Tom Burton: Thank you, Brooke. I'm super excited to share some things we've learned and the things that I'm especially excited for all of you to see what UC Health has built, which I think can have a tremendous impact for clinicians and save them time and save your organizations a lot of money. The main concept we're going to be covering today is how we learn, and I want to really distinguish between familiarity and mastery. You can see the picture here, every kid is familiar with running around a track. That's different from being at an Olympic level. Next slide.

I'm going to be talking about how mastering competencies can dramatically increase your revenue, decrease your costs and improve your quality. That'll be the first learning competency we cover. The second, next slide, will be Brent James and Bob Burgin talking about how new tools and technology can significantly enhance the speed and depth of learning. Then finally, we'll have UC Health share what they've built, how they've leveraged these new tools to really impact the way that clinicians learn the EMR, and spend time mastering the skills needed in the EMR, and I think we'll even get a chance to show a demo. So, we're all dealing with the new normal and it's requiring us to compete at an Olympic level in a number of new ways and new areas. It's almost like we're in a decathlon. The real question is, are we ready? And, how in shape are we? Next slide, Bob.

If you think about it, there's a lot that we need to do. We need to improve revenue, we need to reduce costs, we need to improve quality, and it's almost like these different events require a combination of skills. There might be some core capabilities that are required for all events, and then there are some individual skills and knowledge needed for each individual event. Next slide. If we think about an Olympic athlete preparing for these events, next, you can think about some of the core skills like integrating your data, finding insights from that data, kind of like strength training and cardiovascular conditioning. Strength training could be really getting the analytics right, and then using those analytics to identify where you actually need to improve.

Then there's also independent specific skills for hurdles or javelin like in the Olympics. There may be some very specific skills needed for these different clinical, or financial, or quality areas of skills needed to improve. Next. So, we think about analytics literacy education as a core foundational component, improvement literacy education, and then embedded education in a specific area. UC health will share one of those embedded areas, specifically how to learn in a more effective and efficient way, what's needed to really operate your EMR effectively.

Now, here's the challenge. Success requires new knowledge, skills and attitudes. And unless those new competencies are developed, organizations are going to struggle to succeed. Next. So, there are different roles. There are executives who need to fund and set the priorities for what's improved, what is learned.

There are frontline managers dealing with the day-to-day challenges. There are analytics engineers that are trying to find insights. And, there are improvement teams that once those insights are found, are actually trying to change behavior, change the process, and improve and get better outcomes.

Each of these four roles are critical, and those of you who have been on a webinar with me before know I often talk about, what are the key things needed for change? You need to know what you should be doing. That's the best practice. The analytics help you to show how you're currently doing in the gap, but the hardest one is adoption. How do we actually change? That's where investing in education, investing in knowledge, skills and attitudes makes a huge difference. Next slide. So, we're going to open up our first poll question. Brooke, will you open that up for us?

Brooke MacCourtney: Yes, I will. All right, our first poll question is, which role at your organized do you feel has the largest analytic and improvement literacy gap? Your options are executives, analytic engineers, frontline managers, or improvement teams. We'll give you a few seconds to answer that. And thanks for answering our polls. We'll add a few more throughout the webinar, so we appreciate your responses. All right, I'm going to go ahead. Getting some more votes in. Maybe a few more seconds and I'll go ahead and close that poll, and I'll share the results. So, it looks like we have 34% said executives, 4% said analytic engineers, 57% said frontline managers, and 5% said improvement teams. Is that what you expected to see, Tom?

Tom Burton: Well, the numbers are higher for frontline managers and executives. I thought it would be more evenly distributed, but that's really interesting. We have actually seen, there are usually some significant gaps. Oftentimes we'll hear things like, "I don't have the data I need." And oftentimes what they're really saying is, "I don't know how to interpret the data." It's not like they don't have a login to the right systems or they don't have access to the data. Many times it's, they don't know how to interpret the data and then use it for improvement. That's why Health Catalyst has put a lot of time and effort into those foundational levers of analytics and improvement literacy, and we've actually built some really exciting things. Now, over the years we've had that, but it's been hard to scale and I want to talk about this principle of scaling. Next slide.

Well, and makes it even more challenging as we're in the new normal with more virtual learning. But the real challenge, next slide, Bob, is this concept of seat time, versus competency based. Seat time is where you might hear things like, "Have you gone through the two-hour mandatory HIPAA training?" It's measured in hours and it's all about familiarity. That's different than actual competency based education, which is really measuring, have you mastered and applied the knowledge and skills? That's measured in competency learning units and it's all about, can you really use the material, the knowledge that you've learned in a real life setting? And that's not time based, that's based on the

complexity of the concepts you're trying to master. It's a competency level, whether it's a knowledge, skill or an attitude.

Now, this is much more challenging than just checking a box saying, "Hey, I attended my HIPAA training this year." Next slide. Mastery at scale requires the right tools, and this has happened in a lot of other industries. You see some examples here, going from writing to a printing press, to a massive printing press. Different industries have scaled and created mastery in that particular area. Next slide. This is hard in learning. James Garfield once said, "The ideal college is Mark Hopkins on one end of the log and a student on the other." The reason for that is, Hopkins could tailor and change the learning experience for that individual student and understand where they were in their knowledge or skill, and adjust what he was teaching them based on what their current state of understanding was.

Well, that's hard to do and typically in a classroom setting, we often end up at the lowest common denominator. We're teaching and some people are bored, and others it might be going too fast. That's when we got really excited about Amplifire. Brent James actually introduced us to Amplifire. What's so exciting about Amplifire and what you'll see today in the UC Health demo, is the ability to tailor the learning experience to the individual learner which massively improves the learning experience. So, I'm going to turn it now to Brent James. He's the one that introduced Health Catalyst to Amplifire. We've now formed a really exciting partnership. Brent's going to share his experience with Amplifire, Intermountain Healthcare, and why he connected our two organizations. Brent?

Brent James: It's a really funny story, Tom. I was the guy at Intermountain when we had people with brand new ideas that were going to solve the world that would come in and want to present, I was the sacrificial victim who had to listen to them. I'd go spend that hour, try to give them good points about where this might really go, how real healthcare operations worked. But occasionally, occasionally in doing that, you'd hit something that was truly intriguing. That's what happened to me that day. Bob Burgin was visiting. Newly formed Amplifire were working into healthcare. In his presentation, I realized he might actually have something that could work.

Now, a little bit deeper background, I run the ATP. In over 30 years, trained more than 5,000 senior healthcare executives, mostly physician and nursing leaders, some C-suite people, some support staff in clinical quality improvement. I had to do a project to graduate and I had a rule, "Guys, anytime you try to load the information into some professional's mind and expect them to apply it consistently and accurately over time, it's not going to work." The evidence is overwhelming. You'll get a little bit of a bump, but then it'll tend to fade away very rapidly, so I basically taught for 30 years that education doesn't count. It's a necessary foundational element, but not sufficient. Bob showed me a method that looked like it could really cause change, permanent change,

systematic improvement on a broad scale over time. I'll leave it up to Bob to share what that was.

Well what I did, I went to our CNO, Kim Henrichsen. She assigned one of her strongest assistant CNOs, Tammy Richards. We decided to run an experiment and Tammy put together an initial Amplifire model for CLABSI, central line-associated bloodstream infection. What we saw with that was a fall of about 30% in our real CLABSI rates, and it was significant. More than that, the time our nurses spent in the training dropped by about half. Even more than that, the nurses liked it a whole lot better than the training we were doing to them at that point in time. Well, that's how it triggered. I'd finally seen a science based education method that looked like it could make a real difference. Tell you what though, Bob, why don't you show them what we're talking about here? The thing that intrigued me so much when you first showed it to me?

Bob Burgin: Brent, thank you. It's of course, an honor to try to solve these problems with you. Let me just dive right in. We run an alliance of health systems who have seen and agreed to use this training methodology I'll show you now and build the courseware. Brent's team built the central line-associated bloodstream infection, UC Health that you'll talk to next built the no classroom EHR training, and what ... Our model goes like this. A system raises their hand and says, "I have a problem I want to solve," and we approach it with three things that are unique. Thing one is, we build the content from adverse event, backwards. We want to look at where problems happen and where known mistakes are, and target it. Average time to complete one of our courses is 27 minutes, so they're intensely focused.

The second is, we deliver them in the platform that I showed Brent and that he just talked about, and I'll show you now. And then the third is, we remain intensely skeptical of where the training might come up short. We do analytics to find where the training did not succeed and we provide the tools to support the organization. To really understand why this is working and why it's so different, I have to back you up in time a bit. 50 years ago, there was a patient experiencing severe epileptic seizures, and his surgeon did a radical procedure and removed part of his brain, the bilateral hippocampus. That patient lived 30 more years and never made a new memory, lived into his 80s and never made a new memory. The psychiatrists who saw him 500 times and studied his brain began every meeting with an introduction of who he was, and why was there.

Not a lot happened for 30 years, even though we now knew as a species that all new learning goes through a single part of the brain until this guy, Dr. Dan Schacter at Harvard began pointing functional MRIs at the human brain 20 years ago, and presenting information in different and creative ways to figure out when that neuro-mechanics of learning, the hippocampal activation was occurring and when it wasn't. 10 years ago, I hired Dr. Schacter and Dr. Bjork from the Center for Learning and Forgetting at UCLA, five others and I

hypothesized to them that having read their research, a computer algorithm could in a very disciplined way follow the techniques that work to hijack that neuro-mechanics of learning.

I'll give you a quick example. We know that when you present a physician with a challenge about how to care for a patient in a scenario, the prefrontal cortex activates, but you get very little hippocampal activity or activated learning. But if at the moment of answering a question you say to the nurse or physician, "Hold on just second, how sure do you feel about your answer?" The amygdala region of brain fires, and that matters because when the prefrontal cortex and amygdala fires at the same time, you get hippocampal activation. In other words, learning occurs, measurable learning occurs. So, you'll see some techniques that we've developed with these scientists. We've been working with them for just over a decade now. We are meshed in this brain science.

Here's a quick look at the platform from a clinical perspective, and we'll get into the UC Health Epic learning. We begin with a burst of micro testing. It lasts about 90 seconds. Here's a scenario where a physician says ... This patient appears in your emergency department. You can click into the interactive and see that it's a septic patient. You've got a half fluid bolus. It's clearly not effective. You've got the second half of the fluid bolus still not effective. Showed up in your care in this condition and the question rings, what should happen next? We rolled this course out at 23 hospitals across the country in the same month, 47% confidently held misinformation on this question.

So physician says, "I'm going to start treatment for severe sepsis, while this patient's clearly in septic shock." The system says, "You only filled in half the bubble." It says, "Are you declaring you're unsure." The physician says, "No, I'm sure about this," and the system says ... He submits his answer and the system says, "You're showing incorrect, but I'm not going to tell you the answer yet." This was a shock to me. It seemed to me that we should teach right now while we have that physician's attention, so we tested it. If you give the answer now, you get very little hippocampal activity, meaning very little learning. We don't know why. None of the brain scientists can confirm why, but it's as if the hippocampus says, "No need to store this. Every time I need it, you give me the answer."

If however, instead, we tested timeframes on this, if you move on to something else for as short as 15 seconds and then come back to it, the hippocampus says, "Oh, I've seen this before, wait a minute," and stores the information. So after 90 seconds of testing six or eight questions, we jump into a learning burst. Importantly, you get the exact same visual where you had that moment of, "What? I knew that," and then we teach. And after the first round of just over three minutes, we now know a little bit about this learner. Confidently held misinformation on these two items, confident correct tested out on these and various forms of knowledge gap on the other.

That informs what we see next, and we repeat the cycle. 90 seconds of micro testing, three minutes of learning. The questions look different in later rounds, and we stay with that learner until they've mastered all the content. And as Brent noted, training times reduced in half. In the EHR they've reduced as much as 86%, because you test out of what you know and the system gets intensely focused. But I said earlier, the third thing we do is remain incredibly skeptical. This is 3,700 nurses taking a course in central line-associated bloodstream infection. Across the top is the content, these tiny rows each is a nurse. You can see if you blow up the top and the middle and the bottom, these nurses were real experts in central line-associated bloodstream infection and they just needed a little gap fill. Completed a one-hour CEU in nine minutes. The average was 27 minutes and you can see a tremendous lack of knowledge, all sorts of knowledge gaps.

And then this group of nurses, the red, is confidently held this information on first pass. A lot of misinformation in their heads. They turned it all great, but I told you we remain skeptical. So underneath the green, we produce a visual heat-map of each learners journey on each item. The gray here means that we didn't teach them, they knew it. The blue and yellow, they learned efficiently. And with 2.6 billion learner interactions in the platform, we can tell you that on those blue and yellow items, that learner is performance ready. But where you see orange and hot pink, we're skeptical whether they understood that or not.

So what we do is in the analytics dashboard, we blow out the risk variable. This is the profile of risk at that hospital at their initial knowledge in the platform. These are the items they turn green but we're skeptical of, and the system dynamically produces a customized refresher training of just these items for each person. It takes about six minutes to complete. We push that at about six weeks. And fortunately as we always try to be, we were overly skeptical, and these are the only items they haven't learned, and then the system produces consultation reports. Then with each system, we do efficacy studies. It says, "Did it work?" In this case, we rolled out the training here and the refresher here, and we saw a 51% reduction in incidences of central-line associated bloodstream infections. This was a $100,000 investment that returned 1.7 million of reduction in unreimbursed care. Brooke, with that overview, I'll turn it back to you for the next poll question.

Brooke MacCourtney: Great. Thanks, Bob. All right, our next poll question we are asking you, what percent of your organization's education is seat time versus competency based? Your options are all seat time, mostly seat time and some competency based, half seat time and half competency based, some seat time mostly competency based, or all competency based. Looks like we're getting some votes in. We'll give you a couple seconds to vote. Thanks for voting. Looks like we're leveling off. A couple more seconds. Okay, I'm going to go ahead and close the poll, and we'll share the results. It looks like 20% said all seat time, 51% said mostly seat time some competency based, 14% said half the time half competency base,

13% said some seat time mostly competency based, and only 3% said all competency based. What do you think of those results, Bob?

Bob Burgin: Well, they show what we see, which is a lot of smart people are trying really hard to do this right but lack the tools to do it.

Tom Burton: You know, it's interesting, Bob. I see a lot of seat time training still out there. They may have switched from classroom training to online training, but it's still seat time base. It's not measuring competence, for example, and what you just demoed. That's really competency based. When you're measuring both, did you get the right answer and you're confident in your answer, that's where you're getting closer to competency based training and Amplifire does that so well. In fact, we've transitioned all of our internal training onto the Amplifire platform. We have over 300 analytics engineers who now have all of their training based in this competency based training that's around their analytic literacy.

One of the great things that the Amplifire platform does, it also allows you to do a spot check or once you've built a module, you can actually take a subset of those questions and ask just the question portion. Just, "Here's a scenario. What's the right answer, A, B, C, or D?" But then, how confident are you in that answer? You just do a subset of the questions and it gives you a good idea how someone will do on the overall module. We have now developed this and we're offering this free spot check to say, how is your organization in analytics literacy and improvement literacy? Those foundational components that help you in any Olympic event. It's like the cardiovascular and strength training. So we would just be curious, how many of you would be interested in your organization participating in a free analytics and improvement literacy assessment? Basically, the question only portion of the type of competency learning that Bob just demonstrated. Brooke, will you open that poll?

Brooke MacCourtney: Yes, I will do that right now. All right, we'll give you a few seconds to answer. If you're interested in a free competency assessment of your organization's analytics and improvement literacy, please answer yes to this question and we will follow up with you after the webinar. We'll give you a few seconds to respond. Looks like we're getting some responses. All right, we will go ahead and close that poll. Thank you for responding, and I'll hand it back to you, Tom.

Bob Burgin: Thank you. Let's move to the main event. I got a call two years ago from UC Health, and they were already a development partner and active member of the alliance. They proposed to me that they'd done a thorough analysis of tools in the market and wanted to build Epic training in the platform. I was a bit skeptical whether we could pull that off, and encouraged to start with just one module and see. Now, let's begin with the end in mind. They built the course, ran their studies, rolled out at Brigham and Women's and others, most recently Cleveland Clinic where they replaced an eight-hour classroom training, and the

average time to complete was an hour and five minutes with improved performance.

That is an extraordinary outcome and it's a real pleasure to introduce you to the folks that lead that development. I'm excited to introduce you to Steve Hess who's the CIO at UC Health, Dr. CT Lin who's the CMIO, and Lori Reece who ran the project, and with Steve's gracious agreement has now joined the alliance full time to help others roll this out and deploy it. Steve, thank you for being here. It's an incredible thing you guys built, and appreciate you sharing it.

Steve Hess: Thank you, Bob. It's been great being your partner. So, next slide. UC health is a large health system. We're an academic medical center and 11 other community hospitals to make up a 12 hospital system. About 2,000 beds, 4 million ambulatory visits, 25,000 employees and so on. We've been on a single Epic instance across that footprint since 2011. We consider ourselves a fairly mature informatics IT organization delivering for UC Health, but we were still doing classroom training in 2018, the old seat time based as Tom and Bob just went through with you. We also had some experience with the clinical side of Amplifires. You heard Brent talk about the CLABSI module. We looked at that, we implemented that, we looked at some other clinical modules.

So what we did, next slide, was look at how we could really transform the way that we're delivering the IT training across that system, using these tools that were very applicable in the clinical setting. Just to give you a perspective, we were training just short of 6,000 clinicians every year, onboarding them. Colorado is a very Epic-centric state. Lots of health systems that are running Epic in Colorado. What we were seeing was about 6,000 new clinicians coming to us every year or refresh training, and we are seeing a tremendous amount of increased Epic experience to the point where over 60% of the clinicians coming to us already had some level of Epic experience. And yet, we were still doing classroom training, four hours, eight hours depending upon your role and it just seemed like it was really backwards.

So, we put two and two together and we really wanted to revolutionize the way we delivered training. We saw what Amplifire was doing on the clinical side and as Bob stated, we came to him and his team to say, "There's got to be something here with EHR training. We really want to work together and revolutionize the way we deliver training. We got to get the clinicians out of the training room. We got to make sure they're equipped with the specific organizational knowledge that they need to do care at U Health, but we got to get them to the bedside, or into the ambulatory setting much better and faster than we were."

But as importantly, we also knew that we were not alone. We knew that based upon our experience with other Epic clients with Cerner and Meditech and others, that this was not a unique problem that was at UC Health. So what we

were laser focused on was not only delivering a solution that would work at UC Health for our clinicians and our training teams, but wanted to build it in a way with Bob and his team so that it could be shared with other systems, and that the rising tide would raise all ships." Next slide. What we really wanted to do was bring those trainers out of the classroom, turn them into coaches, and really have an individualized trainer profile that then we can have those coaches help with this specific learning intervention.

As Bob walked through some of the Amplifire intelligence, and it is intelligence. This is not just E-learning outcomes and so on. This is really intelligence around individualized learner profiles. Each one of those rows in those graphics that you see there is an individual. So if you think about what we've done in the past where we've trained a classroom of individuals in mass essentially the same content, the same pace, driving all kinds of people nuts, actually probably moving too fast for others, we really want to turn that experience into a way to deliver intelligence to both the learner and to the instructor. To the trainer and to the coach, and actually then have very specific individualized interventions. This idea of individualized competency, so important. And frankly, we're really just scratching the surface of what the potentials are. I'm going to turn this over to CT, our CMIO who really made this happen with our providers and our other clinicians.

CT Lin: Thanks, Steve. If we could go on to the next slide? So, our goal with Amplifire as we partnered on the EHR training journey was to shorten time to their proficiency, and get the physicians out of the classroom and under the floor where they are needed. Let's go on to the next slide. Unfortunately, this was a common occurrence for us. Welcome to UC Health, sit here for eight hours. And I'm going to tell a story at the end of this little slide here for a second. But your problem learners are going to be, "You know what? I already know Epic. What am I doing here?" Or, "You know what? I skipped ahead in the topics and I'm already done." Then of course we have similarly colleagues, "Can you go back? That doesn't make any sense to me." So essentially, nobody in the class is happy. There's no average way to make everyone happy.

In fact, the reason that we continue to insist on custom training for our onboarding folks, even for folks who've used Epic for years or a decade or more was the problem we had in 2011, where we actually very cleverly we thought, brought Children's Hospital residents from across the street. Children's Hospital had already been applied on Epic on a separate instance, and we had them come over and be coaches for our physicians at the elbow in the first month. Well, it turns out Children's Epic was configured differently with your admit order in a different place than where we had placed them and they were teaching our physicians to, "You know what? Skip to the navigator and go straight to the order set."

It turns out at the end of September, after 30 days of go live, we get a report from our finance department, "You know what? None of the patients admitted this month have an admin order." So, CT Lin becomes the physician signing the admit order for an entire month of admissions. I'm not going to do that again, because we're not going to make that mistake another time. Next slide. So, what we tried to do is take the Epic experience providers ... I'll walk through this on the left side, and then on the right side. Those who have more than six months of previous Epic experience and respect that they have significant expertise, but that there are unique things we must teach them.

That's what we put into the Amplifire course for over 30 to 60 minutes. And at the end of the course completion, here you go, login granted, start your work. So you're no longer saying, "We'll figure out whether you pass and if you pass we'll certify, and then we'll hand it over to another group to give you the login, and in a few days you'll get a login." No, you can start work same day. At the same time, we have a significant number of novice providers. It's about a third or so of our onboarding clinicians, and those with less than six months of Epic use or none, will have a self-paced lab first for a number of hours. And they have a coach available to walk them through the self-paced lab, followed then by the same Amplifire course, and then login granted and off you go.

The follow up to that is one-on-one sessions with the trainer. So instead of classroom, you really do have personalized care. It's not quite perhaps Mark Hopkins, but it's certainly very close because these trainers are experienced with optimization within our EHR. So we have focus content on days 1, 7, 30, 60 and 90. There are additional tools that we don't load on you that first day. Speech recognition tools, two factor authentication for ePrescribe, smartphone app tools. We show ideal workflow videos, so we take you through the best way to do a sequence of tasks to achieve a particular goal. And we reinforce the struggle topics identified with Amplifire as was seen earlier in the presentation, and then we start adding in Epic signal.

As you know, many EHR is including Epic now have user action logs. We can actually see how you're performing in the EHR and use that to augment the feedback loop to tell clinicians, "You know what? You're spending a lot of time and notes compared to your colleagues. Let me give you some tips to try to mitigate that." Then finally and we're very excited about is, adding to the existing onboarding Amplifire content, and then using our UC Health Sprint optimization for existing users. We're nationally known for what we've done with Sprint optimization. We're hoping to take that content and encode it within Amplifire as well. Next slide.

So, we're getting a feedback like this, can I take this again? Never in the history of training have I ever heard, can I take this again? I didn't know some of these tricks. It efficiently covered the Epic topics without having to sit through an unnecessarily long class. And, I liked that I was able to differentiate if I was sure

or not. In previous tools I just guessed, and they assumed that I understood. We're getting responses back that, this course covered epic skills relevant to mem, 81%, the tools unique question and answer format helped me learn strong skills, 82%, and I enjoyed ... Again, who gets numbers like this? I enjoyed the Amplifire experience. Next slide.

We wrote about this in the COVID-19 response among nurses. We trained 240 nurses, rapid onboarding for inpatient care. These were nurses in other care settings that we had to rapidly onboard. And, there's no classroom anymore during the pandemic, right? Traditionally it's eight to 16 hours with classroom training and then with Amplifire, it's a couple of hours self-paced online. We wrote about this in the JAMIA Paper, Clinical Informatics Accelerates Health System Adaptation. Feel free to pull that down for your reference.

Steve Hess: So, the way we thought about this training is not only did we feel like this was the right thing to do to get our clinicians out of the classroom as Dr. Lin articulated, well, we also felt like there's going to be fairly significant financial ROI. So, we actually spent some time looking at how much it costs to deliver training to those almost 6,000 clinicians each year across a fairly wide geography. Then what we did is we said, "Okay, now let's make some assumptions around the portion of the learners who would be those expert learners, the proportion of the learners who would be those novice learners," as Dr. Lin articulated. We actually did the work to come up with that ROI, and it's not trivial in terms of those savings.

For UC Health, what we saw is that on an annual basis, we're going to save in excess of $400 per provider, excess of $250 per RN, and about $80 for the techs, the CNAs and the medical assistants. From a cost savings or a expense redirection approach, it's actually pretty significant savings that we were seeing, in addition to feeling like we were creating an individualized learning experience that was going to pay dividends time and time again. So I would encourage all those that are interested in this new way of training, this new way of creating competency to take a look at your current cost of your training platform and what it's taking to deliver, and look at what this could be. I think this is a classic win-win where we can get those clinicians to the point of care better, faster. We can create those individualized learning profiles and those interventions with instructors who now are coaches and at the end of day, save money or redirect expense to the next generation capability. Bob?

Bob Burgin: Thank you, Steve. What you guys built is just extraordinary. I'm really grateful for all that work. I want to say a special thank you to Health Catalyst right now because they have decided to sponsor free analytics literacy, a free clinical literacy, and a free EHR training ROI and I just want to speak about those for a minute. Steve said look into your current costs. We have an ROI tool was actually built by another client who's about to roll out the Epic training at scale across about 25,000 people, a giant health system. They built this ROI tool and

so we started making it available to others. It takes a look at current classroom time and how much of that you can give back to the clinical floor. The tool doesn't try to claim revenue, it just says, "At this cost per hour, this many people ..."

If you look at the Cleveland Clinic example, eight hours down to an hour and five minutes, similar results, four hours down to 35 minutes at UC Health with increased competency from signal data. It allows us to sit with you as a health system and plug in your actual numbers. Who are the people you're training? What are your actual costs? Look at that, and then look at the reduced classroom resource requirements, the trainers, the instructional designers, all the infrastructure you have around it in a really detailed way. We do have a placeholder for the value of greater proficiency. We're averaging right now across multiple health systems about a 19.8% increase in signal proficiency scores, but we don't know how to measure that yet. There's a time study going on now at UC Health. We'll publish that data once we get it. We know there's value there, but we don't want to claim economic value until we can measure it.

So, Tom, thank you for your team deploying this and making it free. Anyone who's interested in just a minute will be able to click on a survey and the Health Catalyst team will follow up with you. What they'll do is show up and sit with your team, probably virtually, and go through exactly how you do training today and plug in those metrics so you can get an ROI calculator. Then the second is, Tom alluded to this earlier, it's just the same analytics literacy you could click on before. We're using psychometric metric data and point-biserial analytics to identify ... There are always five or six questions in every module that have an incredibly high point-biserial predictive value on how people will perform overall. We're taking that analytics data about the predictive nature of questions and creating a 15-minute spot-check. Tom, do you have any comments on this one? I know this is built by Health Catalyst.

Tom Burton: Yes. We've taken the courses that we provide to leaders, to executives, to analysts and improvement teams, and we've taken a subset. We've built now close to 30 modules in Amplifire around analytics literacy and improvement literacy. So, we've taken a subset of questions across using the tool that Amplifire provides, the spot-checker and created basically a 15-minute question only version that will really give you some interesting information on where your knowledge gaps are. And again, we're offering this free for whoever would like to try this and just get a feel for, where are our gaps? Where do we need to focus? What are the roles that are struggling the most?

It's one thing to have those opinions like you all shared in the first poll, it's another to actually measure it and be able to say, "Yeah, we have a gap in people being able to distinguish signal from noise." And, understanding the concepts around over and under reacting to data when it's actually signal and there's a problem, versus when it's just random noise in the data. So, things like

that are built into this spot-check. We're super excited to offer this for free. We really want people to understand where their organization is and what areas to focus on.

Bob Burgin: And then finally ... Tom, thank you again for sponsoring this. Most of our training prior to UC Health building the EHR training ... And I will comment for those of you on Cerner. With UC Health's guidance, MedStar in DC is currently building the equivalent training for Cerner, and that'll be ready in mid January. So, the ROI analysis can be for Cerner or Epic. But most of our training prior to that was clinical as you saw in the demo with CLABSI, and CAUTI, and sepsis and et cetera. So we've taken some of our highest risk courseware in the clinical setting from our quality and safety essentials library, and used that point-biserial analysis to develop about a 25-minute clinical literacy spot-check that would allow you to take a sample of your nurses or doctors, run them through 20 or 25-minute spot-check analysis and get some data back around some clinical errors.

Again, Tom, I know this is not a small lift and appreciate very much Health Catalyst sponsoring this. And with that, Brooke, I'll turn it back to you to see if people want to weigh in on any of these, if they'd like the Health Catalyst team to follow up with.

Brooke MacCourtney: Yeah, great. Thanks, Bob. As we mentioned, Health Catalyst and Amplifire have partnered together to offer these free assessments in the following categories. I'm go ahead and launch this poll. If you just want to let us know which of these assessments your organization is interested in, your options are analytics and improvement literacy, competency gap assessment, ROI analysis on Epic classroom training replacement, or clinical competency gap assessment. We'll just give you a few seconds to answer that. We appreciate you answering our poll questions today, and we'll be jumping into the Q&A session in just a minute. If you have any questions for any of our presenters, now would be a good time to enter that into the questions pane in the GoToWebinar control panel. We'll give everyone a few more seconds to answer this question.

And as we mentioned, we will reach out. Anyone that's expressed interest in any of these different assessments, we will reach out to you following the webinar and make sure that we get you in touch with the right people to proceed with that. All right, looks like our votes have stopped coming in so I'll go ahead and close that poll. And, if you want to go to the next slide. This is our final poll question for the day, so we appreciate you sticking with us. We'll go ahead and launch this. So, while today's webinar was mainly focused on basically our clinical training and transforming learning in the clinical setting, some of you might want to learn more about Amplifire or Health Catalyst's other products and professional services. If you'd like to learn more, please answer yes to this poll question and we will follow up with you. Give you a few more seconds to answer that. A couple more seconds.

It looks like votes are stopping so I'll go ahead and close that poll. All right, and then we'll go into our Q&A session. We've had some great questions come in, and so please if you have a question, go ahead and put it in the questions pane and we'll just go ahead and get started. Our first question comes from Jean. She asked, "Is this training just knowledge based, in other words, asking questions, as opposed to having the learner do something?" I don't know who wants to answer that one. Tom, or Bob?

Bob Burgin: The questions take a lot of different structures. The clinical training tends to be heavy with interactives, setting up a scenario with a patient and then the learning is shorter, whereas the EHR training tends to be the opposite. A really short question, and then a deep interactive where you literally click through and do the tasks that we're trying to teach you in a screen captured mock up, if you will, of what the screens look like. The do something tends to be digging into an interactive about a question on clinical and digging into actual steps in Epic on the EHR training.

Tom Burton: Yeah, and we've used it as well, for example, in some of the analytics engineering training. We've actually had links that pop you out to a website where you need to look up an ICD-10 code or something like that in order to figure out what's the right code to put in a SQL statement, for example. So, it's fairly flexible in the types of questions you can design. We're also building ... There are certain things where you need to observe someone. For example, we might teach the principles around presenting data in a compelling way. We might teach some of those principles in an Amplifire module, but then to actually test it, we're going to actually physically observe someone presenting a dashboard or a run chart and actually have an expert evaluate them. So we use a hybrid approach, leveraging Amplifire for that knowledge delivery. And then in some cases where the competency is a more complex competency, we may actually have a live coaching interaction or testing interaction that's in addition to the Amplifire knowledge delivery portion. Does that answer the question?

Brooke MacCourtney: I think so. Jean just wrote in and said, "Great, thank you. That is what I was hoping you'd say," so I think we got it.

Tom Burton: Excellent.

Brooke MacCourtney: Okay. Next question comes from Raymond. The question is, "This is very similar, or essentially problem based learning from McMaster, but leveraging automation for efficiency. I like and believe in it. Why then do the myriad of accreditation and validation organizations still use a memorization based evaluation methodology?"

Tom Burton: I'll let you take this one.

Bob Burgin: Yeah. I will tell you that we do a lot of training in a lot of industries. We trained 80% of the lawyers for six years in the United States for the bar exam. We do a lot of high stakes test prep with the Computer Technology Industry Association. We spoke with the boards by way of example for clinical boards, and there was an RFP, and I just have to say this out loud. We were number one, and there was a second assessment platform. They eventually decided not to use us because their mandate was not to teach, it was only to assess and our platform was doing the gap analysis, like Health Catalyst is sponsoring for free and driving people right in the platform to the training they needed to fill in for that board study and the Board Association rejected it because they thought it reached beyond their mandate.

We've dealt with accounting boards looking at seat based credentialing to keep your CPA license and I have found those kinds of organizations to be very difficult to move. Whereas working with health systems that have a clinical and financial problem, I've found it to be very easy to make that transition. So, we don't spend a lot of time banging our heads against that wall.

Tom Burton: That's a great question.

Brooke MacCourtney: Perfect, yup. Looks like Raymond's response said, "Thanks. A loss for trainees."

Bob Burgin: Indeed.

Brooke MacCourtney: There we go. Okay, next question. Actually, I'm going to jump to this one since you just touched on that Baba. Max asks, "Has Amplifire been used for other industries? Can it be?"

Bob Burgin: Yeah, yeah. We trained about 1.7 million people last year and the healthcare division is our largest division, but we do corporate training. We're the largest trainer of medivac helicopter pilots In the United States. We do training with airlines, we do training with call centers, and we do college course training around certain specialties so it's highly diversified. What you see here is that all the courseware is built with partners on the front line. Health Catalyst built all the data analysts training, UC Health built the Epic training, MedStar is building Cerner, Brent and his team built CLABSI. Our model is to put the tool in the hands of the experts, and then help them deploy it in a way that makes a difference.

Tom Burton: Yeah, just add to that, Bob. It's really a combination of a learning engineer that understands question design and shadow questions and learning experience techniques, combined with a subject matter expert that's passionate about improving how people learn, and really deeply knowledgeable about the subject area. When you get those two combined together and then give them an incredible platform like Amplifire, that's where we just see really incredible

results and super excited about doing more and more of this kind of education throughout all of our learning.

We're in the process ... We have a an advanced practices course patterned after Brent's course that we do for improvement teams. We're in the process of converting that to a hybrid approach, leveraging more Amplifire for knowledge delivery, but still having some of the interactive games we've done and some of the interactive discussion groups. We think that hybrid approach is actually going to be the best combination learning, especially for more complex competencies, but we've been missing that. That missing piece of doing the education at scale is now available through our partnership with Amplifire. We couldn't be more excited about it.

Brooke MacCourtney: Great. Okay, next question comes from Julie. She says, "US Health set up their own Amplifire testing. If other organizations would like to utilize Amplifire, do they need to create the content?"

Bob Burgin: Yeah, thank you so much for that question. I realized we didn't put that in the deck. Amplifire does the customization to your instance of Epic. Part of the relationship is that we can come in ... [Reece 00:58:45] leads the team who built it at UC Health. We built it under Steve's and CT's leadership with this need to customize in mind, so the back end storage of all these screens is incredibly thoughtfully designed. We can generally do a full customization in about 75 days to your screens. Each role is about five hours of total time from a subject matter expert between reviewing the content, figuring out where the screen workflows have such different, capturing those images and send it to our team, we build it, sending it back to that subject matter expert to make sure we got it right, but we run that entire process for you.

Brooke MacCourtney: Great. Next question. I think it's very similar, but maybe we can just touch on a couple more things. Andrew asks, "Considering ROI, how much did it cost UC Health to build the content in Amplifire? How many hours of UC Health effort? How much did Amplifire charge as they're part of this engagement?"

Bob Burgin: I will tell you that the amount of time it took to build this from scratch was a lot. It took us three months to build the first module and three months to build all the rest of them once we really figured it out. But now, they're used out of the box with simple customization done by Amplifire. I haven't sat and calculated the amount of time from UC Health, but it was a lot. They were incredible in building this. But a new health system using it, it's 75 days from decision to go, to ready to launch. Most of the heavy lifting is done on our end since we have developed all that expertise working with UC Health.

Steve Hess: Hey Bob, it's Steve. If I can add on to that. One of the things that we've done here is obviously as we moved from classroom to Amplifire, we take a lot of our instructional designers. These are existing people that develop training

materials and content for the classroom, and actually train them up on the Amplifire tool. So, they are now able to build some of this content with Lori's help and so on, so we've really repurposed a lot of the existing folks with some additional training themselves to be able to take this into the future. So, just one other thing just to add. From a UC Health perspective, extremely focused on three parallel work-streams now.

One is, continue to make the onboarding Amplifire content better and continue to learn from it, link it back to the actual EHR usage. We are taking the clinical world and starting to put the lens of the rev cycle world on top of it. So think front end registration and scheduling, and then back end rev cycle, so there's a play there as well. But then as Dr. Lin mentioned in his deck, the reality is training is not a one-time event for onboarding. Like many of you, you're probably upgrading your EHRs now every three months on a very recurring, the screens change, the workflows change and so on. So, we're really focusing on capturing that optimization workflow with these tools as well. And then again, having those very directed personalized, individualized interventions where the clinicians and/or front end, back end folks are struggling so that we can continue to move that needle with how folks are competent and efficient within the EHR.

Bob Burgin: Yeah. Cleveland Clinic and UC Health have stepped in to develop now a rev cycle management that should be available in Q1, so we're excited about that as well.

Brooke MacCourtney: Perfect. Okay, we are a couple minutes over the top of the hour. We'll keep going and answer as many questions as we can. If you need to drop off, we are recording this and you'll be able to access this later. Next question comes from MQ, "How can you provide personalized training for a large number of learners at the same time? Does it require more capacities or longer training time?"

Bob Burgin: No. We load the courseware into your LMS and you assign it. It pushes the learner to the cloud and the training time compared to traditional methodologies is somewhere between 50 and 85% less. There is a cognitive load if you're doing EHR training, and clinical training, and compliance training. Most of the health systems we work with develop a cadence of rolling out, "We're going to take on CLABSI across the system," or at a few hospitals where there's a problem, "We're going to take on sepsis six weeks later." I will tell you that one of the things I'm incredibly excited about is the partnership with Health Catalyst, and Tom, you probably can speak to this better than I, but that allows us to be predictive. In other words, look at the data in Health Catalyst and have a very pointed deployment of clinical training. You want to comment on that, and your work there?

Tom Burton: Yeah. For those on the webinar that are Catalyst customers, you are very aware that we have many, what we call analytic accelerators that will help in a particular area like sepsis, for example. So we're measuring things like, how

quickly are you doing the three-hour bundle? Inside the three-hour bundle, how fast are you getting antibiotics and fluids on board, and things like that? So we have those analytics. Now what we're really excited about is, we're starting to experiment with connecting the clinical process and outcome data that's in various EMR and other departmental systems and cost systems, taking that data and combining it with when we see a process failure, looking at education through Amplifire as an intervention.

For example, if we see, "Wow, someone's really not getting this part of the process," we can instantly send a little packet of education that helps that team or that unit improve that particular part of the process. Whether it's EHR education, whether it's the clinical thought process of how to manage sepsis, or CLABSI, or CAUTI, but we can target that based on what we're seeing in the actual care delivery data, the actual outcome data and so we're very excited. That's the next thing we're working on, is the integration of the operational and clinical data with the education data, and having that bidirectional inform and really be targeting education, and pinpointing the gaps that are seen from the outcomes and from the process failures. So, super excited about that. That's coming in 2021.

Bob Burgin: And to the degree that the question is saying, at our health system do we have to put new infrastructure in place, the answer is no. It works through your existing LMS and it is completely cloud based, so the deployment does not require new infrastructure for the training.

Brooke MacCourtney: Great. Okay, a couple more questions. Jen asks, she's curious to know about how Amplifire content specific to Epic is managed with respect to regular more frequent upgrades, and version-specific functionality?

Bob Burgin: What happens when you deploy the Epic training, is you free up a whole lot of resources. Instead of needing 30, or 70 or however many classroom trainers, you might need 10 or 15% of those classroom trainers, or 30% of those classroom trainers. And instead of needing a large team of instructional designers building content for classroom training, you take this right out of the box and we customize it your deployment. What we recommend is that ... UC Health is doing the upgrades as they view necessary on a quarterly basis, but we recommend that each health system keep a small team that can review the quarterly updates and make decisions about what to build.

We can train and certify that team of instructional designers to be Amplifire authors so they can be independent and do that work on their own, or you can contract with Amplifire, tell us what you want us to build and we'll build it. But generally, you'll see several million dollars of cost reduction, and we recommend you keep a little bit of that for these quarterly updates. But it doesn't take much, only a few people, a little bit of time once a quarter to do those updates.

Brooke MacCourtney: Perfect. Okay-

CT Lin: This is CT. I'll add that even with quarterly updates from Epic which we were concerned about, the actual screen changes are typically pretty minimal. The vast majority workloads will not change with each quarterly update and so the delta every quarter is not big. It's a small number.

Brooke MacCourtney: Great, CT. And CT, these next questions are for you. They're from Beckett. He says, "Any correlation data yet with Signal or Arch data yet? Are you using this for annual training yet or just initial?"

CT Lin: Thanks for that. In terms of correlation with Signal, we are showing the increased proficiency in the data. It's too early yet for us to show much in terms of efficiency over time. The more important thing though, is our modules that we're anticipating building for optimization, and that's what I think you're talking about annual refresher training. We're very excited that with the content we've built from our Sprint team refresher training optimization, we've been able to show in some practices a 15-minute ... Now, this is before Amplifire. This is data that we gathered from our Sprint teams before and after our Sprint teams go into this two-week intensive. We did not talk about it today in much detail. We've been able to show that our practitioners are saving 15 minutes per doctor, per day in the electronic health record as a result of Sprint content training and we're hoping to translate much of that content into Amplifire friendly work so that we can do that on an annual basis.

Brooke MacCourtney: Great. It looks like he had one more follow up question. Are using it yet on other IT systems, speech recognition, EHR dashboard reports, Haiku/Canto, or secure text?

CT Lin: Not yet on those specific items but as I think was referenced earlier, we are branching out into other roles, our nursing roles, our other clinical roles and revenue cycle, and so forth. We see really no limit for Amplifire training expansion.

Brooke MacCourtney: Great. Okay, last question. I think this one's a little bit tongue-in-cheek but it says, if someone has a requirement to do eight hours of continuing education and they do it in 1.5, are people saying, "Hey, I want my eight hours." I don't know if anyone wants to answer that. I think it's a little bit of a joke, but thanks, Andrew, for that.

Bob Burgin: I can tell you that for our CEU and CME in our clinical courseware, we've been successful at getting one hour, excuse me, one hour CEUs and CMEs when we can show that people who needed the training comprehensively took 58 minutes, even if some people could do it in nine. So, we've been able to hold the CEUs and CMEs on the clinical side.

Tom Burton: Yeah, it's a really interesting dilemma because some of the regulatory requirements are hour based. Some of the regulations are this many hours of CME or this many hours of this. It just goes to show you how backwards it is. We should not be measuring the number of hours sitting in a classroom or sitting in training, we should be measuring, did someone actually certify on the competency? Do they know this stuff? Can they apply it? So, we're actually working with ... We actually had this come up on some HIPAA training where we think we can make it much shorter, but some of our business associate agreements actually have language of certifying that you've done a certain number of hours per year.

So we're changing that in the language of our contracts to match that we actually have past certifications of understanding and competency rather than a certain number of hours, which I think is much better for the learner, and much better for the organization because you're not wasting time sitting through. And we all know what really happens is people just ... What Bob calls it is stapler training. You put your stapler on the mouse and let it just go through the training while you're doing something else and then you pop in and answer the questions at the end, and you're not really learning anything in those situations. I think this competency base is so much better than seat time, and we need to shift our thinking as we're certifying people away from tracking number of hours to really tracking mastery, which is what Amplifire helps us do so well.