Successful Static Splinting: Hand Based Splint Fabrication, Part 3

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- [Fawn] Today's topic is Successful Static Splinting, Hand Based Splint Fabrication, this is part three of a four-part series. Our presenter today is Dr. Kirsten Davin. She's a veteran occupational therapist of nearly 20 years with extensive experience in a variety of practice areas, including inpatient, acute care and intensive care units, as well as the Central Illinois Regional Burn Center. Since, initially obtaining her occupational therapy degree in 2001, followed by her OT doctoral degree in 2007, Dr. Davin has routinely worked in the acute care realm. Through her experience with clients who've experienced burn injury, she has acquired extensive knowledge in splint fabrication and application. She has fabricated hundreds of splints within her acute care career, many of which were custom fabricated, individually designed on a case-by-case basis. Her splinting experience ranges from a standard safe position and resting hand splints, to highly intricate custom fabricated splints for the hand, wrist, lower extremities, and cervical spine, incorporating all varieties of materials and splinting medium. For the last decade, she has been best known for her live national speaking tours, which today have reached over 20,000 therapists in 46 states. She has conducted thousands of educational events on the topics of seating and positioning, assistive technology, work-life balance, acute care, ICU rehabilitation, splint fabrication, orthotic application, and more. Dr. Davin is an engaging speaker who strives to make learning fun. Welcome back, Dr. Davin.

- Thank you, Fawn, I appreciate it. Hi everybody, thank you for coming. This is, as Fawn mentioned, this is part three of a four-part series that we have put together regarding static splinting. So if you are just joining us for the first time, I encourage you to take a look at part one and two, and to join us, coming up, for part four within the next week or so. So we'll get started today, and as we go through this course, please keep in mind that in addition to the webinar that you're about to participate in, and in addition to the other webinars, which you can pull up, part one and two, and then part

four, which is upcoming, keep in mind that my team and I are also able to offer live courses. And since the start of the COVID-19 pandemic, we've been offering courses in real-time via Zoom or other video conferencing platforms. So if you like what you see, but if you need more information or if you'd like to contact us to help you walk through some specific splints, we're also happy to do that as well. So something else to think about, before we really get rolling, is that there is an important delineation that we should discuss. So there's the term splinting and the term orthotics, and I mention this at the beginning of all of our webinars, because I think it's important to note. So many therapists, especially those who have been in the field for a while, myself included, refer to all methods of splinting, or orthotics fabrication, we refer to everything as splinting.

Now some therapists who are a little bit newer to the field, or those who are a little bit sort of deeply set in evidence-based practice, will refer to splints as the personally fabricated options and orthotics as more of an off-the-shelf option. And then some others still will kinda push for the orthotics reference to be used for all aspects of splinting and orthotics combined. So in an effort just to standardize the conversation as we go through today and throughout this series, I'm gonna refer to all types of splinting and orthotics as a splinting process. So don't worry about getting too bogged down in the language because I will reference it as probably a splinting throughout. As far as some of the photos that we have, get my mouse working here, there we go. I would like to give a quick thank you to Performance Health because most of our photos and images within, not only today's seminar, but within the four-part core series, are being used compliments of Performance Health. They are a company which offers an abundance of splinting and orthotic materials, including Rolyan products, and a lot of the thermoplastics that we'll talk about today and throughout this series. So when you see images, odds are they came from Performance Health, so we wanna thank them for that. All right, so for our learning outcomes, by the end of today, I'd like for you to be able to identify and be comfortable with three characteristics of

thermoplastic materials, which are applicable to hand-based splint fabrication. So since today's focus is on hand splints and hand-based fabrication, we're gonna talk about some of the characteristics that are very specific to not just hand-based splint fabrication, but to any type of splint fabrication that requires a little more intricacy with some smaller anatomy that we're gonna be working with. Now, if you work in a pediatric setting, details of hands are tedious enough sometimes on an adult patient, but if you're in a pediatric setting and you're performing splinting and orthotics with pediatric clients, that can be even more of a challenge. So as we talk about some of the thermoplastics that we're going to look at today, I will try to highlight some thermoplastics that are especially helpful if you are working with pediatric hands or with little tiny kiddo hands.

So we'll mention that as we go through today as well. I'd also like for you to be comfortable with listing the steps involved in fabrication of an MP blocking splint. We'll talk about a couple of options that you can use for that. We'll also talk about finger gutter fabrication, and a couple of different design methods that will work there as well. And then finally, I want you to be able to describe a client's clinical presentation and be able to determine the appropriateness of a hand-based splint application. So when do we need just a hand-based application and when is a forearm application okay. And I also want you to be able to determine the most effective type of orthotic to use for that, okay? So before we get into the actual fabrication of the splints, and we do have about four videos today that I'll show you, that we'll walk through the process, I want to do a quick review of the materials and some of the characteristics that are gonna be beneficial. So in hand-based fabrication, these are going to be the top four characteristics of thermoplastics that are going to be of most importance to us. So again, when you're working with hand anatomy, you're working with some tiny features. So you have some small DIP and PIP joints to work around the thumb web space and the CMC. You really have to kind of get in there with that splinting material. So I do want you to be familiar with the characteristics that you see here. So the first of

which is drapability. So drapability is the ability of a thermoplastic to drape over a surface. So think of it this way, this draping is occurring as a result of the use of gravity. So to think of a comparison, if you were to take a thermoplastic that was very drapable and a thermoplastic that was not, consider you're in a fabric store, and you take a piece of silk fabric. If you take that silk fabric and you drape it over your hand, silk is very drapable, it'll fall in between your fingers, it's very drapable as you pick it up and as you move with it. Now take that and compare it to leather. If you were to take a piece of leather and lay it on your hand, it may lay straight out on your hand, like a piece of paper, not very drapable at all.

So drapability has to do with how much that thermoplastic is going to drape over a surface just because you're laying the thermoplastic on someone's hand. So gravity will take over and pull that thermoplastic over the anatomy. Conformity is a little bit different in that conformity is the ability of the thermoplastic to really conform and take the shape of the surface. This can be with the help of the therapist. So if you have a thermoplastic and you place it on someone's hand, and you really push down over these knuckles, over these MPs, then that's gonna be a very highly conformable type of thermoplastic. Now, high conformity is going to be helpful, again, with some of this hand-based design because we really want to design a splint or an orthotic, which is going to accommodate for the individual's anatomy, and you'll see that in the videos coming up.

Now, memory can be very helpful. Memory can also be a hindrance. So with memory in thermoplastics, if I have a sheet of thermoplastic, let's say I have Aquaplast. When I heat it up, I can fabricate it, I can mold it, I can do whatever I wanna do to it. If I were to let it cool, take it off, and the splint is here in my hand, and then I drop it back into the hot water, it will return to its original shape. So memory is the ability of the thermoplastic to return to its original shape when you reheat it. Now, this can be helpful because if I maybe am a therapist who has not worked very much with

splinting, or maybe I want to go back a week later and revamp that splint a little bit, memory can be very helpful. Although, memory can sometimes be a hindrance because any time that thermoplastic is warm, it's going to try to revert back to its original shape. So if I'm in a hurry, I've got seven patients on my caseload for the afternoon, I'm trying to really knock out this splint very quickly. I go in, I fabricate maybe a circumferential ulnar gutter, you'll see what that looks like in a minute. And I'm in a hurry and it's cooling, but I'm still in a hurry, I go ahead and take it off a little bit too soon. If it's still warm, what's going to happen? It's going to try to recoil a little bit.

So if you take that splint off prematurely, especially with Aquaplast, when it's too warm, you'll find that when you maybe add your straps, mark it, do what you need to do with it, have a conversation with the client about when to wear it, so on and so forth, and you go to put it back on, it may not be the fit that it was a couple of minutes ago. So if you're working with a thermoplastic that has a very high degree of memory, make sure that it's cool, cold, before you take it off. So use your cold spray, make sure that it is completely set before you remove it, okay? And with hand-based splints, perforation is going to be important as well. So perforation is going to allow for some breathability in that thermoplastic. And for more information on perforation, I'll ask you to take a look at our, I believe it was our first course within this series where we really get into some details on perforation. But just know that with perforation, it will allow for some air flow and it will allow for some breathability of that splint, plus, it's going to make it a little bit lighter. So especially if you're in a pediatric setting and you have little hands, you wanna try to keep that splint as light as possible for them, and perforation will assist you in doing so.

So I want to preface, prior to discussing this slide, that there are several different companies which offer a wide variety of thermoplastics for us to use. So what you see here, and what you'll see over the next several slides, is just a suggestion, and just kind of a cross sampling, of some of the thermoplastics, which are out there. Now that by

no means means that I'm implying that you have to use a certain thermoplastic for a certain splint. You don't have to, you may use whatever you'd like. These are just some of the thermoplastics that tend to cater well to the splint, the type of splint fabrication that we're going to be talking about. So what you see here is Aquaplast-T. So Aquaplast-T material, it's a very firm material, when it hardens, it's very easy to work with, it's very easy to mold into a contour. So if you are looking to really build those arches for an individual's hand, or really work around that thenar eminence of the thumb, this is going to be a helpful thermoplastic to use because it provides moderate resistance, it holds that immobilization for the client, but it is a fairly comfortable thermoplastic and a fairly light thermoplastic to use as well. If you are working with pediatrics, the Aquaplast manufacturer, which is Rolyan, they also have a variety of different types of colors.

So if you're in a setting where color is important, So if you have the five-year-old girl that really wants the bright pink splint to use, the Aquaplast splinting line has a lot of different types of color options, so that may be important for your pediatric clients. And Aquaplast is also available in perforations, ranging from no perforation at all, which I'll show you here shortly, up to a 42% perforation. So what you see here is a left hand, hand-based thumb spica splint. Again, keep in mind, if you are fairly new to hand splinting and you want a material that's gonna be fairly easy to work with and fairly user-friendly, that Aquaplast is often a good answer to that. Now, another option this again, if you look here, this is the same splint, okay? So it's still a left hand, a left-sided hand-based thumb spica, so the splint is the same, I'm just gonna show you a different material, that way you get an idea of, you know, I wanna get across the idea that you're able to use multiple materials with this type of fabrication. So another option, which is out there, and actually, this is the most conforming thermoplastic that's currently offered on the market. Polyform is the most conforming thermoplastic that's out there. So if you had a question which stated, wink, wink, nudge, nudge, grab your highlighters and your pencils 'cause you have a test after this, right? If you had a

question which asked which of the following is the most conformable type of thermoplastic, your answer would be polyform. So what you see here is polyform. It's the most conforming type of thermoplastic that's currently available. And again, this too is a left hand based thumb spica, the polyform because of its conformability, is offering an enormous degree of conformity to the anatomy.

So why is it important that our splints conform to the client's anatomy? Go ahead and type in the chat bar, give me some feedback. Why do we care if our splint is very conforming? And I'll give you a hint, this may be another test question answer as well, that you may be typing into the chat bar as we speak. So why do I want a splint that's conformable? All right, I've got a couple of answers here. Right, first of all, Ricky mentioned that we want to be able to conform to the site that we're trying to immobilize because if we leave some area and that CMC joint is able to move and we're trying to prevent that from happening, our splint's not going to work too well, right? Kelly also mentioned pressure areas. That's a very good, very good inclusion, because if you have a splint that conforms very well, the better your splint matches your client's anatomy, the reduced risk, the lower the risk, of pressure issues from popping up. I see someone else had mentioned bony prominences, yes. Good fit, perfect.

So the two big takeaways there is that an intimate fit is going to give you reduced pressure risk, and it's going to achieve your goal of being able to immobilize, if immobilization is your goal, to immobilize that area in which you're trying to address. So the other thing to think about with that is you may have a client who experiences something called splint migration. So splint migration happens, you've probably all seen this. Let's say you're in the acute care setting, or you're in the ICU, and you put the splints on the client and they look great, and you think, man, I am getting so good at this splinting thing, and you're so proud, and you leave for an afternoon and you come back maybe to check on the splint before you leave for that evening, and that

splint has slid around and it's definitely not where you left it two hours ago, right? There's something called splint migration where splints will actually move around. As the patient moves in bed, the splint starts to maneuver around as well, okay? If that occurs, a good resolution for that is to try to gain a more intimate fit or try to gain increased conformity with that splint. And the reason for that is if you have a splint that really conforms to the anatomy, the risk of splint migration is going to be reduced, okay? So the more intimate the fit, the less risk of pressure, the less risk of splint migration, and more improved fit also means better skin integrity as well, okay? So let's move on to an overview of splint fabrication before we actually get into the demonstration.

I want everyone to make sure that we are on the same page as far as the splint fabrication process. So the first thing we're going to want to do is determine what type of splint we're going to use and what type of pattern we're going to use. Now, as we've talked about in previous courses, sometimes you can buy what's called splint blanks, which are pieces of thermoplastic, which have been previously cut and are ready to dip in the water and apply to the patient. Sometimes those are beneficial. Other times you may want to take a piece of paper and put the patient's hand on it and try to hammer out a custom design. Other times, if you're in a setting where you know you're going to be seeing many of the same splint from time to time, and I'll show you this on the videos coming up, but if you're gonna be seeing several of the same splint designs over and over again, I recommend you go to the local craft store and you can pick up five inch by nine inch sheets of, it's a children's craft foam, and you can get 'em in a stack about, I don't know, 50 or so sheets, and if you're going to be repetitively making an MP blocking splint, or a thumb spica, you can actually design the splint pattern on that foam cut it out, and if you get the craft foam, it's a spray down, wipe off type of material that you can use from patient to patient. So just one quick, quick tip so you don't have to reinvent the wheel in terms of design all the time, okay? We also then want to prepare our space. Now, this is something that sounds like, you know,

obviously Kirsten, we want to have a pair of scissors next to us when we go to the room to splint a patient, no kidding. But it's something that I just encourage you to take a couple of minutes and just check over the splint cart and make sure everything's there before you go. Because nine times out of 10, in my facility, anyway, you'll get to where you're going, you'll be ready to start, you'll look and something's missing. So back I go down three more floors to pick up what it is and come back. So have everything prepared, if possible, have everything sort of within reach so you can be very efficient as you knock this out.

Also make sure that you prepare the patient as well. So let them know what's going to happen. Let them know that it's going to feel warm, but it's not going to burn them, especially if you're working in the burn unit, make sure that you inform the patient because there will be oftentimes a reaction to that warmth that's occurring. You'll apply the splint, take it off, do your finishing, your edging, your trimming, your strapping, we'll talk about that a little bit later. Check for fit, make sure that you've made the necessary modifications to protect skin integrity. And then, perhaps the most important option, is you want to make sure that you educate the client on the wear schedule, how to care for the splint, and why they're wearing the splint. So why am I wearing it? How do I care for it? And when am I supposed to have it on are the three big things that you want your client to walk away knowing.

All right, so our goals of fabrication. With our anatomy, a couple of things to think about. We want to make sure that we keep our, in the case of hand splinting, which is what today's topic is, we want to make sure that we are keeping the anatomy in place. So we don't want to flatten out the arches unless, of course, the orders specify that. We want to try to maintain the anatomy, maintain the functional positions, we want to use conforming materials that will contour to the skin, give us an intimate fit, allow motion, if it's indicated, and if not, be durable enough and resistive enough to resist the motion that is going to be placed against it. We also want to consider, and we'll talk

more about this when we look at the videos, but we want to consider the distal palmar crease and proximal palmar crease, as well as the thenar eminence, and if we're going to allow motion, to make sure that our splint materials stop proximally or before some of those landmarks to allow the freedom of those digits to occur. All right, so without further ado, let's get into this a little bit. Now we've talked about the hand-based thumb spica splint in other courses, I believe it was the second course of this series, we started talking about a thumb spica splint because we actually demonstrated how to create a thumb spica, but the thumb spica that we made was a forearm based thumb spica. So it went about 2/3 of the way up the forearm and came down and encompassed that CMC joint.

Now, if you have a client who only requires that hand-based option, the fabrication is going to be the same around the CMC. You're just going to stop short of that risk crease to allow for wrist motion. Now, the splint on the right is a Rolyan thumb support splint. So the name of that splint is called a thumb support splint. Looks very much like and serves the purpose very much like a thumb spica does. If you look at the design on the right versus the left, what jumps out at you? What are the key differences that you see there? I'll give you a minute to type in the chat bar. But what are the big takeaways from the Rolyan thumb support splint on the right, and on the left, you see just a regular hand-based thumb spica, which I believe that's what it looks like, it's a polyform there. Okay, so we've got a couple people chime in in here. So amount of coverage is a big one, yes, The amount of material, the palmar coverage and perforations. The hypothenar eminence is open, yes.

Okay so the two big takeaways that we're seeing here, let me grab an arrow marker here. So the hypothenar eminence, so the fatty pad that is on the ulnar side, just proximal to the pinky, this is open on the right, as opposed to being closed off on the left. And also on the right, you can see the amount of palmar surface, which is available, which as compared to the left, is taken up by splint material. So if your goal

is to be able to immobilize that CMC joint and to stabilize that thumb, but you want to do it in the least invasive manner as possible, there's a good likelihood your client would benefit from the thumb support splint, which is here. Now, this is a perforated thermoplastic. A couple of other folks mentioned the perforations. It is a perforated option, so naturally, it's going to be a little bit lighter and it's also going to be a little bit more breathable. Another thing to think about is with the splint on the left, most of the time you do want some strapping to go right around the wrist on the dorsal side. So it would run from about here, up to about there, and there's a small strap up here that goes around the thumb. If the splint on the right, the thumb support splint, if this is molded in a fairly intimate way, so if this is molded well to the client, you shouldn't need a lot of strapping with it, it should stabilize and hold on its own. If you want to put a strap around the bottom here, you can, but depending on the client, depending on their anatomy, and depending on how they present, you may not need much, if any, strapping to go along with it.

Now, another splint that we'll take a look at, I'm gonna show you a couple of different designs of an MP blocking splint. With the MP blocking splint, oftentimes this is used to address trigger finger. If you are attempting to address trigger finger in a conservative manner, as opposed to taking a surgical option, or maybe you have a client that the trigger finger isn't really involved as of yet, we're trying to keep it that way, these splints, what you see here, and what you see here, are both designed to block the MP joint from performing flexion. So this one, it's called the Vive, it has a metal stay in there, it's kind of a nylon material, there's a wrap that goes around the top of this finger and a fabric that covers the metal stay. It very simply rests in the palm of your hand and it blocks the MP right there so no flexion can occur. You can flex at the proximal and distal IPs, but the MP is blocked. Now, if you want more of a handmade option, we'll show you how to fabricate this one in just a second. Down here on the right, you can see this looks like it may be Aquaplus, might even be easy for them for that matter. Now, when you're fabricating a splint like this, with an MP blocking splint,

do not worry about getting an entire sheet out. Odds are, if you're using an MP blocking splint, if you don't necessarily care if it's perforated or not, you'll probably find a scrap on the splint cart that's big enough to use for this. The entire splint itself is maybe three inches tall by two inches wide is really as big of a piece as you need. And you'll see that when I show you the video here in just a second. But please don't take a big huge sheet of two foot by four foot, $90 splint material, and cut a big chunk off of it for this splint, because if you look hard enough, you can probably find a scrap that will get the job done.

So Katelyn, if you don't mind, I will ask you to play the first video, from this slide. And we'll go ahead and play it and I'll kind of talk you through it here. So what you're seeing are two different design options for an MP blocking splint. So down here at the bottom is a simple T design. Up here at the top is an H design, creatively named after how they present, okay? Now again, either one of these is going to be applicable for an MP blocking. I am watching a couple of your comments come through here. Yup, you're all just kind of offering, offering a feedback on what I asked you a few minutes ago. Bruce just shared with us, I'm gonna share this one with you, this is helpful. He says one of the things that he stresses to splint fabricators, who are somewhat new to this, is to plan on the strapping strategy, that's very true, to plan on the strapping strategy on the front end before you get to the end of the splint process. Bruce, that's a very good point. So before you even start the splint, keep in mind, or at least think about, where are those straps going to go, and how is that strapping going to play out? Because that's one thing and that's true, that you'll find at the end, if you haven't done this a hundred times, you may get to the end and think, oh, I'm not sure that strap's gonna lay real well there, and then maybe have to revamp the strapping process. So add to the list of things to think about, prior to starting this, you'll want to think about what those straps are gonna look like on the back end as well.

So we have two options here, we have a T option and an H option, and as you can see, I have actually traced both of these designs. This is the child's foam sheets that I was talking about earlier, these are both cut out of foam options. I've taken both of those designs and I've cut them out of, or trace them rather, on a piece of scrap Aquaplast. And so we'll take the Aquaplast, both of these are gonna create a fairly successful MP splint, MP blocking splint. You'll see how it's going to go on here in just a moment. Okay, so this is comparable to the one that we saw on the previous slide in the bottom right-hand corner, where you have the piece that comes down into the middle of the palm and wraps around the finger. With the H design, it's also somewhat comparable, but oftentimes with the H design, if you need or if you want a design that has a little bit more stability, the H design may sometimes help with this, because as you can see here, we're blocking the MP, but we also have a little bit of an additional support distal to the MP, especially if you're blocking that pinky. That's a nice way. If you do need to implement some protective measures at the ulnar side, you can do that with that H design as well. I would go ahead and cut off the end of that because for the size of the hand that we're using, we're not gonna need all that material. So we're going to take the splinting material.

Again, in this case, it is Aquaplast. We're gonna put it in our splint pan, and with Aqua plast, the nice thing about Aquaplast is you will know exactly when it is ready to go, because it will turn from that white color, that you see there, to a clear color. And you'll see a couple of pauses as we, or page breaks I guess you would say, as we go through the video because we tried to pause and fast-forward things a little bit for sake of time in our class today. But there along the edge where I'm pointing, can you see how the coloration starts to disappear? And now you can really see the coloration disappear throughout the rest of the material. So once it goes clear, you know that it's ready. I've taken it out, I've spared you the time of watching me cut. So what you missed there, because I cut it out of our video, was I took scissors and I cut out those designs, and we're now placing them back in the water to heat up. Now one other

thing to think about is a very common question that I get. Someone will say, well I don't have the $2,000 splint pan and I work in home health, so I can't take a big split pan in my trunk with this nice, pretty high end splint cart to go do these splints because I work in home health. I might have like a pan and a stove, maybe, if the person has those supplies in their home. You do not have to have a million dollar operation to splint and to splint successfully.

So please know that everything that you've seen, that you're gonna see here today, was done, especially in the land of COVID-19, I'm not able to get into clinic to do extraneous things, other than literally treating clients. So we can't do videos in there right now, we can't go in and play with, you know, excess splint material like we were able to pre-COVID. So what you see here is a pan of water on a stove that's been heated up to around 160 degrees and it was done in home, okay? So that's a very important takeaway because I don't want you to feel like you can't do this because you don't have a lot of the high dollar supplies because you really don't need them. Are they nice? Sure, if you've got 'em, great. But if you don't, it doesn't mean that you can't be successful in doing this. So we've warmed up our T design. You can see it there. We'll take it out, we'll dry it off just to touch, let it cool just a minute. And we'll go ahead and apply it to our client. When we apply it to our client... Come on client, you'll see a hand here in a second, hopefully. There we go. When you apply it to your client, okay, again, double check, make sure it's cool enough, and a very simple design with this MP blocking splint with the T design, you're simply going to roll the top part of it, the distal part of it back just a shade, so it's a little bit more gentler on that proximal IP joint. We're gonna wrap it around the base.

Now, if you have a client who presents with a very, a finger or a hand that's prone to swelling, you may not want to do a full wraparound there. You might wanna leave that open and just create kind of a U shape around that finger and cut the back of the material off on the dorsal side to allow for swelling. But what you'll find here is I'm

double checking and making sure that we can flex at the PIP and at the DIP, and that it will in fact block that MP. What I'll also probably do is I will, you can see where the edges are at the top, where I've rolled over part of the top? I'm gonna go up and I'm gonna smash those edges in a little bit laterally on the side. You'll see me do it here in a second, to allow for some better movement of the other fingers. We wanna try to keep these hand splints as... How do I wanna say this? We want the hand splints not to be bulky. We want them to be as streamlined as possible.

So you see another clip here where the video has skipped ahead on us, and the reason for that again is because of time, but I'm just gonna back up one second on this video. So here we're molding it. You can see that it's still warm because you can see that the coloration in the material is still somewhat see-through, okay? I'm gonna spray it with cold spray, which will cool it down very quickly. And cold spray, you can order a can of that pretty easily, and there's our finished product. Now, one thing you might wanna do is take a look at these edges down here. You may want to take that and dunk it back in the heat source and just smooth those edges just a touch more. Now with this one, there's no strapping necessarily that's needed because it just fits on the finger like a ring. I'm double checking to make sure that everything that should move is able to move and that only that MP on the fourth digit right there is what's actually blocked. So this one seems like a fairly successful fit, okay? Katelyn, I will let you stop this video, and we'll go to the next video that's going to show us the H design, and the H design was the design that was cut out on that green foam that you saw there as well. So with the H design.

Okay, so this is the finished product on the right. On the left, we have the H design that I've already cut out for us, to save us a little bit of time in presentation here. So we're gonna take the H design, we'll put it back in the water, and again, this is Aquaplast still, so you'll be able to see at the edges when it starts to heat up, 'cause over here you can see where the color will start to disappear, okay? Now it's really disappearing.

There is our video cut, so now it's ready to go. So I'll take this material and I'll scoop it up and I'll dry it off, get ready for our client to use it. And again, sometimes this H design is helpful. If you have someone who, where you're working on the MP of the fifth digit, and you wanna really give it some support, or if you're a little concerned with either ulnar or lateral deviation of the client's fingers, this will give it some added support as well. So you'll take this and again, we're gonna roll back that top surface to allow for some comfort, we'll give it a wrap around and we'll apply it like so. You may want to incorporate a very small strap from this palmar surface across to the dorsal surface.

Okay again, we're checking for flexion there, and as this cools, you can see where you'll have a lot of stability along that ulnar side, which sometimes can be beneficial. I've had splint orders for this type of splint before where we've really wanted to protect this ulnar aspect because of injury. So if that's the case, you can be a little creative and incorporate that H design as well, okay? All right, thank you, Katelyn. You can stop that video there if you'd like. And we'll go back to the slides here for a second. Okay, so there are one, two, three, three different design options for your MP blocking splints that you see there. Something you may want to be mindful of is, again, as far as your quiz or your exam after this, with the MP blocking splint, you don't necessarily need to have strapping with this. It's something that could be made very easily from scraps that you'll probably find. And we want to ensure that you're going to block the MP from flexion, but that you are allowing free flexion of the distal IP and the proximal IP. So it's really just that MP that you're looking at blocking when we're looking at a trigger finger application.

Now with the finger gutter splint, a finger gutter splint is typically used to protect an injured finger. So it's primary purpose is to keep the finger immobile and to prevent it from bending. In addition, sometimes you can use a finger gutter splint to ease a finger back into motion if it's been in a flex position due to arthritis, a recent surgery or other

things. You can oftentimes work that finger back as well. Now, in terms of wear schedules for either the, let me back up here, in terms of where schedules for either the MP blocking or the finger gutter, it is going to be a little bit dependent on what it's used for. So if you're looking at an MP blocking splint for purposes of trigger finger prevention, odds are the physician is probably going to have that recommended for wearing all of the time, except for hygiene and if dressings are applicable post-surgically or something, dressing changes. But for the finger gutter splint, due to the fact that this is typically due to injury, most of the time, this will be a 24-hour wear as well.

So many times, if you've ever played high school sports, if you played high school basketball, odds are you've probably taken a basketball to the finger the wrong way at one point in your life, right? And the splint that you see there at the top, this splint is probably in many first aid kits. It's just a piece of metal with foam on top of it and a couple of straps, it's all it is. Down here at the bottom, the design is fairly similar. This is some orthoplast, maybe easy form, some sort of a thermoplastic in there, and you've got a couple straps there as well. Now traditionally, this is what we think about when we think about a finger gutter splint or a finger splint that is designed to block the proximal and distal IP joints. So if the goal is to keep the finger immobile and to prevent finger flexion, this is typically what we think of first, right? But I'm gonna show you a different variance in this design, because if you have children, or you've seen clients before who start to flex the finger if they're in this design and that finger, you can flex it. If you really wanted to flex it, you could flex it through the strap. The straps can loosen, that type of thing. So I'm gonna show you another design option that will allow you to ensure that those DIPs and PIPs are actually very well extended and are going to stay that way. So Katelyn, if you would go ahead and show that first video for this slide.

Now, the concept is the same. We're doing the same thing that we are with the finger gutter splint that you saw there, we're just going to do it in a little bit of a different fashion. So I've got my Aquaplast, I'm going to go ahead and heat it up. Now one thing I will remind you of is that I want you to be sure that if you have a client who is at risk for any type of swelling or edema, this may not be the route to go because we want to allow for some movement of that fluid. So I would not recommend a circumferential splint if you are in fact having a client who has some edema or some issues with swelling, I've got Jessica here who's sharing something for us. Jessica says she uses a dorsal blocking orthosis. So it's a 30-degree angle dorsally to allow for digit flexion after a jammed finger or a basketball taken the wrong way, rather than a volar digit gutter, it works well. That's true. Yes, you can always approach this from the other side as well. Jessica, that's a very good point. And if you're not sure what a dorsal based looks like, feel free to email me and I'll be happy to send you an image or send you a picture of what Jessica is referencing there as well.

So if you have a client who requires total PIP and DIP immobilization, but who does not have a risk for swelling, this is a good plan. So I've taken the Aquaplast, I'm just gonna put it against my client to see if roughly it looks like it's going to fit their finger. And the nice thing about Aquaplast for hand use is that it's very stretchy. So you can literally pull this apart, bring it around the hand, incorporate, do a pinch maneuver to seal up the finger on both sides, and you can make a finger splint in no longer than it takes to heat the material. So our Aquaplast is almost heated up here, and we're going to take it. I'm gonna do another cut down the middle of this because I don't need this much material. I'm gonna make a slice and I'm gonna save some of this material to use for probably another demonstration here. Okay, so we're gonna cool it off a little bit. And probably make a cut. Apparently I wanted to tell you something about this because I'm taking my time and making this cut . Okay, we're going to fast-forward here. Okay, so we're gonna make a cut. And as you can see, I now probably have a piece of material, of Aquaplast, that is maybe two inches by three inches in size, okay? It's stretchable,

I'm gonna dip it in the water just one more time just to get it nice and heated up as I prepare the finger. So it looks like we're gonna do the middle finger, the third digit on this patient. And I'll take the material, I'll put the Aquaplast at the base of the MP, on the dorsal side. I'm gonna pull it up and I'm gonna wrap it around to the opposing side.

Okay, now again, Aquaplast is very stretchy, so you can very simply apply it, stretch it, and then wrap it around the top of that digit. Now, remember we talked about conformity, and remember we talked about Aquaplast, how it's very helpful in terms of being able to really accommodate for that smaller anatomy. So I'm just gonna wrap it around like so, I'm gonna pinch it on both sides. Aquaplast will stick to itself. I'm gonna flare back the edges right there at the palm of the hand. I do a quick pinch on both sides, I'll hit it with a little bit of cold spray, so it takes shape, but so it's not completely formed. And then I'm gonna pause it right here for just a second, 'cause what I'll do, I'm not sure if I included it in this video or not, but I'm gonna take the scissors and I'm just going to cut up along here to get rid of this material. I'll go to the other side and I'm just going to cut up along there to get rid of that material. So two slices of the scissors, cut, cut, make sure you don't cut your client, and there we go. We're gonna cut on the left, we're gonna cut on the right, and that's what you'll have as a finished product.

Now it is still warm, so I can, if I want to, take it and dip it and smooth out these edges. So I can add a little bit more conformability by, again, working that against that finger. Be careful with the Aquaplast 'cause it may shrink on you just a little bit, so you have to pay attention until it's actually completed. But now we have a finger gutter splint that once this hardens, it's not going to allow for IP or for IP flexion. It's not gonna happen because of the design. So when that finger tries to flex, it's not flexing against straps, it's flexing, or would try to flex, against a thermoplastic, okay? With the Aquaplast, you can choose a very thin thickness, so it doesn't impede the function of the fingers next to it. And you're not going to need any strapping with this because you have fit it to the client specifically. As you molded it, it's going to allow for it to stay on that finger

without much difficulty. Thank you, Katelyn. You can remove that video, and go back to our PowerPoint. So a couple of other splint types that we wanna talk about, and again, that may be one that you wear, do a 24-hour wear schedule with for protection as well. Now there are a couple of other prefabricated options that we'll touch on. We have an Oval-8 splint, and with your Oval-8 splints, these splints are going to help reduce the triggering or to reduce that trigger finger presentation by limiting your finger's movements, okay?

So if you have a mallet finger presentation, a baseball finger presentation, that's when the end joint of your finger, so this DIP down here, it'll bend, but you can't straighten it out by yourself. So if you have some DIP flexion and you're not able to independently bring that DIP back up, that's when your Oval-8 splints will oftentimes come into play, either at the DIP or the PIP as well. Sometimes you can use them for boutonniere deformities, we've used that also. So these finger splints are very simple to apply, they're very cost effective, they're very easy to use, and as you can see, they're also pretty discreet. So if you have someone where cosmetics are of concern to them, you can see here, this gentleman is wearing what? One, two, three, four, five, six splints on his fingers and it's not overly aggravating to the eye. So visually it is pretty appealing, if you will, okay? So these can also be used. Sometimes we'll use these to correct lateral deviation.

So if you caught in that video a few minutes ago, with the individual that I was splinting, their fourth digit at the, I believe it was her DIP, kind of has a little bit of a lateral deviation one way or the other. Oftentimes you can use these Oval-8 splints to address lateral deviation, swan neck deformity. If you have a flexible boutonniere deformity, you can use these to address that as well. And again, if you want more information on what those diagnoses are, your mallet finger, swan neck, boutonniere deformity, those types of things, feel free, email me, I can send you more information. Because it is only an hour webinar, we don't necessarily have time to go into the

diagnoses, and then the splints, because we have a lot of splint info. But if you do need more information, let me know. I'll be happy to get that for you. So when I'm with the Oval of eight splints, something important to consider is that getting the right size of the splint, the right size application, is important to being able to effectively fit the individual. So each of these Oval of eight splints that you see can be rotated 180 degrees, if you need to. You can increase the fit size by a half size. So if you have some edema, you can rotate them and that will adjust their fitting. If you go on a Performance Health's website, under their Oval-8 splints, they have also a lot of additional information on this type of product, along with some tutorials that you can take a look at specific to these as well, okay? There's also a fitting guide, it'll tell you how to fit. And finally, we have some prefab finger splints. So with these prefab splints, these are designed to treat a variety of diagnoses, including a joint tightness or flexor tightness at the PIP joint.

So it is indicated for PIP joint limitations that are presenting with 45 degrees of flexion or less. And what this is doing is it's applying just a little bit of force. Typically, it's about an eight ounce force or less. So this is applying a little bit of force and it's applying a force to allow the flexor deformity to straighten the flexion, essentially is what we're doing. So the contoured center pad that you see here, so there's a contoured center pad, it's going to distribute pressure evenly on that PIP joint. So you have two wires coming off of it, one there and one here. And those wires, if you need to, you can bend those wires to adjust the force or to accommodate how that force is applied in case you have a client who presents with edema or a need to create a little bit of a force adjustment, okay? So the way these work to promote extension or to return to neutrality, is again, you have the contoured center pad that you see here, you have wires coming off of it, and you can adjust how that finger falls within there. So it's gonna distribute pressure evenly across the DIPs and allow for some assistance with extension at that joint. Now, remember how I mentioned the palmar creases a little bit earlier, and I also mentioned them, I think it was the first course that we talked about

hand anatomy and creases pretty significantly in. So when I mentioned the palmar creases, we noted that they are a significant landmark to be used with hand splinting and with splint fabrication. Well this is where it comes in handy to know where those creases are placed because in order to measure for the splint that we just saw, okay? So the splint you see here is a spring finger extension splint, a spring finger extension splint.

In order to measure for that splint, you're gonna take a ruler, or a tape measure, and you're going to measure, from the distal palmar crease, and you're going to measure out to the DIP crease of the finger, okay? So you want to measure from that distal palmar crease, out to the DIP. Then you're going to correlate that with the measurements that you see here at the top, okay? So if you'll notice, there are two different models to this prefab splint. So the spring finger extension splint actually has two models. The first model is a little longer and applies just a touch more pressure. Your measurement for that, again, is from the distal palmar crease to the DIP crease. If you're going with a smaller, more discrete model, that applies a little less pressure, you're gonna measure from the MP to the DIP. And again, if you go on a website to order this, they will have all of this posted for you and they'll have these instructions as to how to measure for these prefabs splints as well. Now, finally, and also in regards to prefab splints, we have a progressive option.

So the difference between the splints you've been seeing prior to this and this guy is that with this splint, you're able to make independent adjustments of that splint on your own. So this splint is a static progressive finger extension splint. So you can see that here is a hinge, and you have a distal portion and a proximal portion to the splint. You have two straps, one there, and one here, and under the splint, connecting those two bridge portions, you have a large screw with a knob at the end. So you're able to adjust via turning this screw, that you see there, you're able to turn that knob and to adjust how wide, or into how much extension, these two pieces go, because as you

turn this knob, it pushes these two pieces apart. So if you have a client who is presenting with some finger flexion contractures, or some flexion deformities, and you want to gradually slowly, with a low prolonged stretch, that's the key, a slow, prolonged stretch, if you want to try to incorporate a splint to allow for extension at that PIP joint, this is a good option. Now obviously, you're going to want to incorporate this with a client who will do two things. Number one, abide by the recommendations that you're giving them.

So some clients will think, oh, well if a little bit is good, a lot is better, right? And they'll really crank down on this, which is not what we want, we want a low prolonged stretch. So if you have someone who's going to pay attention to the directions and be compliant, this is oftentimes a very good option because you can go in, do a slight turn, and allow that DI, or that PIP rather, to extend a little bit further. You don't have to go in, completely refabricate a splint, and do it all over again. This is something that they can wear most all of the time, and what many times you'll do a quarter turn every 48 hours, just depends on the client and how they present, but you can do a very slow adjustment into that full extension.

All right, it looks like we are right about on time for wrap up. If you guys have any questions at all, my cell number is here, my email address, that's my home personal email. Feel free to email me, reach out to me. If you need more pictures, more clarification, feel free to let me know, I'm happy to help. Or as I mentioned earlier, my team of instructors is now doing a lot of online courses in light of COVID-19. So we're not able to travel currently, we're not able to have a hundred people in a room, to do all of these nice splinting demos. So if you have a facility and you want to Zoom us in a couple of times to demonstrate these or to have your therapist practice along with us, via a live class to your facility, we're happy to do that. So my phone is there, my email is there. If you need anything, feel free to give me a call, and I will hand it back over to Fawn.

- [Fawn] Thank you, Dr. Davin, for a great talk once again. I think we just have thank yous coming in. I think you answered questions as we went along, so I don't see any new questions coming in. So I appreciate your time today. I hope everyone joins us again on Continued and occupationaltherapy.com. Thanks, everyone.

- Thank you.