in the faculty practice group at Harvard School of Dental Medicine.

Dr. Brooke Blicher is a Diplomate of the American Board of Endodontology and a fellow in the American College of Dentistry. She holds faculty appointments at HSDM as well as Tufts University School of Dental Medicine, and also serves as a member of the surgical faculty at Dartmouth College. She is in private practice at Upper Valley Endodontics in White River Junction, Vermont.

Dr. Lin and Dr. Blicher, we will turn our discussion over to you now.

Thank you so much, Jennifer. And thank you, Dr. Kim, as well. So just jumping right into this. We wanted to talk about approaching endodontic emergencies in this state of emergency that we're all in right now.

So it's never a good time to have a dental emergency. But I would argue that most people, most patients, would think that now is probably the least favorable time they've experienced. The world is different, obviously, than it was just a few months ago, and dentistry has not been spared from this. It's not clear if we're going to get back to normal or when that would occur. And I think that some of what we're going to talk about today applies, probably, beyond just the next few weeks, months, and years. Some of this may be stuff that's changed forever.

So in the next few minutes, Dr. Lin and I are going to talk about diagnosis and management of endodontic emergencies, including some updated pharmacological strategies for managing odontogenic pain and infection. So just-- we'll go to the next slide. Just making sure we don't have any technical difficulties there. Perfect. So we have no conflicts of interest to disclose here. None of what we're going to present is the official opinion of Harvard School of Dental Medicine, just as a caveat.
So starting off. Dr. Ken Hargreaves talks about this 3-D approach to endodontics. We have the triad of diagnosis, definitive treatment, and drugs, none of which can exist without each and every part. So without a complete diagnosis, we can't prescribe medications and we can't recommend definitive treatment. Drugs are not always needed, and when they are, they cannot definitively manage endodontic [INAUDIBLE]. Definitive treatment with either endodontic therapy or extraction will eventually be needed.

So COVID limits our abilities to approach these 3 Ds completely. A complete diagnosis and definitive treatment can't be done if we are physically distancing from our patients and limited in our stock of PPE.

So looking at diagnosis. Phone and telehealth can aid us, but this involves some real adaptability by patients and providers, with clear limitations. Our ability to do definitive treatment further comes into question when we consider issues with aerosols, as well as legal and professional guidance that's ever-evolving on what patients we can and can't see in our practices.

Drugs, though, that's something we can do. So I think we all know what's different right now. We've sat through many webinars on this, probably, so I won't spend a ton of time on that. We've all had to sift through different data based on where we practice. But the take-home is that most of us are limited in some way, either by local legislation, PPE, or both, in bringing each and every patient into our office.

So even with restrictions in practice, we are told that we need to see life-threatening emergencies, and we need to divert patients who would otherwise seek care in the emergency room. Endodontic emergencies like a cellulitis can truly be life-threatening. And the pain of a pulpitis can drive patients to the emergency room. Other endodontic issues simply risk turning into one of those life-threatening or severely painful conditions, and it can be a real challenge for us to triage.

So let's try to do that a little bit, and start off with diagnosis. So in normal times, we need our comprehensive subjective and objective exam. We need to get a patient history, the chief complaint, the history of the present dental illness, and we do an exam. We look extra-orally and intra-orally at the soft tissues. We look at hard tissues. We do our clinical testing, and we do a radiographic exam.

So these are not normal times. And in efforts to triage who actually needs to be seen in our practices, we are encouraged to turn to telehealth. So, having never done telehealth in my years of practice
prior to March, I was skeptical. But as Jennifer alluded to, I've been kind of pleased with how amenable patients are to this form of communication, and actually, how useful it can be for me as a provider.

So I'm able to meet patients, connect with them, get a history, and do a limited exam without the interference of PPE, which can be a real interference in connecting with patients. Based on a suggestion that Dr. Chase gave during the first webinar in this series, I can have patients send me intra-oral photographs that I can incorporate into the video call. I'm able to do a good portion, actually, of my subjective and objective exam just via telehealth. I'm also able to start a conversation with my patients on what comes next, what ideal definitive treatment is going to look like-- of course, pending that clinical and radiographic exam-- and what medications we can use until we can get there.

Following the exam, even when it's via telehealth, we end up with a differential diagnosis. And that includes a pulpal and periapical diagnosis. And I'm not going to get into the details of what each and every one of these are, but we have our pulpal side of things and we have our periapical side of things. And from these, there are a few things that stand out as producers of pain, which is usually what drives our patients to call us in the first place, especially during a state of emergency.

So the other things, the chronic conditions, we can certainly assess for. But unless we're dealing with a pulpitis, unless we're dealing with necrosis and we have symptomatic apical periodontitis, or we have an acute apical abscess, it's really hard to make the argument that these are emergencies and things that would drive our patients to the emergency room. Now, there is an exception when we're dealing with major medical issues. Every case should be taken in and of itself. But for the most part, there are a certain set of diagnoses that we're looking at. So, and it is pretty amazing how telehealth can help us pick these things up.

So I wanted to go through just a handful of telehealth cases just to show the utility of what this actually can provide for you as a provider. So this patient called at my office and said she had facial swelling. We get her on the video call, and her chief complaint is, I woke up like this. She has clear submandibular swelling in that lower left quadrant. Getting a history, she says that her dentist had told her she needed a root canal six months prior. So that gives me a little clue that I can call her general dentist who has access to the records, and I can get an X-ray. Even though it's six months old, it still gives me some information.

So getting that X-ray, and looking at my patient, and talking with my patient, I can make a diagnosis.
A pretty confident one, actually, in this case, that this patient has pulp necrosis with acute apical abscess related to the deep caries that happened in the first molar historically. So, starting the conversation. Definitive treatment will be needed, eventually. And it's important to counsel my patient so she doesn't postpone things another six months.

But in order to prevent patients like this from ending up in the hospital, we need to immediately prescribe antibiotics. So this patient, even beyond antibiotics, she has a facial swelling. We need to be monitoring her. And I can closely follow up with telehealth-- I can do a video call with this patient each day to make sure her swelling comes down. We can talk more, in a couple of minutes, about what to do if the antibiotic isn't effective, and/or if things get worse. But I've done a service. I've provided some care for that patient, just with telehealth.

So, a next case. And in this one, we can use that tip from Dr. Chase to take the intra-oral photograph. And patients are likely to get a better view than they can get when they're on that video call with you directly. So, chief complaint is, I broke my tooth. It's been sensitive for a while, then I heard a crack. And actually, now it's less painful, but it's definitely broken. The pieces are moving apart from each other.

And even on a video call, I can get the patient to stick their hands in their mouth, and wiggle those teeth, and see that this tooth is split-- there is no way around it. You know, I can certainly have the conversation with the patient to say, you know, OK, we can get an X-ray, and maybe get into some theoretical heroics, here. But probably, this tooth needs to come out. And having the conversation that that's probably what needs to happen, we can skip a step. We can skip that face-to-face encounter in a time when we should be physically distancing from people. We can spare our precious PPE in our own offices and get the patient directly over to the oral surgeon, in that case.

So the next case shows us how telehealth can actually help us triage those patients that we do need to bring in. So this patient's chief complaint is, I have the worst pain I've ever had. And this patient calls up with a classical history of spontaneous radiating pain that's worsened with cold and heat. This is pathognomonic for the symptomatic irreversible pulpitis.

So we'll COVID screen these patients, of course. And in some cases, they, or we, may elect to delay treatment. We can talk them through management using pain medications. But usually, if a patient like this is in enough pain, they're going to want to come on in to the office for that complete exam and definitive treatment.

So let's go on to drugs, and I'll pass things over to Dr. Lin here.
OK, let's talk about the drug. And for endodontics, the drugs, pretty much we're talking about analgesics and antibiotics. So let's start with analgesics, which is painkillers. Ibuprofen and acetaminophen has been our top choices for analgesics. Acetaminophen actually has a quicker onset-- 30 to 60 minutes to reach its peak concentration, while ibuprofen takes about two hours, or 120 minutes.

NSAID tends to have a more effective and longer lasting than acetaminophen. However, NSAIDs still have its own ceiling effect. Why don't we consider combining these medications and take advantage of their different mechanisms-- different working sites, different peak times. Maybe we can max out its effectiveness so we can reach the maximum dose-- before we reach the maximum dosage.

And let's look at the work, actually, from [INAUDIBLE] 2004, where the combination of 200 mg ibuprofen and 1,000 milligram acetaminophen provide greater pain relief than 600 mg ibuprofen alone. The drugs together has shown to reach synergistic-- means one plus one are larger than two-- those additive effects on pain relief, presuming due to a different mechanism of action. Peripherals for NSAID, and a combination of peripheral and central for acetaminophens.

The other option-- and sometimes, we can add a long-lasting anesthetics, which is bupivicaine, or we call that Marcaine. This drug usually can provide a good hours of pulpar anesthesia. But in the recent medical studies suggest, its effects can reduce pain for several days. And perhaps, due to it's blockage of the nociceptive impulse. As you can see here in the Massaro study in 2012, the medical study showed, right after surgery you give mepivicaine, which is going to have a pain relief for 72 hours and a 45% reduction in total opioid consumption for 72 hours.

And let's talk about antibiotics now. So when we start to talk about antibiotics, that's talk about indication and contraindication. When we talk about, when do we need to give patient antibiotics, there are three new guidelines come out in the past two years. European Academy of Endontology in 2018, and AAE, October last year, and ADA, November last year.

While we're reading these guidelines, we're always checking the following for deciding factors. Is it an immunocompromised patient or immunocompetent patient? Is there any systemic sign of symptoms? Can we perform the definitive treatment on the same day? And the last one, is the infection persistent, even progressive?

Let's look at the AAE guidelines that came out last year, they talk about the indication. An indication primary focus on acute apical abscess for immunocompromised patient. For immunocompetent
patient, if we cannot provide the definitive treatment in the same visit, or there's a systemic involvement, or the infection is persistent or progressive, then we give antibiotics.

Antibiotics is not required for just pain, because antibiotics it's not analgesics. So just antibiotics alone is not good for pain without infection, which is a reversible pulpitis. It's contraindicated for necrotic pulp with or without radiolucency. For the presence of sinus tract, or for acute apical abscess in healthy patients when the same day treatment can be provided.

Then, now let's look at the ADA guideline published last fall. Actually, this article is particularly relevant now, because they break down. Basically, they break down the recommendation on whether or not we can give definitive treatment, can be done on the same day. Here, they are looking for only healthy patients in their work. But their recommendations, actually, they are incredible clear.

Patients with symptomatic irreversible pulpitis don't have infection, so never require any antibiotics. Patients with a pulp necrosis where treatment can be done on the same day also don't need antibiotics. But if the treatment can not be done on the same day, then you prescribe-- we call it delayed prescription is given to the patient. It means the patient has a written prescription or you phone in the prescription, only if the symptoms progress in the next 24 to 48 hours. Then patients start antibiotics.

For those patients with the localized acute apical abscess without signs or symptoms of systemic sinus syndrome spreading usually don't need antibiotics. But if treatment can not be done, then we should give patient antibiotics even without systemic involvement. And of course, patients with acute apical abscess with signs and symptoms spreading, with or without treatment, we should give the patient antibiotics.

So this is-- actually, this table is a very timely reference for us. We can really break down to the cases which we cannot give a definitive treatment, which are on the right side column, for your reference for that.

Then let's talk about specific drugs we are giving to the patient. From this table, we can see-- basically, you can see the improvement in the antibiotic efficiency as we start to broaden the spectrums of the drug. Penicillin has the narrowest. Actually, metronidazole, which only covers anaerobic bacteria, is narrowest. The penicillin is relatively narrow, followed by amoxicillin. Then, combination amoxicillin with metronidazole. Then clindamycin, then amoxicillin with metronizadole, all the way to augmentin.
But keep in mind though, this data by [INAUDIBLE] is from 2003. Drug resistance has changed over time, so I don't believe augmentin right now it is 100% effective, but it's still a very good reference for us.

Then let's look at the trend of the dentist writing a prescription over time. In the far left side is 1994 by AE member survey. Then [INAUDIBLE] from the middle, 2017-- three years ago-- AE member survey, and up to 2019-- last year-- ADA survey. You can see there's a reverse trend. There are more people actually adopt amoxicillin over penicillin over time.

How about the trend for the dentist to use it for the patient who is allergic to penicillin? Looking at these patients, you can see location matters. But clindamycin tends to be the greatest, the highest prescribed alternative, among all, especially among American dentists. Followed by azithromycin, Keflex, and others. But this, again, this is particularly relevant now, for this table. Because for the new guideline, they no longer recommend using clindamycin as a first choice in the penicillin allergy patient, due to the black box warning. For it is possible to create a C-diff super infection which is pseudomembrane colitis.

Since the nature of acute infection for endodontics usually goes down so fast in the first 12 to 24 hours, we really, really need to reach the therapeutic dose, therapeutic black label, as quick as possible. However, it takes about four to five times half life to reach that level, and we cannot wait. We don't have time to wait. So for all the endodontic infection prescription, loading those becomes necessary. Loading dose, we need to double our regular maintenance dose. And maintenance dose has to be high enough to reach the minimal inhibitory concentration of the antibiotics.

And this is a good summary about a recommendation of all guidelines I just mentioned. And this is actually-- I think this is the table we've been waiting for. So this gives the recommendations, the product we prescribe to the patient. In general, from 2017 European Academy of Endodontontology recommendation, all the way to ADA guideline, now we are recommending shorter course with higher dose antibiotics with very, very close monitoring recommended. And basically, we prescribe three days, , and with a follow-up immediately, and give patient continued antibiotics only two to three dates beyond the symptom improvement.

Our first line of drug is penicillin, 500 milligram four times a day, and starting for three to seven days dose. In medical compromised patient, the slightly broader spectrum amoxicillin may be the first line. 500 milligram tid, again, for three to seven days. If the infection is unresponsive to this medication in two to three days, then we choose, maybe, at metronidazole [INAUDIBLE] 500 milligram tid, extend
the course of both penicillin, amoxicillin, and metronidazole to match the same ending point of both antibiotics. Or, we just replace the penicillin amoxicillin with the augmentin, with 500, 125 tid for seven days.

For the penicillin allergy patient, they will have the option to start with cephalexin 500 milligram qid for three to seven days. But that's only for the penicillin allergy which is not considered severe. For the patient, if they're penicillin history involved anaphylaxis, angioedema, and hives, then now we recommend azithromycin, as we mentioned, over clindamycin. And you give azithromycin, giving them 500 milligrams as a loading dose and 250 milligrams four times a day for five days dose. If the infection's not responsive to this point, we can replace with clindamycin 300 milligram tid for seven days.

Thank you, Dr. Lin. So we're going to talk a little bit about definitive treatments now. So definitive treatment during these past few months-- past two months, in my practice-- has included the provision of emergency care that's probably not the final treatment plan for the tooth in a lot of cases. But as our offices move to reopen in these next few weeks, in most places, we'll return to doing definitive treatment with modifications.

So these days, we have to think about patient screening-- the COVID screening questions-- asking about symptoms, travel, exposures. We're getting temperature checks on everybody coming into the office. We're doing the engineering controls-- the rubber dam, the four-handed dentistry, the high volume suction. And we're wearing our PPE.

Now we can't forget, when we're bringing patients into our offices, that we still have to do a comprehensive exam with pulp sensitivity testing, with a radiographic exam to make the definitive diagnosis, knowing that this might change from what we suspected based on our telehealth encounter. We still want to avoid aerosol-creating procedures where we can. And obviously, we always want to avoid unnecessary care and the wrong treatment.

So as an example of the importance of this full comprehensive exam, patients that have lost their temporary crowns and walked around without it on for a few days might have pretty severe sensitivity and pain. And if we do a complete diagnosis with all of our testing, we might find out that this is really just a reversible pulpitis, and we suspect that just putting the temporary crown back on there will resolve the symptoms. We obviously want to give the patients a warning, this might not work. But if we think it will, that's what we should be doing as treatment for these patients.

Now currently in Massachusetts and Vermont, where Dr. Lin and I practice, we are still limited to
providing true emergency care. So that includes dental trauma, it includes severe pain— which I've adopted as a pain scale of 7 out of 10 or greater, which is the standard recommended at the University of Texas. And we're also told that we need to manage facial swellings that are non-responsive to antibiotics. So we'll talk a little bit about these things.

So first, looking at dental trauma. Dental trauma is something that can certainly drive patients to the emergency room, and it's something that we should be managing because prompt treatment really matters for long-term outcomes. This is particularly true for things like root fractures, luxation type injuries, and evulsions, where repositioning should occur as soon as humanly possible. Other injuries can be delayed up to a few days, but certainly not the weeks or months that we're being told to delay elective care in a lot of places.

The take-home with trauma— and I won't spend any more time on this— is that all management of dental trauma should follow the AE trauma guidelines found on AE's website. This is a cookbook approach. It's a free resource that's available all the time. And even not during a pandemic, this is what we use in managing traumatic injury.

So, just briefly talking about incision and drainage, because this is something that's really relevant in the management of dental infection. Incision and drainages are an important thing that we need to keep in our endodontic emergency toolbox to manage, really, the localized fluctuate swelling. It is shown to markedly reduce pain and associated analgesic use.

The idea behind it is that we're creating a pathway for drainage, but we're also improving blood flow to the site of infection. The strategy for doing this is to anesthetize the patient as we normally do, and then take a sterile scalpel and just stab the area all the way to the level of the periosteum. The area will drain. Hopefully, some purulence will come out, and we just pack some gauze into the area to stop bleeding before we send the patient home. I usually suggest to my patients that they use warm salt water rinsing for the post-operative period of a day or two, just to continue to promote drainage in the area.

So I'll pass things back to Dr. Lin, just to kind of talk a little bit more about these definitive treatments. Let me summarize the definitive treatments. I'd like to present in two flow charts for the management. For the patient with severe pain due to pulpitis, we start this day with telehealth encounters. Assuming we suspect patient has symptomatic irreversible pulpitis and patient's COVID screening shown negative, then we'll bring the patient to the office.
In the office, we should consider definitive treatment to relieve the patient's pain. The current guideline from ADA from CDC do tell us to do minimal, which is pulpotomy and pukpectomy procedures. Pukpotomy can result in more immediate pain relief. In some studies, actually, that can even be a definitive treatment with the use of bioceramics.

But in lieu of completing a pulpectomy, I'll argue that, might as well complete the single-visit root canal. Place a strong core restoration like a core buildup, and making sure this uncrowned tooth is off the occlusion.

Here's my concern. The crisis of COVID may not end soon. If we do too little definitive treatments, still need to do again. And eventually, infection returns, or symptoms recur, and infection is getting worse in the interim. And we are wasting our precious PPE, and we end up have to start aerosol again. If we already started [INAUDIBLE] on the patient in creating aerosol, full treatment and abduration maybe can prevent patients from having to return, and limit their exposure, and our exposure, and also preserve our PPE.

Now let's turn to the infection cases. We start with telehealth. If the infection is suspected, we'd prescribe antibiotics with plans to delay the definitive treatments. If there's no improvement and we prescribe, we may give a different kind of antibiotics within 48 to 72 hours. We can change the prescription, as I mentioned earlier. If there is no improvement on the second medication, patient maybe have to bring in to the office. Again, pending on the COVID screening. At this point, we should consider incision or drainage. And if there is swelling, a pulpectomy for the patient.

Today, reboot and reopen has replaced quarantine and lock down in our daily lexicon. In several weeks, we will crawl our way back to normal, to a new normal. When we get there, much will be familiar, by much will not, and there is no way back. The steps ahead will take time, and uncertainty definitely abounds.

But talking about opening up, definitely is more enjoyable than shutdown. The greatest challenging of reopening is restoration of the confidence and the trust. The same challenges we faced before, when we're dealing with early stage HIV outbreak. For us, that means our staff, our patients, must feel safe when they're entering, working in, and being cared for in our facility.

Today, we-- all of us-- are taking first steps together. This is not the end. This is just the end of the very, very bright beginning. Thank you very much for joining us today. And I'm looking forward to seeing every one of you in person very soon. Thank you very much.
OK. Thank you both for that really wonderful and informative webinar. It was really excellent. We have a little bit of time for a few questions. I had a couple of questions ahead of time that I had come up with. It is really challenging seeing these emergency cases. I think we want them to be fast, in and out, and they're taking longer than they used to. There is a lot of problems with the patients that are delaying coming in.

I was wondering if you could share some of the— if you've seen the impact of the delay of treatment on your own practice. So, are you seeing worse infections and harder emergencies to treat?

I'd say yes, for sure. I think, now, going on two months being essentially closed to all but the most severe emergencies, I have cases that I started in February that were very infected, and I was planning on finishing up just right before mid-March, when we were essentially shut down in the state of Vermont. And I'm getting calls from those patients now, that symptoms are starting to come back. I'm needing to prescribe antibiotics. You know, the next step is I'm going to be doing re-medications on a lot of these patients.

And I have real concerns about that in the long-term, because these are the people that I'd gotten to in February. There are plenty of patients that we haven't started cases on, that we've been buying time with antibiotics. We're going to be dealing with complications from that. I heard of a patient of mine last week who developed thrush because she was on her second course of plantomycin. And you know, she doesn't want to come in. We don't really want to bring her in if we don't have to. We're told we shouldn't if antibiotics are effective, but we're dealing with systemic complications.

You know, I have real concerns that in the very long-term-- you know, we know that the prognosis for endodontics is poorer when there's apical pathology present radiographically. And I think that we're going to be seeing poorer outcomes in the long-term besides just worsening infections in the short-term.

I've had several patients who appear to be having irreversible pulpitis and they're choosing to manage their symptoms with long-term ibuprofen rather than coming in, maybe even for several months. What risks should we be communicating to patients regarding the long-term use of ibuprofen and acetaminophen?

For analgesics-- yes, because the COVID-19 outbreak actually forces us, or forces the patient, to use the analgesic for a longer time than they ever wanted to. Ibuprofen-- let's just start with acetaminophen. And as from recent warning from FDA, I think we all were reminded about the liver toxicity of acetaminophen. So we have to be mindful of the dose of acetaminophen, especially if a
patient has a history of liver issue for that. I think we are very aware of that.

Ibuprofen is also taken as a very relative safe medication. For the long-term use, I will remind everybody of two things. One is, for the patient taking baby aspirin just to protect their cardiovascular health-- taking 81 milligram baby aspirin-- for those patients, they may have to be a little bit cautious about using ibuprofen. Because both medication may compete. For the Cox 1 receptor, and may make your baby aspirin lose its protection for the patient.

So actually, the FDA, in 2006-- September of 2006-- they came out with a guideline about, for the patient taking baby aspirin, you should take baby aspirin two hours before ibuprofen, and that's the best way. At least 30 minutes-- at least 30 minutes. Ideally, it's two hours before you take ibuprofen. In case you accidentally take ibuprofen first, then you wait eight hours after you take ibuprofen and take your daily aspirin eight hours after ibuprofen.

So in short, it's baby aspirin first. From 30 minutes to two hours later, you can take ibuprofen. Or the other way around. If you start with ibuprofen first, then it ends up, you may have to wait eight hours to get your baby aspirin to work.

The other thing is, come out pretty new in 2007-- Bailey's study in British Medical Journal, from that study, talking about ibuprofen. If you had been taking ibuprofen, even for the lower dose-- we talk about 1,200 milligrams a day in the past month, for patient have a myocardial infarction, the incidence increased 30%. So this is something we just have to be mindful, and that this is newer research I'd like to share with you about the possible. Even patients, in the past months, take any ibuprofen over 1,200 milligrams in the past month, and you just be careful about cardiovascular risk. They should understand that.

Thank you, Dr. Lin. So we have a few minutes left, and we did get some really good questions. I know we probably won't have time for all of them, but I'd like to ask if you have any differences in your workflow for patients who are at higher risk for having been exposed to COVID-19. We had one question of just, an actual patient who was positive. And I know from my own patient flow at the school, we treat a lot of physicians who are working in the front line, treating sick patients with COVID.

And also, it's becoming more prevalent where someone might not actually be sick, but they might have someone in their household who was sick recently. So how are you managing that history of risk to exposure to COVID in your practices?
I think-- I mean, this is kind of a pretty loaded question. And you know, I hate to make it-- you know, it is kind of a personal decision in some cases, because the guidance kind of does waver, depending on where you live. And I think we did also-- I saw the question, what do you do with a COVID positive patient? How do you treat those?

And I think that's an easy one to answer. Those patients need to be seen in a negative pressure space, which I don't have in my practice. Doesn't necessarily exist, as far as I know, in northern New England. But I think those are going to be built soon, from rumors I hear, maybe at Mass General, you know, maybe at other places. So that's an easy answer. COVID positive patients, I wouldn't be treating in my office.

High risk patients. I mean, that's the reason we have these screening questions, that we're looking for whether patients are high risk. You know, you get the question, what do you do about somebody who's a critical care doc? And yes, they haven't tested positive, or maybe they haven't been tested, but they work in contact with COVID patients.

My feeling is, you know, if it's somebody that we can follow the quarantines on, and maybe it was just that they were exposed, and they were told that they have to quarantine, try to get through that quarantine. And in Vermont, at least, they're saying the quarantine only needs to be 12 days now, rather than 14. So at least we've cut two days off of that. In Vermont, they're also letting people test out of the quarantine at seven days. So as we get more testing, we can sort of get people out of that realm and know that we can be treating them.

As far as the high risk patients, I think it is a personal thing. And there's different levels of risk that we can determine-- low-level, medium exposures, high-level exposures. You know, in reality, with the PPE, we're treating everybody like they have COVID. So wearing an N95 mask, in theory, you know, you should be safe. But there's so little that we understand about this disease at this point, that my personal comfort level is that I'm trying to get people through the quarantine.

And thankfully, we're in a period of time where testing is going to become more prevalent. And certainly, if you were going to be treating a health care provider, in most places they probably are eligible for testing. And if the pain's bad enough, hopefully they can get tested, they can quarantine until they can come into your office, and then you could treat them knowing their status, truly. I hope that answers it without being too broad.

Thank you for that. So, I'm really sorry if we didn't get to answer any other questions, but unfortunately we're out of time. I want to thank our panelists, Dr. Lin and Dr. Blicher, for their
invaluable time and experience today. And thank you so much everyone, for joining our session today. We have a lot of challenges ahead, but we're in this together. We hope you all stay safe, and let's stay connected as we continue to navigate through this crisis.

Any final thoughts, Dr. Kim?

Yes. On behalf of the Harvard School of Dental Medicine Continuing Professional Education Committee, I would like to thank our presenters and moderator for enlightening us with valuable information as we are getting prepared to reopen our dental practices.

Next Monday, May 18th at 11:00 AM in the morning Eastern time, we will have our CP Today talk number four, entitled *Oral Medicine and Oral Pathology During the COVID-19 Pandemic- The Show Must Go On*. Presenters will be from Harvard School of Dental Medicine, Brigham Women's Hospital, and Dana Farber Cancer Institute. Please visit our school's website, www.HSDM.Harvard.edu for registration information and additional information.

For those of us who want to watch our previous CP Today talk series, you could also go to our school's website, and then able to see CP Today talk number one and number two. Once again, I'd like to thank everyone for joining us from all over the world, and especially from Massachusetts as well. And then we'll see you next week. Thank you.

Thank you.

Thank you.