Transcript

So, we like to see if we're teaching what we think we're Teaching. So, we're starting with a pre-test and ending with a post-test. This is also a nice way to assess your own knowledge of Today's topic and what you might be listening for as we go along. So, I'll ask Brittney to launch our poll with our pre-test questions, the questions are also on this slide and on the 4th page of your handout if you would prefer to follow along There. Thanks, Brittney. So please take a few moments to record your answers and then we Will review this together at the end of class. OK. I'll ask Brittney to go ahead and close our poll, and we can just review our results for a moment. So, it looks like we had a lot of responses. Thank you for participating in that. And it's interesting to see kind of the spread of answers. So, all of these answers will be revealed as we go along today, and then we'll take this again at the end of class.

All right, here is our complete agenda for today. So, we just finished our pretest. So next we'll talk about what happens when MeSH is updated and how you find out about those updates. We'll discuss different examples of MeSH changes from the PubMed searchers' perspective, and then we'll finish with our post-test. Again, I'll stop to address questions throughout the Session, so please drop those in chat as we go and make sure You're sending them to everyone so that we can all see the Questions that are coming in.

Every year, the medical subject headings or MeSH that are used to index MEDLINE citations and PubMed are updated. Terms may be added, changed, or deleted to reflect changes in the biomedical literature. These changes take place at the end of the calendar year to Start the new year off right with some better language for Search and retrieval. Today, we'll review 3 common MeSH changes that can affect your PubMed searches, and these are a new term with the same meaning, A new term that is more specific, and hierarchy changes. These don't encompass all of the different MeSH changes but rather the ones that could impact PubMed searches going Forward.

Changes to MeSH are documented in multiple places, including on The MeSH homepage and in the NLM Technical Bulletin. I'm now going to open up PubMed to show you how to get to the MeSH homepage from there, and we'll also review the Technical Bulletin article together. If you'd like, you can follow along in PubMed in a second Window. This class will be very hands on with lots of searches and Exercises, so it's great if you can follow along on your own. If you only have one screen, then another option is to run the Searches in PubMed and the MeSH database using another device, Like your phone or an iPad. And Brittney will put the link to

PubMed in the chat now so that it's handy for us. And I'm going to open up PubMed. So, when you're ready, and you've got PubMed ready to go, please use that Reactions button to give me a thumbs up, and that'll Let me know that we can move along. Thank you. I'm seeing lots of thumbs. Excellent.

All right, so let me show you how to get to the MeSH pages From PubMed. Under the Explore menu, select MeSH Database. And from there select the NLM MeSH homepage link. On this page I want to draw your attention to the What's New link Under Recent MeSH Updates in December each year. MeSH staff will post the complete changes for the Upcoming year at this link, so I'll click on it to go there. Now starting with 2024 MeSH, the NLM is posting recent MeSH Developments year-round on this What's New page. This meant that during 2023 potential new or revised terms For MeSH 2024 were available to view here, so it's kind of like A sneak peek. So, at the top of this page, we see the new MeSH descriptors That are in progress for 2025, and below that list is a link to A special in-progress project of new concepts and terms related to a topic we're all familiar with these days, Artificial Intelligence and machine learning for 2025 MeSH.

So, this brings us to the first question in your handout. MeSH staff post recent MeSH developments year-round on the What's New page on the MeSH homepage. But today, we want to look below these 2025 updates to see the Ones for 2024, and you can view 3 lists here: New MeSH Descriptors for 2024, MeSH descriptors changed for 2024, And New Concepts and terms Related to Psychological Stress For 2024. For a detailed view of all MeSH 2024 updates, you can visit the NLM Data Discovery Catalog, and I've put a direct link to that on your handout so you can take a look after class. Now, As I mentioned before, we also announced these changes in the NLM Technical Bulletin in November and December, and That's the answer to #2 on your handout. Documentation and guidance on MeSH changes in MEDLINE can be found in the NLM Technical Bulletin, so I'm going to open up the NLM Technical Bulletin announcement now so we can take a look at it. If you don't already receive the Technical Bulletin announcements Via e-mail or RSS, being alerted to MeSH updates is a good reason to sign up. There's a link to sign up on your handout, so you can do that later.

This year, we updated MEDLINE to reflect changes to MeSH on December 15th, and this annual MeSH Processing for 2024 MeSH article Published every year, walks you through changes to the database That might affect your searching. We've also hosted, for the last seven years, a webinar highlighting important changes to MeSH. This year's was on January 10th, so when the recording is Available there will be an alert from the NLM Technical Bulletin, which is another

great reason to sign up, and that's how you can Find out about MeSH changes each year. Next, I need to quickly review some PubMed basics. So, let's start by looking at an example of a saved search in PubMed. So, I'm just going to navigate back to PubMed and if you have a saved search of your own, feel free to take a look at it and follow along in your own account if you would like.

So, I'll go to my NCBI account and take a look at my saved Searches. So, here's a typical saved search titled Long COVID Migraine. To review it, I'm going to run it in PubMed. By clicking on the name here I have my results. If you've attended PubMed training in the past, you know That there are two things I need to check to understand what PubMed is doing with my search, my term mapping and my MeSH Automatic explosions. And that's the answer to #3 on your handout. Check your saved PubMed searches for MeSH term mapping and Automatic explosions first. I'll take a look at my search details by going to the advanced Search page. Scroll down here and open up my search details.

All biomedical terms should be mapping to MeSH. If I have any that are not mapping, I need to find better Terms for my best PubMed results here. I do have mapping for both of my biomedical concepts. Long COVID maps to the MeSH term post-acute COVID-19 syndrome and Migraine maps to the MeSH term migraine disorders. It is possible that these maps may change from year to year with changes to MeSH. If it's important to you to know what those changes were each Year, you should consider documenting these term mappings as shown on the screen. you could copy and paste this, or You can use the handy download feature. The second thing I'll check are my explosions. I'll use the MeSH database to determine what narrower terms Are automatically being searched through this mapping. So please open up the MeSH database and you can get to MeSH Any time from PubMed from the link at the bottom of the PubMed Screen. So we'll go to MeSH, and once you're in MeSH, tell me in the Chat how many additional MeSH terms are added when my search Maps to migraine disorders. So how many additional MeSH terms are added when my search Maps to migraine disorders? Let me know the answer to that in the chat when you've got it.

All right, I'm seeing lots and lots of fours. Yes, we are looking for the number four as our answer. Let's review how to find that together. So, I'm in MeSH, and I'm going to search for the term migraine Disorders. Here we have the MeSH record for it, and if I Scroll down to the Hierarchy at the bottom of this record, here are the narrower Terms that are automatically included in my search, and this Tree may change over time. Right now, there are 4 narrower terms, which is also the answer to #4 on your handout. So again, if this is important for you for any particular Search, consider documenting your explosions as well, because They could also

change from year to year. If you regularly check your explosions in PubMed, give me another thumbs up. If that is something that you regularly do as part of your Search, yeah, seeing lots of thumbs again, which is great. If you're only looking for a few good articles, then checking your explosions might not be necessary. But if you're doing a systematic review, you should check your Explosions for each term and every year so that you know exactly what you're searching.

Let's take a moment to explore something else interesting about Migraine disorders. I'm going to scroll back up to the top of this MeSH record. This is one of the most common questions that we get about MeSH. Why are there two dates for the year introduced? The first year introduced is included in a MeSH record when the term was added sometime after the debut of MEDLINE in 1963. If you do not see a year introduced, you can use the term for searching the entire database of index PubMed Records. If you do see a year introduced, you should consider how to Search records that were indexed prior to that year, and we're Going to talk about that a lot today. So, on this record, besides the year introduced, you see 2006 (1963) When two dates are listed. For the year introduced, you can use the term to search the concept Back to the oldest date listed. This is on your handout as question #5, and it's really important, so I'm going to repeat it. When two dates are listed for the year introduced, you can use the Term to search the concept back to the oldest date listed. This means that you can use the term migraine disorders to Search for this concept back through 1963. This concept has been in MeSH since 1963, but the preferred Term became migraine disorders in 2006. In other words, the idea or the topic of migraines has been in MeSH since 1963. But in 2006, the term that represents the concept in MeSH Was updated, and there's a variety of reasons that this Might happen. Maybe MeSH staff decided that there was a better name for a Concept, and we'll talk about that in a minute. Maybe it was a supplementary concept record for a while, but the important thing is that you can use this term for searching Back to the oldest date listed here.

To help you remember how Two dates in MeSH work, this graphic illustrates it. If a MeSH term has two dates listed beside the year introduced, you can use that term to retrieve or fetch citations Indexed as early as the oldest date listed. Your handout also includes a link to a video that reviews Dates and MeSH if you want to take a look at that later.

I want to pause here and emphasize the difference between the year a citation is published and the year it's indexed. And here's another illustration to help you remember this. The publication year may be different than the year indexed. For example, MEDLINE may receive journal issues published in 1918, 1948, or 1988 this year. The articles in every issue indexed this year, regardless of When they were published, will be indexed with 2024 MeSH. So, you can use the

year introduced to search for Publications indexed back to the oldest year listed. And to limit by publication date you can use the filters in PubMed. OK, so it's time for a little quiz to help us review this, and You will need the MeSH database to find the answer. Remember that you can access MeSH from a link at the bottom Of PubMed. You can also record this on your handout if you'd like. It's quiz #1.

So, my question is, how far back can you search with the MeSH Term Mpox (monkeypox)? When you've got it, put your answer in the chat, and then we'll review it together. Wonderful. So yes, we are all getting it. It looks like the answer here is 2004 or choice C. Let's take a Look at how to find this in the MeSH database. So, I'm going to open MeSH backup, and I'll search for our Term Mpox (monkeypox). Here's my term, so I'll click on that to see it. And beside year introduced, I see two dates. You can search this concept using this term: Mpox (monkeypox). Back to the earliest date listed, which is 2004, and the Later date, 2023, tells you that something else changed in the Record, probably the preferred term.

OK, let's do one more quiz about this just to make sure we're Really getting it. So, this time, tell me how far back you can search with the MeSH term coping skills. This is quiz 2 on your handout. Excellent. So yes, the answer here is 1992 or choice B. Great job. Thank you so much for your responses in the chat. Let's also review this in MeSH as well. So, I'm going to open up MeSH, and this time, I'll search for my Terms coping skills. Here's my term beside year introduced, I see that the oldest date listed is 1992. So that's our answer. You can search this concept using the term coping skills Back to 1992.

All right, this is a good time to pause for some questions. Kate, do we have any questions we can answer at this point? Well, most of the questions that have come up so far are administrative questions, which I've answered in chat.

There was 1 substantive question early on about, oh, and there's one more coming in about how much this course relates to **how you might search in a different system that has MEDLINE and PubMed records like Ovid or ProQuest**. I'm afraid we can't really answer that question because we're not experts in other systems. We're focusing on PubMed today. All I can say is that those other systems, if they are using MEDLINE and PubMed records or getting them from us when we update our PubMed records, they're downloading those new records as well. But for the details of how it works in their systems and how they implement MeSH, I'm afraid you have to go to that third-party System and find out from them. Sorry, I can't be more helpful there. OK. So, a bunch of new questions are coming in.

So, **Elizabeth asks, what if some of the MeSH terms don't? Oh, what about MeSH terms that don't have year introduced? How old are those terms? Catherine, would you like to take that one?** Absolutely. So, if you don't see year introduced, that means that you Can use it to search all of PubMed. So basically, back to 1963 when MeSH was introduced. So, I think one of your peers also put that in chat, which is Great. Thank you. Good question.

I see another question here from Karen that doesn't directly relate to what we're talking about, but if we have time in the end, let me take a closer look at what you're asking, and we'll try to address that at the end. And then I have another question that really just is about what we're about to discuss. So, we have some questions about previous indexing and what we do, about earlier years. So, we're about to get into that and let me just see if we can do one more really quick.

How long does it take for MeSH terms to be applied? I believe the latest I heard from the indexing staff is that it's now taking less than 24 hours for the MeSH to be applied to new records in PubMed. All right. So, keep those questions coming. I'm going to keep an eye on them, and we'll get back to more Questions after the next section. Thanks. Thanks, Kate, and thank you everyone for your questions.

Yes, so let's now talk about some categories of MeSH changes from the context of a PubMed searcher. So, the first type of change is when a term is updated but carries the same or similar meaning to an existing concept. In other words, the concept still appears in the literature, but different terms are now being used to describe it. So, this is like our migraine disorders example from earlier. So, let's take a look at a different example in MeSH. I'm going to open up the MeSH database and search for influenzavirus c . So, influenzavirus c. There we go. I'll search for this. I got 2 results including a MeSH term and a supplementary Concept. I want the MeSH term, so I'll click on it. gammeinfluenzavirus, and here's my MeSH record. Note that the earliest date listed is 1986, but the term was Updated in 2024 from influenzavirus c to gammainfluenzavirus. Therefore, this is the renaming of one term to another that Represents the same or similar concept. This type of change is because MeSH or another terminology body Decides that there is a better term for something. So maybe it's a little more precise or more widely accepted, or it reflects the way our language has evolved. So, let's use the PubMed Search builder to search for this term and see what kind of results we get. So, I'm going to click on my Add to Search Builder button and There's our search string. I do want to note here that I'm not recommending any particular Search strategies in my examples today. I'm not demonstrating real

research questions. I haven't done a reference interview. I am using example searches to illustrate what kind of Retrieval is included when you use or map to MeSH in your Searches. OK, so now I will click search PubMed. Here are our results and notice these results by year graph. Keep in mind that this graph shows publication date not Indexing date.

So, you can see when we started using this concept for indexing in 1986 and we can see some articles from older years that we received and indexed after 1986. So now I'm going to try to search for my old term in PubMed, influenzavirus C, and I'll tag it with MeSH. So, I'll go up here to my search box Influenzavirus C tagged with MeSH, and let's see what we get with our old term. I'm going to check my search details to see what my mappings Look like. So, I'll open my search details, and you can see here that the old term is mapped to the new term. This is because the old term is an entry term for the new Term. So, your old search should work just fine. The specific term may have changed this year, but when there's a one-to-one relationship between the new Term and the old term, the NLM does a find and replace in the Database for the old term, and you can use the new term for Searching right away. You might consider switching to the updated term, but an Adjustment isn't usually necessary and there is a list of MeSH preferred term changes like this for 2024 on the What's New and MeSH page that we looked at earlier.

So that's our first type of MeSH change, a simple replacement of 1 synonymous term for another. To summarize, when MeSH renames a concept, the existing PubMed records are changed, and the old term is added as an Entry term. So usually, you need to do nothing. You could consider adding the new term to your searches and This is number six on your handout. So, I'll repeat it. When MeSH decides to rename a concept, or in other words, change a preferred term, usually, you need to do nothing.

All right, so let's practice this together. Go quiz #3 here on your handouts. Which MeSH term does the search for Russell's Viper map to? And once you've got it, tell me in the chat. And that's a picture of a Russell's Viper if anyone was really curious. Kate, I'm with you on not loving the snake. Great. All right. Thank you all so much for your answers. Yes, I think we all got it. Our answer is Daboia. So, this term replaced Russell's Viper this year. Let's go to PubMed to review. So, I'll open up PubMed, back to PubMed, and I'll search for Russell's Viper, and here are my search results. I'm going to go check out my search details on the Advanced Search page. Open those up and I can see here that Russell's Viper is mapped To the MeSH term Daboia, and it maps because Russell's Viper Became an entry term for Daboia. Wonderful. All right, we are actually going to pause again for questions in case any more have come in. Kate, are there questions that we can address?

One question that came in was a question about **why there isn't a MeSH term for something, even though it's an old concept.** We're probably not the right folks to ask that question of; you probably want to talk to MeSH staff directly. But the short answer is that there are minimum qualifications for them to consider a term for MeSH. Including that, there's a significant body of literature surrounding the term with exceptions. So, I mean, for any specific term that you think should be in MeSH, I would definitely send in a MeSH request, and let me dig up the link to the website where you can learn how to submit a MeSH suggestion. OK, so let me see what else is going on in chat.

OK, **how many MeSH terms are there?** Oh, is it about 30,000? Now I might have to look that one up too.

If your search included MeSH term tags, would you need to make a change? No. OK, so Melissa, if you use what is now an entry term but tag it, it will still work, so you wouldn't necessarily have to make a change. A good general question here for best searches is 1 search both MeSH terms and keywords. That is our general guidance that you do need to search with MeSH and other terms because not every record in PubMed is indexed, only the MEDLINE records are. So, it's always a good idea to supplement a MeSH search with a Keyword search.

Elizabeth asks **do you have goals of how many MeSH terms to create from SPC?** Sorry, I don't know if I'm just slow this afternoon, but what is SPC? Oh, supplementary concepts, not that I'm aware of. I don't believe that the MeSH staff have specific goals about how many terms they're going to convert from a Supplementary concept to MeSH in any given year. I think it's more about usage.

And Iris, your question will be very much welcomed during our NLM Office Hours in February when we're going to be talking specifically about automated indexing. So please sign up for the NLM Office Hours, I'll dig up the link for that as well. All right. I think we better move on, but I'm going to keep the questions coming, and I'll go back and see if I missed any. Thank you.

Wonderful. Thanks. Kate. I'm also curious how many MeSH terms there are because I don't know; it's a lot. All right let's move on to our second type of change, which is When a term is added to gain specificity. This is the most common type of change to MeSH. So, for example, this year, we added multiple new terms related to psychological stress like time pressure, subjective stress, symptom burden, and emotional exhaustion. We also added some terms related

to food and eating, like diet, Plant-based, dietary patterns, and meat substitutes. So, let's go to MeSH and search for a term that was added this Year. So, I'm going to open up MeSH, and I'll give everyone a chance to get there, too. And once I'm in MeSH, I'm going to search for the term Cardio-Oncology, Cardio-Oncology, and here's our term. So cardio oncology is a new term this year. If you're looking for relevant literature, it can only be used to search indexed records from 2024 forward. So, let's run a search for this term in PubMed and see what we Have so far. So, I'll add it to our search builder, and then I'll search PubMed.

As you can see, there's not much here yet, just six results. A quick look at our results by year graph shows the Limitation of this search. So how do we include literature about this topic indexed before 2024 in our search? And I think some of you were asking about that in the chat. So, we're going to talk about that in this section. It's how we find literature about this topic indexed before 2024. So, let's go back to our MeSH database record and see if there Are some clues that will help us. So, I'm going to click back to the cardio-oncology MeSH record. And looking at this record, if I Scroll down, I see a hint Provided under the previous indexing section. So, previous indexing will tell us which term or terms, either individually or in coordination, were used to index this concept Prior to the addition of the new term. Depending on your topic, you'll want to consider which Combination of previous indexing terms makes sense for your Search. Cardio-oncology only has one previous indexing term. We'll see an example later that has more than one. But in this case, medical oncology can be used to search for literature on this topic indexed between 2010 and 2023.

So, to search comprehensively back to 2010, I would want to Search using the new MeSH term without any date restrictions. And then I'd want to think about how to search using the previous Indexing terms for records indexed prior to that date. So let me show you what I would search for. I'm going to copy and paste the search string into our PubMed Search builder and then we'll talk through it. We go and I'm going to make the screen bigger and adjust it so We can all see that I hope very well. So, this is what we would search for. Cardio oncology tagged as MeSH or (Medical Oncology) tagged as MeSH and 2010: 2023 tagged with mhda. So, remember that I told you that date indexed is distinct from the publication date. This is the indexing date and it is searchable using the search tag mhda. So here I'm searching for all records indexed between 2010 and 2023 that include the MeSH term medical oncology. And we're going to go over this a lot today.

OK, let's look for another term. I'm going to make my screen back to its normal size. Let's search for another new term. This time we'll look for emergency room visits, emergency Room visits in

MeSH. Here's our term. Note that our year introduced is 2024, so I'm going to run a Search for this in PubMed to see what we can find. I'll add it to my PubMed search builder and search, and I get 31 results, not as many as we might think would be on this topic. So, like before to find earlier literature on this concept that Was indexed prior to 2024, I need to review my MeSH record. So, I'm going to go back to MeSH, and I'll scroll down to look for Previous indexing, which I would expect to see here above the hierarchy. But I don't see any previous indexing which is typical for these newer, narrower terms. So, what should I do? That's my question for you. What should I do next if I don't see any previous indexing but want to search for articles indexed before this year? Let me know what you think I should do in the chat. I bet we've got some PubMed searchers here who may have an idea of what we should do next.

OK, great. Yeah. So, a couple of us here have given some good ideas. Thank you all. So, if you're thinking that we should search with the next broader terms in the hierarchy, that's what we're going to Suggest that you do. So, if we see no previous indexing, then we simply check the next broader term or terms in the hierarchy. And that's because if no single specific terms exist in MeSH for Concept, MEDLINE indexing uses the closest more general concept Available. So, I see three broader terms for emergency room visits, which Many of you pointed out. We've got 3 broader terms and those are emergency medical Services, patient care, and facilities and services Utilization. You would want to consider which broader term, or a combination of those terms makes the most sense for your topic. I'm going to click on Emergency Medical Services so that we can Take a look at its MeSH record. So here we have Emergency Medical Services, and I can use It back to 1980. So, let's add it to our search builder and see what we find in PubMed. So, with our new term, we found very few results, but with this one, we got over 170,000 with our broader term.

All right, so to Review this, this is the second type of MeSH change, a new term That adds specificity. So how do you adjust your searches for this kind of Change? For this type of term, existing records are not changed. You may want to use the new, more specific term for your Searches of new records. So, think about what you want to retrieve and for what dates. If you want records indexed earlier, consider your options Using the broader term and or previous indexing information. To search for previous years. Consider what combination of terms might be appropriate using the dates on the MeSH records to determine what years of indexing to search each term with the mhda search tag. And this is on your handout as question #7. So, when a new term is more specific, use the new term. For newly indexed records, use previous indexing and or the Broader term with the MHDA search tag to search previously indexed records. OK, let's do an exercise to walk through this. We're actually going to do a couple of exercises on this

topic as we go along today. So, you can follow along on your handout with exercise #1 if you would like.

Our first question is how far back can I search with the MeSH term Tibiofemoral Joint? Let me know in the chat when you've got the answer to that. Are you getting lots of answers? Excellent. Yep, just this year, 2024 is our answer for this one. In MeSH, the year introduced is 2024. We're getting really good at identifying that, which is great.

OK, so my next question is where do I look in the MeSH record for Terms used prior to 2024? So let me know what you think. Where should I look in the MeSH record? Yep, looks like we're all getting it. So, our answer this time is previous indexing, which some of You pointed out is usually located below the list of entry Terms. That is where you want to typically look in the record. So yes, this answer is previous indexing. In this case, there is one previous indexing term which is Knee joint, and it was used from 1986 to 2023.

OK, and our last question in this exercise is what field tag do I use to limit to records indexed between 2005 and 2023? What am I going to tag those dates with in my search string? Excellent. Yes. So, our answer here is the mhda tag, which stands for MeSH date. You can see on the screen here an example of what that search might look like using the mhda tag. So, we might search tibiofemoral joint tagged as MeSH or parentheses, knee joint tagged as MeSH and 2005: 2023 tagged with the mhda field tag. Excellent.

OK. This is a good time for questions, and I am certain we have some, Kate; what questions can we answer? Thanks. Yeah, there are. There have been a couple of questions about why, in certain cases, the previous indexing guidance has guidance to use a Specific term back to a specific year, and Kim's got one in chat right now. **Why does the previous indexing for knee joints say 1986 to 2023, but if you go to the term, that term has been available since 1965, so then why wouldn't I use that earlier?** The previous indexing guidance is really guidance that the MeSH staff is providing to searchers to give their best guidance, their best advice in terms of how you might search using the previous indexing. In some cases, there may have been indexing guidance or rules that the human indexers were using, which gave them some hints as to what the best terms would be for that particular time period. But really, the most information you're going to find is going to be on the MeSH record, and in those specific cases, it doesn't really explain why those specific years. So, I mean I don't think it would hurt to use those terms earlier. It's just that the MeSH staff believes that that's the best guidance for searchers. So not really much of an answer, but that's the guidance that we have to work with. In some cases, it's really obvious why

because you can see that there are actually other terms that were available Previously that might have been better. But in other cases, it's less clear because the MeSH has changed.

Let's see. So, another question related to that was for the search of Cardio-oncology; I'm sorry, I forgot who asked. **Why wouldn't You include cardiotoxicity?** Well, you might remember when we started when Catherine started this class, she mentioned that What we're focusing on in this class is really techniques and the tools available in PubMed for searching. We haven't taken a lot of time and effort to construct, you know, Necessarily the best searches for these topics. Everything considered, we didn't do a reference interview. You know these are just sort of made-up topics to illustrate the tools that you have available. So yes, in this case where you want to search with things related to chemotherapy and cardiotoxicity, yes, certainly you would search with cardiotoxicity as well.

OK. A couple of more general questions. One was **do all supplementary concepts become MeSH terms Eventually?** No. There are supplementary concepts that have been supplementary concepts for literally decades. Supplementary concepts become MeSH terms when there is such a significant body of literature, and we also need to use the addition of all the aspects of a MeSH heading in order to describe that literature. So not every supplementary concept is going to be a MeSH Term by any means.

Are there any plans for the MeSH database to offer spell check? Well, I mean, that's a fantastic suggestion. I have not heard of that improvement, but I will be very happy to pass that along. I know there are a couple more questions that have come in since I started talking. So let me just take a look at those as we move on to the next section.

Thank you. Perfect. Thanks, Kate. Yeah, we'll stop a few more times for questions. So, keep those coming if you have them. All right. So, a different category of MeSH changes that may affect your Results are hierarchy changes. Hierarchy changes can result in dramatic retrieval changes to Your PubMed search. In fact, if you ever experience dramatic retrieval Changes in PubMed, it is almost surely one of two things: either a mapping change or hierarchy changes. And this is 1 type of change that many searchers discover by Accident when they're saved. Searches regularly start retrieving far more or far fewer Results after the annual change to MeSH. So today, I'll use a hierarchy change from this year to illustrate how this type of change may affect your searches.

This change is related to Vector Borne diseases, which are Diseases transmitted by fleas, ticks and other blood feeding Species. On the screen we see the term vector borne diseases in the Hierarchy as it appeared before 2024. And I specifically want to draw your attention to its narrower term, Arbovirus infections, which has many narrower terms of its own, including Yellow Fever.

Now, we're looking at vector borne diseases in the hierarchy. After the 2024 changes took effect, a new narrower term has Been added, mosquito borne diseases. This new term is on the same level of the hierarchy as Arbovirus infections. Some of the terms that were under Arbovirus infections prior To 2024 are now narrower terms for mosquito borne diseases. So, for example, prior to 2024, yellow fever was a narrower term for arbovirus infections, but now yellow fever is a narrower Term for mosquito borne diseases. Other terms made the same move in the hierarchy, including Dengue, Rift Valley fever, and Zika virus infection.

So, let's consider how this hierarchy change could affect Your search with a thought exercise. I have both the hierarchy for MeSH 2023 and MeSH 2024 on the Screen now, and this is exercise #2 on your handout if you want to follow along there. So, if you have a saved search, can you continue to retrieve this same scope of literature, would you change your saved search? And if yes, how would you change your search? And you don't have to worry about crafting a search string. I'm really just looking for us to think about in general, how would our search strategy change. So, let me repeat, if you want to continue to retrieve the same scope of literature, would you change your saved search? And if yes, how would you change it? So, I'll give you a minute to think about that, and you can put Your answer in the chat, and then we'll talk about it together. So, if you wanted to continue retrieving the same scope of Literature, you would need to change your save search. And there are a few ways to approach this, but these are two of them and I think someone mentioned each of these. So first, you could add the term mosquito borne diseases to your search, which means its narrower terms would be included in your search, too. Or you could add the individual terms that were moved out from Arbovirus infections to your search, like yellow fever and Zika virus infections. So those are a couple of options for how you might change that with that hierarchy change.

OK, let's look at a second example of a hierarchy change. And this is a change to the same part of the hierarchy. So here we see the term Arbovirus infections in the Hierarchy as it appeared before 2024, and it has a narrower term, Encephalitis arbovirus, and that has six narrower terms of its own, including encephalitis tick-borne. In 2024, the term encephalitis tick-borne was

moved out from under encephalitis arbovirus, and they now appear on the same level of the hierarchy under Arbovirus infections.

So, I have the same question for you as before, and this is Exercise #3 on your handout. If you want your search to retrieve the same scope of Literature as before 2024, does a saved search for encephalitis Arbovirus need to be changed? And again, you don't need to worry about crafting a search string, but just like you did before, kind of generally telling me your strategy would be great. So let me know what you think in the chat, and let me repeat that, too. If you want your search to retrieve the same scope of literature as before 2024, does a save search for encephalitis Arbovirus need to be changed? Let me know what you think. All right, so let's review what we might do. So, in this case, encephalitis tick-borne is no longer a Narrower term for encephalitis arbovirus. Therefore, if you want encephalitis tick-borne to be Included in your search, you should probably manually add it. And that's what I think many of us were saying in the chat.

OK, so how do you adjust your searches for this kind of Change? For the most part, hierarchy changes offer an improvement to Your explosions. And this is on your handout as question #8. Hierarchy changes can result in dramatic retrieval changes, and they generally offer an improvement to your explosions. So, consider the new arrangement and decide how specific you want to be. A hierarchy change often comes with new terms that might be useful to add to your search. All right, it's a good time to take some more questions. Kate, what can we answer?

OK. So, there were a few questions about how we track these hierarchy changes and whether you have to check from one year to the next. So, Ed asked, **does one have to check 2023 versus 2024 in order to see the differences?** And yeah, the short answer is yes you do. If you are doing something like a systematic review and the work goes over multiple years as Catherine showed at the beginning of class, you will want to document the explosions that are included in your search using the MeSH database. If you want to check earlier years, do need to go to our online tools to do so. So, I'm actually going to put in chat right now that for the previous year, you can use the MeSH browser to explore those Explosions. So right now, we have the 2023 MeSH available in the MeSH Browser. For previous years, you can use the file downloads from the NLM Data Discovery tool, and I've included a link to that.

So, I missed a question earlier from Melissa, and I hate to miss a question from Melissa because I love your questions. Melissa, I remember you from previous classes. So you're asking basically **if you don't care about the date or if it's a brand new term, do you really still need to use that mhda tag? Do you have to include that mhda tag for previous indexing terms?** And no,

you don't have to. I think that, in some cases, you might want to. Using mhda helps eliminate the more recent records that are not precisely on your topic. So as years go on, the use of the mhda might become more important. But if you have a brand-new term and you're looking at that previous indexing and the previous term was used for some set of years that you're interested in searching and you know you don't care that you might be getting a few broader articles in your search from the last you know, few months or whatever. Then it's not necessary. But the use of mhda does help eliminate those more recent records that aren't, you know, targeted directly to your topic. So, use your judgment in restricting your search by dates or by adding keywords. You'll probably be doing that as well.

OK, so I did see a message in chat, and I haven't looked into it yet, but apparently, we did miss another branch of Encephalitis viral, which actually includes tick-borne under Arbovirus. So, it is possible that we missed something, and you wouldn't actually have to re-add that term. So, check your branches, check your explosions, and see if You're getting what you want to get when we make those hierarchy Changes. Again, you can check last year using the MeSH browser and Earlier years using the Data Discovery tool. So, I'll go back to looking at the questions. Back to you, Catherine. Great. Thank you. And yes, thank you for catching that. If we did miss it under a different branch, it is a good reminder to always double-check the hierarchy.

All right. So, we are going to move into another exercise. We've reviewed the three types of MeSH changes that we're going to cover today, and I want to do a couple more exercises to Review those. So, this is exercise #4 on your handout. Let's say you want to search PubMed as comprehensively as Possible back to 2010 for literature related to genetic Risk score. How would you do this? Let's go over the steps together. So, I'm going to open up MeSH first. So, I'll go down to that MeSH link at the bottom of PubMed and Open up MeSH, and I'm going to search for my term genetic risk Score. And here is the MeSH record and I see that I can search for this Concept using the term genetic risk score starting in the year 2024. Now we want to look for our previous MeSH terms for this Concept and we have one genetic predisposition to disease, which Was in use from 1999 to 2023. So, we want to think about how we would restrict our search for A range of indexing dates. And remember, we only want publications indexed in 2010 or later. So, this is what our search string might look like. I'm going to copy and paste it, and then we'll talk about it, and I'll make the screen bigger. So here is what we might search Genetic risk score tagged as MeSH or (Genetic Predisposition to disease tagged as MeSH and 2010: 2023 tagged with mhda).

OK, so now that we've reviewed that exercise together, let's try another one. So, let's say this time you want to search PubMed as Comprehensively as possible back to 2019 for literature related to mass shooting events. How would you do this? This time, I'm going to give you a few minutes to create your own search string. And once you've got it, you can put it in the chat and then We'll go over it together. OK. Yes, we've gotten some great answers here. Thank you for putting your search strings together. Let's review how to build this together so that we can all kind of see how we got our search strings. So first, I will go to MeSH and I'll search for make my screen a normal size. First, I'll search for the term mass shooting events, and there Is my record. I see that this term was introduced in 2024. So, I want to look for my previous MeSH terms for this concept, so I'll Scroll down to find those. Here, I see that we have two gun violence in use from 2019 to 2023 and mass casualty incidents in use from 2008 to 2023.

So how would I restrict my search to a range of indexing dates? And we're only going back to 2019. So, this is what that search may look like, put it into our Search builder and this is the same search string that I think Many of you came up with. So, what I might do is mass shooting events tagged with MeSH Or (gun violence) tagged as MeSH, mass casualty Incidents tagged as MeSH, and 2019: 2023 tagged with mhda Again. And I do want to note here that you may not always use all the previous indexing terms that are available. So, as Kate and I have said, you should really think about What is your topic and which combination of terms will make the most sense for you. So, the moral of the story is to consider your concepts and explore the vocabulary to determine the right combination of terms for your search. OK, and we can stop for one more round of questions before we Jump into our post-test. So, Kate, what questions can we answer at the end here?

I do not see additional questions, but I may have. If I missed your question, could you please re-paste it into Chat? I don't want to miss any. I see a couple of comments and I thank you for those. Again, if you have suggestions to improve MeSH, please send those in. We shared the link earlier. OK, we see something's coming in. Oh, I think you missed a closed parenthesis in the example that you were displaying. Or it might have just sort of done a little carriage return over to the next line that you couldn't see on the screen. But yeah, clearly, if we have an open parenthesis, we should have closed parentheses. Thanks, Heidi.

Yes, thank you. I might have missed it by copying and pasting, too.

OK, let me see. Nancy wants to know, **where is the MeSH?** Let me investigate Nancy, I'm not quite sure what you mean, but let's move on. And then, if there's any time at the very end, I'll see if any more questions come in.

Oh, wait, there's another one here. And some of the questions really have to do with **how do you improve that search?** And again, we're not really talking about what is the best Search. We're just showing you some tools today, some tools and techniques that you can add to your toolbox. But it's really up to you to determine what are the best terms to retrieve the literature you're trying to retrieve. All right, so if there are additional questions I missed, please put them in chat. But I'll let you go on, Catherine.

Thank you. Great. Thank you, Kate, and thank you, everyone, for your questions Today. So, as promised, it is now time to take our post-test and see what we've learned today. So, I'll ask Brittney to launch that now. It is the same questions as our pre-test. So, if you'd like, you can follow along on this slide or on the 4th page of your handout. I'll give everyone a couple minutes to answer and then we'll go over the answers together. Great. I will ask Brittney to go ahead and show us our answers for the post-test, and we'll go over those together. Great. All right let's look at the correct answers together and see how we fared.

So, question #1, when a new, more specific MeSH heading is added to the vocabulary, it is applied to records that were indexed in previous years. Is this true or false? And this is false. Generally, this would require re-indexing of records, so you'll need to use the broader term or use the Previous indexing information to search for records indexed prior To when the term was available in MeSH. And there are some rare exceptions.

#2. When a MeSH term is replaced, the term that was replaced is retained in MeSH as an entry term. So, replaced terms are almost never truly deleted from MeSH. They are retained as entry terms to the relevant current term.

#3 The PubMed search results for a new, more specific term, like blue light, will be included in the results for the broader term above it, like light. True or False? And this one is true. Searching or mapping to a broader MeSH term in PubMed will Automatically explode to include all narrower terms below it in MeSH.

#4. If my saved search suddenly retrieves many more or many Fewer citations on a regular basis starting at the end of a Calendar year, what is the most likely explanation? And in this case, it is

Hierarchy changes are the most likely reason for a dramatic Change in search results. You might also look for mapping changes. So, for example, if your search term wasn't in MeSH before, but maybe now it's an entry term to a MeSH concept, then that would also dramatically alter your search.

OK, at this point, I'll ask Brittney to put the handout Answer key link in the chat for us, and we will go over our main Takeaways for today. So, to adjust to changes in MeSH, you want to check MeSH Mappings in your PubMed search details, check Automatic Explosions in MeSH use the year introduced, previous indexing guidance and broader terms with mhda to craft searches for older records. Read about the year-end MeSH changes in November and December in the NLM Technical Bulletin. Thank you so much for joining us today for your participation and all your great questions. We appreciate it and we hope to see you at future NLM webinars. Thanks so much.