Kathryn: Hello everyone. My name is Kathryn Hautanen. And I'm the director of the Center for Health Experience Design here at Mad*Pow today. We have an exciting webinar for you on accessible design for better patient engagement with Marli and James.

So first before we get started, I just want to give you two slides to get you introduced. First off, let me tell you a little bit about the Center for Health experience design. So we were founded by Mad*Pow and we are a community of more than 600 professionals and also a range of organizations in the health space. Our partners include fledgling startups and global organizations. To learn more, you can go to centerhxd.com. And a little bit about Mad*Pow: if you're not familiar, so Mad*Pow is a strategic design agency and we utilize the psychology of motivation to create innovative experiences and compelling digital solutions that are good for people and good for business.

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So just a little bit about the interface that we're using here. So we're using GoToWebinar as our platform and Marli and James have a lot of content that they're trying to cover. This is a very rich topic and we are trying to – at least hopeful we'll leave time at the end for questions. So if you have any you can go to the box on the right hand side and type in your question into the question box and hit the send underneath it. If we are unable to answer your questions during the course of the webinar, we will continue the conversation on Twitter.

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So James and Marli if you want to take it from here…

Marli: Thank you so much Kathryn. As she said, I'm Marli Mesibov, I'm the VP of Content Strategy here at Mad*Pow.

James: And I'm James Christie. I'm a Director of UX Design here at Mad*Pow.

Marli: And as a Content Strategist and a UX designer, we're aware that content and design have a much higher purpose than just creating things. We are actually trying to reach goals of improving patient engagement.

I mean if people can't understand what you're saying or can't see the information that you're putting out there, then they can't get any value out of it. And when it comes down to it, this is why accessibility is so important to health care. I've heard people say, you know, well, are you so worried about accessibility in the health care space because people with disabilities use more health care? But no! No, that's not even accurate. It's because health care is so important, and (at least here in the United States) it can be so complicated that we need to make sure more

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than ever that we're paying special attention to ensure that everyone can use the applications, the websites, the various things that we're creating. And that's why we're doing this webinar. There's so much information out there about accessibility but it's surprisingly hard to follow. You might even say it's inaccessible.

For example, I saw an article titled How to Avoid an ADA Lawsuit. And the simple answer is… be ADA Compliant. But what does that even mean? What is ADA? How? How do you do that? So today we're not only going to go over what technically is accessibility and what does the law say, but also guidelines and standards. And the focus is going to be on nine specific issues that you as a content creator, as a designer, as anyone working in the health care space can do starting today. And we're going to end with our process here at Mad*Pow.

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James: Yeah, and as we're going to be going along we're going to call out some of our favorite free tools and resources that help us with our own accessibility work. I'm going to call those out using a little icon here.

But to save you some note taking we've collected a full list of all the tools and resources that were mentioning today into one handy-dandy web guide which we'll share at the end of this presentation.

Marli: So. What is accessibility? You probably have at least an idea of it since you're here. You may have heard this phrase "accessibility is the ability of a person to use, access, and interact with a product or system." The problem with a statement like that is it makes it sound like we're judging a person on their accessibility, which of course we're not. We're judging the accessibility of a website or a web application. We want to be usable by as many people as possible because we know the 19% of the population – that means one out of five people –

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is impacted by non-accessible content design and development at any given time. And I specified *any given time* because accessibility is not an either/or. There's – this is not a situation where either you have a visual impairment or you don't.

For example, if you've met me you might say, "oh I've seen Marli, I know she can she can read things very far away. She has no visual impairments." But that's not true when I wake up in the morning. I can't see more than a foot in front of me before I put my contacts in. And so accessibility is something that can be temporary for some of us. It can be permanent. It could be situational. There are of course permanent impairments like visual impairment such as blindness, and hearing impairments such as deafness, but there are also temporary versions of this such as having cataracts, or wearing – or not having your contacts in, or having an ear infection, or getting laryngitis.

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And then there are situational elements, such as when you're driving but something comes up on your phone and you need to be able to see it or type a response. Obviously, we don't want to encourage people to do that. But we also need to recognize that we live in a world where things like that happen or things that are less dangerous to your life like carrying a baby or being in a loud space. These are things that might impact how well you can hear or see something in the moment.

6:03

And what we're trying to do here is to make *sure* that people who have hearing impairments can still follow video. That people who – that people can still navigate a website whether or not they can use a mouse in that moment. And that somebody can tell

whether or not their form field is accurate whether or not they can see the color of that field.

This brings us to this idea where we can even go farther. With accessibility you might say "I can add it on at the end. I… sure it wasn't perfect accessibility, but I figured it out afterwards and so I fixed it." But we want to think about these things as *inclusive* design. Actually designing with people who have all different sorts of – ranges of abilities and disabilities. We want to think about this from the beginning. Um, we want to be truly inclusive of the full range of human diversity. So you'll hear us throw that term around a little bit as well.

And part of that is quite simply that we want to design with empathy. We want to, as one of my favorite fictional characters says, Atticus Finch, he says "you want to walk in someone else's shoes" or rather, "you never really understand a person until you consider things from his point of view, until you climb inside of his skin and walk around in it."

That's what we're trying to do today. Now. There are some tools that can help us do that. For example, James?

James: Yes, so, ahh, there's a whole range of tools which we use to give our own designers and coders empathy for people who might have one or another accessibility challenge. And one of my favorites is this free plugin for Firefox and Chrome called the NoCoffee Vision Simulator, which applies filters to your live view of the web, to simulate a range of vision conditions.

And there's tons of options in there. But some of the more common things you might be looking to do… First of all, emulating different types of color deficient vision. So around 7% of men have one or more form of color blindness, as 1% of women as well. So you can actually emulate those specific types of color blindness in the browser, which is very useful, particularly

if you're testing a site which makes great use of color for explaining information in one way or another.

More common than that, just general low acuity vision. This is something we can all look forward to as we age. You can just dial up the blur filter in the NoCoffee Simulator and get a sense of what that's like. And in this case what this is telling us is that there's a good reason that the accessibility guidelines which will be looking at shortly specify that we use large text for navigation.

In this case. The Mayo's top navigation there is a bit too small, and the smaller it is the worst affected is is by blur. Even beyond that, we can simulate even more severe forms of vision loss such as macular degeneration. I picked this one because it runs in my family, there's a good chance I might have to deal with this in my own future, and along with 200,000 other new diagnoses in the US alone. So very useful tool for simulating common vision types of ah, of issue, but of course, that's not all we're talking about when we're talking about accessibility. A lot of the time

what we're talking about in accessibility, particularly in the technology realm, is compatibility with assistive technologies.

So these are just a few of the different devices people might use instead of a mouse. Eye tracking devices, braille controllers, pressure switches. There's a, there's a technology to help people overcome all sorts of different impairments which might preclude the use of a mouse.

Now then, if your site has been properly coded by following standards and guidelines, then it should work well with any and all assistive technologies. But you can't just tell that by looking at a website. You've actually go to use it. But these technologies are not easy to pick up and learn. You know, you need to have suitable motivation.

Fortunately, there is a device that you probably already have which will let you test your site to see if it is broadly compatible with these types of assistive technology. It's the humble keyboard.

Basically, you can test for assistive technology compatibility by unplugging your mouse and then using a Chrome or other browser which works this way. Just try and navigate around a website and do common tasks entirely without a mouse. And you'll find that generally many sites are pretty keyboard friendly, right up until the point where you need them to do something that might really help you, like anything transactional. It's often in the forms or in the check out where these things break down.

In point of fact, I was doing a little bit of keyboard testing earlier and I tried out the very popular Find a Provider website ZocDoc. Five million people use this every month to find a provider. And it actually works really well, keyboard alone. You can tab around, you can you can type in people's names, you can look up details, all just by using tab, mouse keys, space, etc… right up until the point you try to make a booking.

So here I try to make an appointment for 12:50 p.m. I got this modal, and that broke the keyboard accessibility. I now had to press tab 150 times before I could click that "Okay, Continue Booking" thing. So that's an example of: generally the implementation was good, but it wasn't tested all the way through. So, that's all well and fine, you're already at a webinar about accessibility. So I think we can assume that you're probably already considering accessibility as the right thing to do.

The empathy tools there give you a broader understanding of how it works and are useful to show other people that might not really understand the issues.

But when it comes to persuading a business to do the right thing, well arguments predicated on pure ethics might not get you the buy-in that you need, or get you the priority that you want. And this is where the law comes in to help.

I'd like to spend a couple of minutes here talking about the relevant law. We're talking about US law here. So there's three main things we want to think about. although they pretty much add up to the same thing. The Americans with Disabilities Act, Section 508,

and the Affordable Care Act itself. I've got to stress, very much, that we are not lawyers. This is not legal advice. So this is just our sort of laypersons' take on these issues. But here we go, with the Americans with Disabilities Act, the ADA. This is… goes back to the '90s, early '90s. It didn't really consider the web initially. There's not language in there around digital properties and digital accessibility.

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It took some while for a precedent to be established there, and that did indeed happen. Nike was sued, Amazon was sued, Burger King, Target – there was a big lawsuit against them. The result being there is now enough precedent about ADA law as pertaining to digital, that there are now 1000 web-related lawsuits a year, and rising.

Just to give you an idea of what that looks like in the health care space, here's a case from 2014. Wellpoint you might know, big health insurer, Anthem site. People couldn't use it. They got together, they sued, and Wellpoint had to reach a settlement agreement, which was less about damages and more about agreeing to fix the problems that they had.

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Section 508 is another law, or regulation. This is really if you're doing any kind of business with federal agencies. And rather than them coming in and suing you, this is more of an RFP type thing. If you're doing business with them, you will have to fill in a form saying exactly how you meet different accessibility criteria.

If you've dealt with 508 in the past, it has been updated. 508 had its own unique accessibility considerations, which were maybe not inline with the more common industry standards. That's been fixed now. Now 508 points to the main standards. So that aligns things nicely, makes everybody's jobs a little bit easier.

And lastly, very specifically to health care providers, health care industry, health insurers: Section 1557 of the Patient Protection and Affordable Care Act, which just trips off the tongue. And that specifies that we need to be accessible, particularly if we're dealing in any kind of marketplaces at all. So, another strong reason to get these things, right from the get-go.

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So what does all this add up to? Three sets of laws which broadly might cover our activity for trying to improve the patient experience. But what are they all pointing to? What in a legal sense has accessibility? We've heard what it might mean from an individual sense, but in a legal sense, what we're talking about is: does it conform to a recognized set of guidelines and standards?

And fortunately for us, these laws tend to agree on what those guidelines and standards are. They are specifically the Web Content Accessibility Guidelines, which are published and managed by the World Wide Web Consortium, the W3C, which is the international standard-setting organization for the web as a whole.

These standards have been around since '99. They've been recently updated. One bugbear for people working in accessibility is often the standards and guidelines lag a bit behind the reality. Well, there's been a big catch up recently and the Web Content Accessibility Guideline, or WCAG

as we shorten it to, now consider – properly considers the growth and explosion of mobile use, adaptive sites, responsive sites, touch interfaces, and other alternate modalities of web use, such as voice assistants and so on. So much more helpful and up to date.

If you've been working with the older version of WCAG, don't worry. This doesn't take away anything that was in the previous WCAG 2.0., it just adds new stuff, and it's all good stuff. And when we hit – when we're talking about WCAG, you're going to hear people talking about three levels of success criteria, or just the three levels, and they are A, AA, and AAA. Basically, it is fairly self-explanatory. A is the basics: you will do this. AA is actually the expected standard. That's the legal standard that ADA lawsuits tend to point to, and that's what most people expect in terms of… a definition of an accessible website is one which meets that AA standard.

AAA is advanced, it has some specialized rules which either don't apply or are not really doable by everybody, but they're still worth looking at. There's lots in there which are just generally fairly interesting.

So, where does the WCAG? WCAG lives online at the W3C website, you can go along and look. So, comprehensive set of pages there, detailing how to meet each of these checkpoints and giving you lots of tools and advice on how to meet them.

There's a slight irony here but to my designer's eye this looks like something that was made for lawyers are developers. It's a little bit dense, shall we say, although actually this version is a huge improvement over the ones we've seen in the past. Fortunately, for folks like myself, there are lots of kindly folks who have produced alternative versions which are much more user-friendly.

I personally like WUHCAG, W-U-H-CAG for a clear and well-illustrated breakdown of the guidelines. And for a higher-level view of the guidelines, we're going to head back to Marli.

Marli: Of course, if you really just need a break down the guidelines, you can come here to us! Because that's exactly what we're going to do.

WCAG is pretty awesome, and one of the things they've done that I love is that they've broken down these types of accessibility into four layers. Those are how information is seen – how it's perceived. When I say "seen" you have to imagine that in quotations, because obviously not everyone is seeing through their eyes, but how the information is *perceived.* How it's used, that's that operability piece. Whether it can be understood, and how robust it is. Now this fourth piece, how robust it is, we're not really going to touch on because there's only one subsection under that and that's compatibility which James mentioned earlier. Specifically compatibility with assistive devices.

But there's quite a bit under how things are perceived, operable, and understandable which are parts of content work.

So you can see here that we've actually highlighted which items were *not* going to touch on because they're pretty specific to technology.

For example, as a content creator I'm not going to be dealing with keyboard accessibility much, other than possibly to remind someone else to pay attention to that. But I can pay quite a bit of attention to the text alternatives. That's something that I can focus on quite well, and we'll be dealing with that. Similarly, readability is a big piece for content creators. And for designers, there are things like making sure it's distinguishable and then there's this one item here that you'll notice we've italicized. Which… well, I'll let James explain why, because this is a bit visual design a little bit development.

James: That's right. This one's a little bit messy in that it crosses disciplines, it crosses silos, in that

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we're really talking about animation and interactivity and the negative consequences of getting it wrong. And that is something which concerns people in the design department, the technology department, the UX department, and so on.

So what we're talking about broadly in this entire presentation is reducing barriers to access. It's making sure we're not making the types of mistakes, or we're making the types of accommodations which allow the broadest number of people to access your sites and services.

But there's one guideline which kind of stands alone. And that's this Seizures and Physical Reactions guideline. And this one isn't about lowering the barriers to access. This one is about preventing physical harm. Let me explain a little more here. Basically the guidelines around WCAG – in WCAG around animation and flashing content in particular are there specifically to protect people who have any form of photosensitive epilepsy, or any other related vision conditions. And if you get this wrong, it can be very messy indeed as the London 2012

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Brand Team discovered when they rolled out their new, incredibly expensive website, which had a exciting animation in this lovely color scheme. And it immediately caused a flood of complaints and people with physical symptoms reacting to this thing, because they hadn't followed the WCAG rules. Now, we're not going to dwell on this one particularly in the rest of the presentation, because we're mostly talking about general content and design issues. But we do want to call this one out as a big weighty topic in its own right. And if you're dealing with any kind of animation, particularly anything with lots of action and flashing around, then you need to pay close attention to the WCAG rules for that.

21:17

Marli: So without further ado, here are nine things that you as a designer, as a content creator, or as someone working with vendors who take care of those things can really focus on and make a difference in.

Now, six of our nine items actually fall under this Perceivable area, and that should be no surprise because this is this is just baseline. If someone can't perceive the information that is on the screen, then they can't do anything with it. And the first one, alt-text, "Do you have alt-text for images," if there's anything that you've ever heard about accessibility, this is probably the one.

Everybody knows we gotta have alt-text. We've got to have alt-text. What is alt-text? It is - we've highlighted it here on the right-hand side.

It is something that shows up in the code, that you can type into most Content Management Systems when you're creating the content, when you're uploading the image itself. It is attached to the image, and if a screen reader is reading where the image would be, it actually reads aloud that alt-text.

So, people use alt-text in different ways though. Not all alt-text is created equal. For example, The Economist has alt-text that says things like "coin flip" for this image of coins in the sign of the Facebook logo. And "magnetic attraction". Now, you might think "well sure, that sort of describes what the image is." But think about the fact that when you look at a page like this, your eyes immediately go to the images before anything else. And similarly a screen reader can be set up to read the alt-text for the images before anything else.

So if the alt-text just says "coin flip", that's all the context that the screen reader is providing. And that's not very useful information. What would be more useful would be if the alt-text either duplicated the, something like the Facebook headline there on the side, or actually describe the image as here in this other example, this one from the Royal Institute for the Blind,

where they used their alt-text to describe the images. In some cases, where they didn't find anything useful to describe, they didn't show any alt-text at all. And they can use that either as a way of guiding somebody in their navigation – maybe that that first image, the News and Stories wasn't actually something they really felt was the most important image on the page. And so if someone was scanning, they wanted them to be attracted more by "A picture of a smiling woman surrounded by plants" and they use that description because it's compelling. Because someone might want to know more about this smiling woman surrounded by plants. And so they might pause the screen reader there and ask for the next item on the page, which would lead them to the text just below it, which would provide more information.

The other thing that alt-text is great for is charts and infographics. They have their own challenges, and this can be a big topic and its own right. For example, a simple charge could just have an alt-text - an alt-tag rather that says "this is a chart of Jaguars and Ocelots", but that doesn't scale well when you've got many different data points, and you want to show more than just Ocelots are beating Jaguars.

Maybe someone wants to see all of the data points, because this is actually a very hot league and everybody wants to know what the league points are. So one area – one way

you can set up the alt-text here would be to give a simple summary, something that a sighted user would grasp at a glance. In this case that all text might say "Jaguars, Ocelots and Ligers competed for league points."

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But the other thing you can do is make sure that the text itself can stand alone without the infographic or the chart. For example, maybe the text would go into detail about the fact that Ocelots have 38 points, and how they're beating out the Jaguars who only have 25. It can go into significant detail there. Then regardless of whether somebody can't see this because their site isn't loading quickly enough, or because they're using a screen reader, or simply because they didn't happen to glance at it, they're still able to get all of the information that you're providing.

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Our second item is a variation on this.

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James: Yeah, so multimedia. Often the chief reason we go online in the first place. Like 15% of internet traffic is for YouTube, half of all Americans listen to a podcast once a week, and there's all other kinds of audio and visual entertainment out there. Much of it is not accessible, but predictably WCAG has a lot of rules for it.

So you can ensure that your multimedia does reach as wide an audience as possible and doesn't exclude anyone, by following some of these rules. And it kind of depends on what you're starting with. If you've got pure audio you might be looking to do some text transcripts. If you've got video you might be looking at a combination of transcripts or subtitles or live signing, or various other things. And WCAG breaks it down on the basis of what you have and which audiences you really want to serve, or best serve with different types of content. So common examples we see, more common example: closed captioning. So just adding captions to a video. And captions are different from a subtitle.

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Captions will also describe the on-screen actions. So a non-sighted user can follow on not just with what is being said, but what is actually taking place. Whereas at the AAA level of compliance, you might deal with things like a live sign language interpretation of a live broadcast if you're online.

So there's a lot in there to unpack, all kind of depends on what you have and what you want to unpack. One thing I will say is that it's much, much easier to plan for text alternatives for multimedia when you're making the multimedia or when your commissioning the multimedia than it is to go back and do it after the fact. That tends to be more expensive. But the effort is definitely worth it, and not just for accessibility. As we've seen with audio, these transcripts have great extra value for folks. There's a sizable proportion of people who actually prefer to read a podcast than to listen to it. And of course it's fantastic for SEO, findability online, and so on.

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Um which takes us to number three.

Marli: Does the content work, regardless of formatting? In some ways this is along the same lines of what we've already been talking about. Making sure there's metadata so that when

something moves from a desktop screen to a phone screen, if the image isn't right in the same spot, it can still stand alone.

But there is also a bit of a development part here. Making sure that the information is prioritized, or sequenced appropriately so that the screen reader knows to read, for example, images and calls to action first. Know that they're tagged appropriately with that.

This gets really important for us in health care though, because we are also talking about diagrams for patients. Think about things like a diagram that shows a diabetes patient how to check their feet. Or that shows someone how to properly take medication. This is what, when we properly format it and make sure that it's self sufficient, this makes it a diagram rather than just an illustration of what we're talking about. And this comes into play nicely as well, n ow that we're not just… we need to think not just about the properties, the metadata for example, but also the actual words that we use.

So on the right here, I've got this this idea that came from the Content Marketing Institute where they speak a lot about adaptive content and how important it is to remember that

we're not just using desktops where you might click anymore, but also phones and tablets where you're tapping, and even voice UI, for example in the car or when you're using a hands-free software where you're going to say select. So we need to think about the language that we use as well, where instead of assuming that we're going to tell somebody to click to get to the next item. We might use a different term that helps them use it regardless of whether they're clicking, tapping or saying select.

Now as an aside, you might be thinking "what about PDFs? This is a situation where the layout is very structured. I always know exactly how the formatting is going to go. I guess I don't have to worry about that here." But that's not actually true. To be honest, we could do an entire other hour on nothing but PDFs. So much of health care is all about PDFs, and forms, and they can be made accessible.

But since we're not going to spend an entire hour and a half on PDFs, for now, I'll just tell you: refer to Microsoft, because they actually have some great standards around PDF accessibility and how to make sure that when you're creating PDFs they are accessible to people who are sighted.

James: Number four. Switching gears here to talk a bit more about visual design contrast. And this is probably the #1 issue which we observe in client websites, is a lack of contrast resulting in a fail of this particular checkpoint.

Contrast in this sense means the difference in color and brightness between the foreground compared to the background, especially text to background. Very common issue that there isn't enough. So here's four examples. Take a quick guess, which ones of these do you think would pass our accessibility guidelines here for having sufficient contrast?

I went back you guess for long. The one on the left you probably figured out, there's not too much contrast between the light gray and the only slightly darker gray. There's a contrast ratio of 2:1. That fails. The score actually looking for here is something like 4.5:1.

So the second example a darker gray on the same background passes. It's got a ratio of 6:1. At AA… as we move to that AAA success criteria, we need to be over 7:1 for our contrast ratio to pass. But if you thought the one on the right, the most contrasty might pass, well, it does… but it has a separate issue! Which is, there's quite a bit of evidence that having too much contrast, or a 100% contrast in this case can actually make things harder to read by people with certain types of specific vision issue or learning issues, such as dyslexia. This will miss. The hard contrast will cause the letters to swim even more.

So really you're looking for something in that kind of sweet spot above – well above sort of 4:1 in the contrast ratio. How do we measure this? Well, I'll tell you a story about why it's not a good idea to guess in a minute. I tend to use a free tool called the Colour Contrast Analyzer. It's free. It's easy to use. It's PC. It's Mac.

It gives lots of explanations as to what's going on, and also they spell "colour" the correct way. So I love it.

Very handy tool, and it can also help you out with the other sort of often overlooked guidelines within the contrast rules here. So here's one. There is a clause which says that if your text is large enough, you can be a bit more forgiving around your contrast ratio. So a smaller text of 18 points in this case – sorry, 14 points would fail at this particular contrast ratio, but if you bump it up above 18 points, then it's a pass as you see, large text. That can be very handy when you're dealing in brand colors and that kind of thing, where you might not have as much wiggle room there.

I mentioned earlier that the WCAG has been updated to 2.1. And one good thing they did in their update was they clarified the language around contrast for interface elements. Designers did tend to understand that text and background needed contrast, but now we're really, um, having it drilled in that our interface elements need that contrast as well.

In this case, in form boxes. If there's not enough contrast on your form boxes, they're going to be like the example on the left: practically invisible to the large numbers of people who have low contrast perception vision. So you need to test for that as well.

And I mentioned ah, you know, why you don't want to eyeball that. So, up until yesterday this whole presentation here had a very attractive orange heading color which looked very smart and kind of made the whole thing a bit more cheerful. Right at the last minute. I decided to give that a contrast check. I figured it was, it looks fine, plenty of contrast there. Unfortunately, no. It does pass at the large text size, but it has way less contrast than I thought it would have. So we had to go back and change that. So that's an absolutely classic example of

A.) me not listening to my own advice, and B.) the massive importance of testing color combinations at the outset of a project, and not right at the end when you're about to deliver it. So, fairly vivid example there.

To prevent that kind of mess up, what we'd normally do in our design work is we use a tool such as Stark, which plugs – is a free plug-in, plugs straight into common design tools like Sketch, Photoshop, and it will give you a very simple color readout, contrast readout to make sure that as a designer you are selecting appropriate combinations, way early in the process, before these types of problems get to propagate downstream. Yeah, you don't want to do that. Don't be me.

Second most common issue, #5 in the design arena: "is the text an appropriate size and font?"

I'll just talk about size, rather than typefaces here. While WCAG doesn't actually specify what an appropriate size is, most people will interpret that to mean text of, you know, 14-15-16, 16 pixels especially, as a good starting point for text you want people to read. If you're doing something in 12 point, then don't expect people to read it. Really try and avoid that.

I know, again in the medical realm we're often having to put disclaimers on things which you know, legally they have to be there. Maybe we're sort of going "well, maybe people don't need to read that?" but, but really we should try and avoid doing that at all costs if possible. But definitely for the important copy, 16 pixels and above is the good starting point.

And there's a related rule I want to touch on there, which is: the most common accessibility adjustment people make is expanding the text in their browser. That common "ctrl +" keyboard combination, which bumps up that small text to a bigger size. And there's a specific guideline around ensuring that that works well.

Sometimes you do that and the text gets bigger

but the layout breaks and the whole page gets a mess. There's a specific guideline which says we should be able to resize our text easily, without using any fancy plugins or anything else, up to 200%, as in this example on vox.com there.

#6.

Marli: Our last area of perceivability is quite simply: are using more than just color to convey information?

This is so important in health care. I said it before, I'll say it again. We have so many forms. We have privacy forms. We have history – patient history forms. We have new patient forms. We're constantly filling out forms. And as more things are becoming digital, well, that's great except that often you don't have the person who might have been

there in your provider's office or in whatever waiting room you are in to help you out with it.

And so instead we try to duplicate that, or remedy that by adding things like colors. We say "well green says that you're doing it right, red says stop, take a look at this."

Great, except as James said earlier 7% of men are colorblind, and a slightly lower percentage of women. Plus we're not being inclusive. Other cultures, particularly a lot of Asian cultures don't see green is good and red is bad. And so we need to do something not necessarily instead, but at least, at the very least in addition. And one very simple thing to do is just to add icons. Adding a check mark, which does typically mean okay, although again, you need to check those icons if you're working with additional cultures because checks are not always a good thing. And you know, in this case the red "X" to mean stop. Plus you can add alt-text to those icons in a way that you can't add alt-text necessarily to just colors Themselves.

With that we'll be moving on to our second section, Operability.

So now we know that your content and your design can be perceived. It can be "seen" but can it be used? And the one area that we're going to address here is specifically links. I mentioned earlier that piece about click versus tap versus select. Well, there's also just another problem with "click here," which is in the same way that screen readers can be sent to read just the images. They can be sent to read just the calls-to-action: the links and buttons on your page. So maybe you have on your homepage a section that says "We have the best breast cancer specialists in the state. Want to meet our Specialists? Click here." All that someone's going to see when they use their screen reader, all they're going to hear is "click here."

If instead your section said "We have the best breast cancer specialists in the state. Want to meet our specialists? and then had "Meet our Specialists" – or even, you could have less text than. You could say "We have the best breast cancer specialists in the state. Meet our Specialists." as the link, then without the rest of the context that link alone still make sense.

So, you can see the example here of 27 links all saying "click here." The screen reader just reads "click here; click here; click here; click here." But if instead it said things like "read about accessibility; fill out a contact form; see more case studies; learn more about cancer." Here we have a number of different items that even seen without any context makes sense.

And if you're thinking, "sure those are some great examples, but how does that work when I'm trying to create my own?" Well, I came up with a little secret that we can use.

A bit of a formula. Whereas "download" or "click" is a verb, and you might think "oh great. I'll just use a verb and a noun," but "download PDF" still isn't a particularly descriptive way of looking at something. If you ensure that you're using a verb and then a *descriptive* noun – sometimes an adjective and a noun, but you know "download pretty

PDF" isn't useful. So it really needs to be descriptive of what you're trying to help somebody do, then you'll get things like "download accessibility PDF" and while it is longer than "click here," it's worth it. And it's certainly not as long as writing out the entire title of the PDF, and getting into any sorts of issues with that.

You really just need the verb and the descriptive noun. And that moves us on to Understandable.

And these last two items within understandable really get at the heart of content. The first one is the readability level.

I love thinking about readability level. There are such great tools here. The one that we're showing here is [readable.io](). And the way that readability works, there are a number of different types of equations used. The one that is most frequently used is the Flesch-Kincaid grade level. And Flesch-Kincaid says, essentially "yes, you may have read Shakespeare when you were in high school, but you didn't read it just for fun and you certainly didn't skim it when you were stressed and in a crisis, right?" And so our health care information can't be at a 12th grade reading level. It can't be like reading Shakespeare.

Our health care information needs to be at a sixth grade reading level or even below. And so you use tools like [readable.io]() that tell you that our content – that that sentence is too long. That you've got too many long words in it. That there are too many ideas going on at one point. All of these different things that work together to make up the readability level.

And the other piece that we need to pay attention to with readability is the health literacy itself. Health literacy is defined by the Department of Health and Human Services as "the degree to which individuals can obtain process and understand basic health information and services in order to make appropriate health decisions."

That's a mouthful. Definitely not sixth grade reading level. But the key thing to remember with health literacy, is that it's not linear. You don't get up to a 12th grade reading level and then stay there. With health literacy we start at a basic level, and a basic level means that you understand what you're filling out when you fill out a form. Then we get to the interactive level, of interacting with your provider, knowing when to ask questions. Some of that's confidence as much as anything else, and some of it is knowledge about what you're talking about. and then there's proficiency.

And much like with accessibility, this is all about point-in-time. At any given point in time 12% of Americans have a proficient or critical health literacy. And for example, I have a proficient level of health literacy on a day-to-day basis, working in health care. But if you told me tomorrow that someone I loved was in a car crash or had been given a terrible diagnosis, my health literacy would plummet to below basic. I would struggle in that moment of crisis to fill out forms. And we need to remember that. That most most times when people are interacting with us, they do not have proficient health literacy. They're likely at basic or below basic.

43:47

So again that readability becomes even more important. And this great example, it's probably I think James' favorite example that we have in this presentation. The NHS, in the UK, redesigned their website and their style guide to ensure that not only are they avoiding jargon, but they're not going to use words like "urine" if they can use a word like pee. But they're also going to consider what that make somebody think of and if they're going to have a negative reaction to it.

They need to take all of that into consideration. And so do you.

And last but not least, error messages. Are our error messages clear and helpful? This… there is so much that can be said here, but really similarly to readability. We need to understand that the moment that somebody hits an error message, they are in a small crisis. Things are not going the way they wanted. This is a negative moment for them and it's going to get… just worse, if all that were telling them is "you can't do it. You can't do this. Something went wrong."

44:56

A lot of times, this is an area where you need to be really good friends with your compliance team, because they're going to be saying "for security reasons – particularly when it comes to passwords – we can't tell you if it's your username or password that was wrong. We can't tell you why it was wrong."

And so you really need to work with them, and go back and forth and figure out how detailed can we get? What information can we provide that would be helpful in this moment? Because there's got to be something better than even here, where we're saying "Your username and/or password do not match." It's at least better than just "You can't log in."

45:30

But what if we could also say who to go to for help? Or *where* you can get more information, even if we can't tell you what the steps were to create your password, because that would be that would compromise the security of the application. There's always *something* more that we can do, some way that we can help. It just takes a little creative thinking. It's not as cut and dry as "Compliance said no, so we're just going to have to say you can't log in." And that is really our responsibility, to make that happen.

46:03

Those are our nine, but there are some other checks. James?

46:08

James: Thank you, Marli. Yeah, so those are the, like, top nine most common. Especially in the health care realm. But following those top nine does not give you a WCAG AA-level compliant website, or at least not a fully one. You'll have dealt with many of them are common issues for sure, but to actually get to that coveted level of accessibility, you need to be thinking about the full WCAG checklist. So we'll share some links to that.

You follow the checklist of the best of your ability, but then you need to check that it's actually worked. And there we tend to use a combination of tools. So our developers might use what they call a build-chain validation tool. So as a site is being built, so automated tests are going on. The research team might be undertaking some heuristic

evaluation or like by-hand evaluation to see how it's working. Or you might rope in some users who actually do use assistive technology, to give it a really thorough user test.

And that's probably the gold standard for ensuring that something is truly accessible – accessible and usable at the same time. If you're just a team of one, there are definitely some free audit tools. So there's even a really good one built into Google Chrome. It will automate as much of that testing as it can, and then it will tell you the things you need to check yourself. So different approaches there, to get you to that high level of accessibility. And we wanted to just spare a few minutes and I see we do have a few minutes to walk through an example of where we've applied some of that thinking – that checklist of nine things, and the full process to one of our own projects. And this one starts with a question. The question is "when is the right time to think about accessibility?

Is it after the fact, as in the example on the left, or is it as an integral part of the design process here? And you can probably guess what we think the right answer is. And this by the way is an example from Laura Kalbag's awesome Accessibility for Everyone book. If you get one little book on these kind of things, I recommend that one.

So that was the mindset that our client Harvard Pilgrim had when they came to us. They had a previous website which was not terribly accessible, and they were trying to apply accessibility after the fact, and then they took the brave step of going. "No, ok, we're going to rebuild from scratch and we're going to consider accessibility from the get-go and we want to work with a partner who understands accessibility to get it right from day one, and all the way through the process." So they came to us.

So, how did we go about it? Well one thing is we didn't use the old process for making websites. We don't anyway, but the previous website was probably made with some variation of a waterfall software development process where you gather the requirements to design some graphics, you build a site, then you write some content to put into the site. Maybe you have some accessibility requirements. Maybe you looked at them at the beginning of a project, now you do some testing at the end,

the test says it's broken, and what do you do – do you ship it or do you do a lot of expensive remediation? We don't like that process. We much prefer a build-test-iterate way of building an actual website. So, delving a good deal deeper into user and business needs rather than just reading a set of requirements. Working with an accessibility level, and breaking down each bit of the work as a testable concern. So testable from a usability point of view, testable from an accessibility point of view as well. So as we're generating content, as we're coding prototypes, as we're creating graphics, we're considering accessibility and other UX factors every step of the way.

I'm just going to go through a few of those particular steps here, to talk about how we might go about doing that. So, research is always at the heart of everything we do at Mad*Pow. We do a lot of ethnographic and surveys and interviews and studies. When it comes to accessibility

it's no different. You want to interview stakeholders who understand assistive technology. You want to talk to users of assistive technology. In this case we worked with our partner the Carroll Center for the Blind who are near Boston, who furnished us with many people to talk to on accessibility issues, and they come back into the story later on.

For day-to-day use, particularly to familiarize our developers and designers with accessibility criteria, we also worked with a set of accessibility personas. You might be familiar with using personas in other types of UX work. Well an accessibility persona simply adds in the type of detail you need to start considering the specific accessibility needs of different people. These days if we're running a project like this again, we would probably aim to do something like a Participatory Design Workshop. This is a fantastic tool for tapping unmet needs.

51:08

And this is great for accessibility, because the checklist for WCAG will tell you broadly what to do. It won't really tell you how to make an awesome experience or an especially useful experience. That's not its job. Its job is to tell you how to be accessible.

But if you can bring in an inclusive and diverse audience into a Participatory Design Workshop, then you can tap all kinds of hitherto overlooked needs, discover that as part of the design process, and then bring that into the product or site or service that you're making. So we heartily recommend that as a way of advanced need-finding and really gaining that empathy for the users you're trying to reach.

I know we're a bit close on time here. So I'll just step through a couple of the other steps here. Earlier on I shared that embarrassing example of not testing color. Well in production work we would never do something so foolish, of course, so we work with style tiles and style samples.

52:08

Rather than designing a complete site from scratch we work in stages to make sure that each design idea, each color, each font even, is fully validated for accessibility in solo or in combination, so that everything's kind of checked out from the get-go. Similarly in the content process, this particular project for Harvard Pilgrim was mostly about refitting their old content. So we could use the grown-up enterprise version of that Readable product that Marli mentioned to scan an awful lot of content and identify problem areas from a grade reading level as part of our process of identifying content that needs to be rewritten.

A key part of that is identifying any multimedia. It's got a lot of video tucked away in this site. Was there an alternative accessible version of that content in there? And if so, could we create one as part of this.

Accessibility work really shows the value of prototyping in code, and prototyping mobile first.

53:08

Rather than leaving the content to the last minute, we want to bring the real content into the actual design and make sure that we're structuring it properly for screen reader use, that it's been coded properly, and that it flows well for all users, particularly users of

assistive technology. And this is especially handy when you're trying to solve some of those hard problems.

I mentioned ZocDoc right at the beginning there. It's otherwise a really well-made website, but they had this issue around their booking system. When we were building the Harvard Pilgrim site, we fairly early on realized we had a big problem with our Find a Provider tool. It's pretty hard to do, the good UX that people expect for that, like a type-ahead with spelling forgiveness, and other sort of expected but actually quite difficult features to do, especially in an accessible way.

54:00

But by building in code early on we were able to get ahead of those issues way before deployment, and saved a lot of grief later on.

The result, a lovely looking website if we do say so ourselves, and one that was fully WCAG AA compliant at that point – or at least as far as the checklist was concerned. There is always you know, our gold standard I mentioned earlier, is the checklist and the validation tool might say you're accessible, but you don't really know for sure until you sit down with the screen reader user and observe them trying to use your site.

So we were completely legally in checklist compliant. But once you actually start listening to somebody using a site using the screen, you pretty much always find some issues you couldn't have foreseen otherwise around how things are worded or how they come across over a screen reader or new ambiguity which a validation tool would not have picked up. So our Boston lab is well equipped for that type of accessibility testing. Here it was set up for a child study for another project.

55:08

And again our friends at the Carroll Center are very helpful for providing screen reader user test subjects for that type of experiment, or that type of validation.

So very quick view there. Love to talk more about this project because it's a super interesting one from both from a health perspective, a patient education perspective, and an accessibility perspective, but I'm afraid we're out of time.

So I shall turn us over to the closing section here. Marli?

Marli: Yeah, obviously we could barely fit in an overview in an hour, and I'm sure that your brains are bursting at this point, but we did want to make sure that we left you with something truly actionable.

You know, a webinar like this shouldn't be a one and done. Hopefully this will inspire you to go forth to download the PDF right here from GoToWebinar, or if you were struggling a little with that or don't see it, we're happy to – we will email it out to you tomorrow as well.

56:08

We're just so pleased that so many people are interested in making a more accessible health care web. And so we are creating a list of resources, we'll be sending this out to you tomorrow as well to help you on your journeys, and we're both available on Twitter.

If you have left questions, please make sure to include your Twitter handle so that we can get back to you, and don't forget to sign up for the Center for Health Experience Design for more updates and more information there.

Kathryn: So thanks so much for attending. And just to let you know, I know we just bombarded you with a ton of information, but we also want to know that we're here to help, and we can help you with any of your design and innovation goals, such as research and strategy whether it's accessibility related or other. User experience design and development, service design, intervention design and evaluation, or design and innovation challenges.

57:06

If you have any questions, our emails are on the next slide, I believe.

57:11

Yes, so thank you so much. All of our Twitter handles are there at the bottom and so if you want to tweet us questions, we're happy to answer them over Twitter. If you have any specific things you want to address us with feel free to reach out to us. And as Marli said we'll be sending out the recording as well as the PDF of the presentation and that nine steps handout. We will also be posting it on our website. So if you want to check back at a later date, all the information will be there as well.

57:45

So, thank you so much for attending and go check out Centerhxd.com for upcoming events, webinars, workshops or networking things. So, so glad you took the time out of your day to join us, and we hope to see you online soon. Thank you!