Practical Application Of Ergonomic Principles: Preventing Musculoskeletal Disorders In New Mothers
Recorded August 8, 2019
Presenter: Sara Loesche, MS, OTR/L, CHT
OccupationalTherapy.com Course #4383
Today's course is Practical Application of Ergonomic Principles: Preventing Musculoskeletal Disorders in New Mothers. Our presenter today is Sara Loesche. She's an occupational therapist with over 15 years of experience. She began her career working in pediatrics, then moved to a hospital setting where she gained experience in acute care, acute rehab, and outpatient OT before becoming a certified hand therapist in 2010. With this role, she was able to explore ergonomics as an area of interest by performing job site evaluations and helping injured workers return to work. She's now an assistant professor at Thomas Jefferson University and has utilized her clinical background to look into the health and wellness of new mothers and supporting these caring for small children of which ergonomics can play a large role. Welcome, Sara, so glad to have you.

So, maternal health is one of these emerging practice areas for occupational therapy practitioners, and there is lots of ways to get involved in it and lots of different interests that you can start to learn more about. But one of the areas that I am looking into is using ergonomics in my background, in that and hand therapy, to help prevent musculoskeletal disorders. So I am a mom of three young boys, but that's not really where my interest started. It came out of my clinical experience. So about 10 years ago when I was in outpatient hand therapy, I was getting an increase in referrals and they ended up being new moms who were being referred in for De Quervain's tenosynovitis. So they would get an injection from the doctor and then he would send them to me for a splint. And it was basically one and done, make the splint and be done with it. And I thought we can do better than that because I didn't feel I was doing the best I could to help them because that was just kind of putting the band aid on the problem. So using my background and work in industry in ergonomics, I started thinking about how we can do more activity modifications. So obviously, that takes a little bit more problem solving, a little bit more time, and being really client centered. But definitely worth it to
start looking at the underlying behaviors and helping to fix them rather than just putting on a splint and receiving an injection. So, that's my background and interest.

The learning outcomes for today are that we will talk about the physiological and psychological factors that make moms a specialized population for occupational therapy intervention. We'll talk about ergonomic risk factors that are present when postpartum moms are performing child-care-related tasks. We'll discuss a prevention, or a health-promotion approach to caregiving for young infants and children, and then talk about practical strategies for postpartum moms to implement, to try to reduce the incidence of musculoskeletal disorders. So if you look at the practice framework, caring for children, or child rearing, is actually an IADL. Within that IADL, I feel like we need to treat new moms as a special population 'cause lots of people care for young children. It could be Mom, it could be Dad, it could be grandparents, other caregivers, daycare workers, babysitters. There's lots of people who care for these children but really, mom's a specialized population. child care is physically and emotionally demanding. Mom usually has what could be considered a 24-hour workday here, because not only is she caring for the child during the day, but a lot of times, as you may know, this also involves getting up during the night and just a constant kind of vigilance in caregiving. Also, when Mom does get downtown from child-rearing tasks, she's often doing other demanding tasks, or physically demanding tasks in the home, or at work. There's also the postnatal body changes that are occurring, which I'll discuss in a few slides, and that the evidence is really pointing to the increased incidents of developing musculoskeletal disorders, and there's really a lack of knowledge, or lack of evidence out there of how exactly we can help that.

Ergonomics and occupational therapy fit really well together. We're really used to thinking of ergonomics as being a skill for work in work in industry but really it fits with occupational therapy because if you break it down, it's really using our PEO concepts. So looking at the person, the environment, and the occupation, and making sure that
there's a good fit between those three things, not just dumping a person into a job or a role and saying, here, do this job. So really, there's an interaction between the person, the environment they're working within, and the occupations that they're engaging in. So when we look at it this way, occupational therapy practitioners are really well suited to address ergonomic concerns both within and outside of work and industry. So if we take the concepts that the AOTA uses to describe ergonomics and rework them for Mom, it's gonna look more like this. So first, helping Mom care for her child if she has an injury, like a musculoskeletal disorder, or an illness, or a disability, certainly we can do that. Another one would be using the health promotion model to help Mom do her job better, or safer, or healthier. Another thing will be thinking about how Mom can prevent a musculoskeletal disorder or pain or discomfort from occurring, and then consulting with families to help them maximize their role performance. Here's where these concepts are gonna start to deviate a little bit, because Mom isn't going to get workman's comp or days off if she starts feeling discomfort while doing her job. So what we need to do is really help her and the whole family maximize their role performance so they can continue to their job. So the overall goal here is really the same. We're going to decrease injuries, decrease fatigue, look at decreasing aches and pains that are occurring while doing the job. Increasing productivity and workplace morale, or family, family morale. Increasing the ability to enjoy activities outside of work, and in the scenario of ergonomics supporting new moms, OT practitioners are gonna support the mom, the child, and really the whole family, and promote maternal, physical, and mental wellness.

Traditional roles tell us that we can work with new moms, so with maternal health. But additional skills are definitely available and useful to enhance your knowledge and ability to address Mom's concerns. There's also sometimes a general lack of awareness that occupational therapy can help fill this need as part of an interdisciplinary team within maternal health. So there's other studies, there's plenty of studies if you look for them. Not all of them are in the United States. In fact, many of
them outside of that, but here’s a study that was a Dutch study where women were requesting more education, they were asking for more education in that postnatal time frame, and that education should be focused on physical, emotional, and psychosocial changes that are occurring postnatally. And they needed to feel more prepared to take on the role and responsibility of motherhood. And it talked about how important it is to address this from a wholistic standpoint from being client-centered, and really needing access to this type of service. So this is a perfect fit within occupational therapy. There was another study, it was 92 first-time mothers, and they talked to them eight weeks postpartum and they wanted to know, moms wanted to know more about stress management, mental health, and other supports to help parent. They didn’t feel like the best way to do this was just to give a handout and send them on their way, but they really wanted to talk to somebody face-to-face, or watch videos, or engage in a phone call. So if mom has a preexisting condition or there’s a disability within the child, occupational therapy, services are gonna be offered. But what we need to do is shift the focus to offering these services for what’s considered the well population as well.

So here is something out of the Maternal and Child Health Journal, and they were talking about strategies to increase postpartum health and wellness, that’s something that I was just talking about from those other studies as well. But this is coming from the Associations Maternal & Child Health Programs. So what’s typical is that a woman’s gonna have a six-week postpartum visit, and this is to pretty much focus on that her reproductive organs are healthy, maybe discuss contraception going forward. But otherwise, Mom’s going to really be spending time visiting the pediatrician on a regular schedule, and there the focus is on the baby. So we lose a little bit on focusing on the whole picture of helping Mom. This article discusses the Associations Maternal & Child Health Programs, and their idea to reimagine the postpartum visit and improve postpartum care and wellness, and feeling that what we need to do is provide a mother-centered solution, because we know that improving Mom’s health is going to improve overall maternal and infant health.
So the problem is will moms seek out that help? And I really like this graphic of showing all the reasons that Mom might not be doing this, all the barriers in the system and then what we can do to support Mom in making sure that those barriers don’t exist, or overcome those barriers. So if she needs some help, she feels comfortable asking for it. So this is coming from the Associations Maternal & Child Health Programs. I know the College of Obstetricians and Gynecologists is also making new recommendations to push up the six-week visit, shorten the time period, and also make it a more comprehensive visit. So it’s a great opportunity for occupational therapy practitioners to jump on board and help here. During pregnancy, almost all women are going to experience some musculoskeletal discomfort, as many as 25% of them are going to have disabling symptoms, and the biggest culprit is going to be low back pain. But what’s happening is that because of this discomfort, women are starting to stop performing, or starting to stop, are not engaging in at least one daily activity that they want to engage in due to this, due to the onset of pain.

So some of the issues that are at play here, it’s soft tissue edema, or the idea of fluid retention, that’s going to begin during pregnancy and is still resolving in the postpartum days. Another one is ligament laxity. So this happens throughout pregnancy as well because of producing increases of relaxin and estrogen. And then that ligament laxity, along the weight gain that’s occurring, is just a recipe for joint discomfort. In addition, there’s weakened core muscles that are occurring as the body’s preparing for the expanding size of the baby. So the abdominal muscles are actually starting to separate and this can occur in the second and third trimester, or it can occur as a result from pushing during delivery and lead to something called diastasis recti. This is also going to contribute to a risk of back injury due to the poor posture that it’s going to result in. So there’s a long list of risk factors of why this occurs, what’s Mom’s exercise status before pregnancy, what’s the size of the baby? Mothers over the age of 35 are gonna be at an increased risk, size of the pelvis,
whether you’re carrying a single or multiple children, and then 30 to 60% of women are going to experience this. And up to 45% of them will still have diastasis recti six months postpartum. So it’s large numbers, it’s a pretty common thing that women are experiencing and another area that can be addressed. Kind of going in alignment with this is pelvic floor muscles so they’re gonna work hand in hand with the transverse abdominis with the deep abdominal muscles to help support posture. Moms are also obviously undergoing sleep deprivation as they’re waking often for baby’s needs and feeding schedules. There’s going to be a shift in the center of gravity because pregnancy distorts the natural curvature of the spine and is not going to just immediate correct itself after childbirth. So I’ll talk about that a little bit more later as well. Then there’s also the emotional stress of being a new mom while maintaining all of your other roles. So this is what I call the slippery slope of motherhood, or the health risks that lead to the slippery slope.

So we already said that there’s a lot of postpartum stress and if you don’t address that postpartum stress, it can lead to anxiety, fatigue, decreased self care. This is going to put Mom at risk for either physical or mental illness or disorders, this includes postpartum depression, and this is going to impact the health of the entire household. So things like early discontinuation of breastfeeding, a negative maternal perception of the infant and compromised attachment. It can lead to delayed language acquisition in a child, or behavioral problems within children. So there’s all kinds of literature to support that kind of thing, but this is like the slippery slope starting out of feeling stressed and overwhelmed, and then it just kind of continues to snowball. There’s links to postpartum depression as well here. So a study by Angelo and Colleagues in 2014 talked about the influence of body posture on the association between postpartum depression and pain. So it was a study out of Brazil using 80 women postpartum depression when their back pain intensified and exacerbated and the changes in posture alignment that happened at six weeks postpartum. And they felt the pain had a connection with postpartum depression and back pain specifically could both a risk
factor and a comorbidity of postpartum depression. What I also liked about the study was they talked about how physical and mental disorders are interdependent. So you can't look at one without looking at the other, they're going to influence each other. If one's occurring, those physically symptoms could lead to mental issues that Mom could be experiencing.

Another study by Lewis and Colleagues in 2018 talked about collecting data for a Healthy Mom II Trial. So what they're looking at is exercise and wellness interventions to prevent postpartum depression. Exercise is a known intervention for depression already, but they are trying to create the evidence to say that exercise can be an intervention for postpartum depression specifically. So they're collecting baseline data, they've got about 450 participants now, and the idea is that exercise is advantageous psychosocially due to its impact on Mom's weight loss after having the baby, the fact that other psychosocial interventions, like counseling, are going to be costly and time-intensive, and that exercise will help to teach motivation for healthy behaviors that are longterm and can impact health in a more longterm way. So the connection here is that exercise is also advantageous to reducing musculoskeletal disorders by preparing the body for birth, helping the body to recover from birth, and being able to perform the demands of the child-care tasks. So using a health promotion model would be important.

Here's an article from the American Journal of Occupational Therapy that was recently published, and it says if Mom isn’t going to seek out help, can we approach this from a wellness and health promotion model, that she’s not going to need to seek out help once symptoms are occurring? So OT practitioners are seeing women during this perinatal period in clinics with musculoskeletal complaints, and conditions that are already kind of brewing and developing. So what needs to happen is educating those women and families to change their habits, modify child-care techniques, and this may halt the injury progression and may positively affect the way they approach future
pregnancies and children. And I’ve seen this firsthand with some mothers that I’ve worked with in the clinic who said that the fact that this is impacting their ability to care for a child is really making them think twice about having their family expand and having children in the future. So the research also shows that women are going to expect pain and discomfort during this period, so maybe they’re not going to disclose their difficulties or have other reasons for not seeking care. We just saw this in the visual that I used previously in the slide about the reasons why Mom isn’t seeking out care or those barriers. Also, the answer here is that occupational therapy can address these issues preventatively with a health promotion type model. So when problems begin, if we look at that kind of slippery slope model again, tasks such as feeding, holding, changing baby, bathing baby, they lead to the use of these awkward and static positioning, repetitive activities, and forceful exertions. So a new mom may begin to feel musculoskeletal pain or experience a musculoskeletal disorder within the first few weeks to months of motherhood, but they're likely going to ignore this discomfort because they're going to focus on the needs of the baby first.

In a study, it's by Maynard & Blain, they looked at the combination of women, work, and child care, and they stated that working moms who simultaneously manage a job, raise children, and maintain a home may find this endeavor to be physically and emotionally challenging. They also stated that, "performing child-care activities "for children in the birth to three range is perceived "to place the greatest demand "for physical care on mothers." So when talking about musculoskeletal disorders, what that means is anything that affects the muscles, tendons, ligaments, nerves, blood vessels, discs, et cetera, and your basic muscle sprains and strains, and they make up a huge portion of musculoskeletal disorders. So this is really kind of an umbrella term. You might also hear it called cumulative trauma disorders, repetitive stress injuries, or repetitive stress disorders, or an overuse type syndrome, and what it's usually caused by is repetitive motion during a task, sustaining one position over a period of time, a forceful movement, or multiply forceful movements, awkward postures and positions,
and then pressure points or contact stress. The Bureau of Labor and Statistics in 2015 put out the average number of workdays missed because of overall injuries for workers, and that overall number was eight days. So on average, when a worker's injured, they're gonna miss eight days of work. Well, if that worker's experiencing a musculoskeletal disorder, that increases to 12 days of missed work. But like I said before, this doesn't translate to our idea of a mom having a musculoskeletal disorder because she can't just miss days of work, or take off, or go on a leave until she's feeling better.

So these postpartum changes that we talked about, all the things Mom's going through after having a baby, plus all the biomechanical stresses of child care, are part of the perfect recipe for a musculoskeletal disorder. With postpartum goals, if we can just address this idea of movement, of fluid pain-free, efficient movement, instead of that slippery slope towards disability, we can move toward feeling more wellness, not only for Mom, but her entire family. So this starts with the core idea of movement. Also, practitioners who are non-therapy practitioners are recognizing the need to address and refer for education regarding musculoskeletal disorders. So, these are physicians who are saying these quotes, is that, "Maternal concern should be taken seriously," not with, "just accept it attitude," but that, "should be replaced," with let's look at therapy and see if that can help. Instead of just oh, that is what it is, deal with it, they're starting to say, well, there's things, more thing we can do. Another group said that you should approach new mothers' concerns with reassurance and patient education and make them understand that there are, again, more avenues to having Mom get help.

So why occupational therapy needs to address this. I was reading some different things in the literature. The first one is a study by a chiropractor, the second one was something that showed up in the Miami Herald, in the newspaper, and the first one was a case report of a 32-year-old female who had deQuervain's. So she was a stay-at-home mom of two boys, aged seven months and three years old, and she
started feeling the typical symptoms of deQuervain’s and she felt like the onset happened from pulling the wagon on their daily walks. So that makes a lot of sense. So her doctor prescribed that she would take some Ibuprofen and wear a thumb spica splint. Well, she immediately found that the thumb spica splint was too cumbersome to wear during household activities and child-care tasks, so she stopped wearing it. So she sought out the help of the chiropractor. So what he recommended was eight weeks of therapy where she would go two times a week. He used interventions such as stretching, eccentric strengthening, and used Graston Technique, and after eight weeks of therapy plus four more weeks of a home exercise program, she really did report reduced pain. So that’s great, but that is an awful lot of time to be able to spend going to therapy appointments with two young children. And when he talked about what activity modification he told her to reduce this from occurring in the future, his ideas were to just use the other hand, to just pace out your activities, and divide them up throughout the day, and ask your husband to do the difficult chores. So this was actually published within the article that those were the three activity modification techniques. So I felt like they were pretty poorly addressed because not all moms are going to be able to just kind of sit and pace all their tasks during the day. I don't think it's realistic to say just use the other hand because that's a recipe for creating musculoskeletal disorder in the other hand as it takes on more strains. And not everybody has a husband who's around to take on the difficult chores. So that's just not always an option. So that, I felt, was kind of poor, poor recommendations on the activity modification end of it. The next one out of the Miami Herald was in a section of the newspaper, it was kind of just ask the physician. So there was a woman who was reporting that she had thumb and wrist pain, she didn't know why it was starting, she was a work-from-home mom, and she does computer work, she likes to garden, and she has a three-month-old. So this physician came back saying don't worry, this is deQuervain’s, this is total normal that happens postnatally. He said just you should check with your pediatrician to see if you can take medication, you should get an injection if it’s really severe, maybe see an orthopedic hand specialist, and I really hope
you get better. So again, not providing any kind of information that was more in these activity modification, maybe if you change your habits, your pain will change as well.

So for conservative management for musculoskeletal disorder, some of the common things that you’re going to see as recommendations, you’ll see recommended, especially for upper extremity type conditions, that an orthosis be made. So typically, it’s your thumb spica, maybe wrist cock up, depending on the condition, but what we’re finding, I found this in my practice, and then that article I was just saying as well, is that Mom’s gonna say it’s big, it’s bulky, and I don’t wanna wear it. And I think that’s totally fine. What I find more useful is sometimes having Mom use a neoprene wrap, maybe wearing it at night versus during the day, and you can kind of talk with Mom and work around and figure out what she’s comfortable with if an orthosis would be something recommended for the condition. Taking oral medications, so that can work as an anti-inflammatory technique. Not all moms are gonna be open to that, not all moms are gonna be able to take that. I know there’s literature now saying that some meds are okay while breastfeeding, some are not. So definitely checking into that. Getting the steroid injection, so especially for this small tendon in the thumb, if it's something like deQuervain's, there's actually a Cochrane review that came out in 2009 that said there's weak evidence to support. They can’t draw firm conclusions regarding the effectiveness of steroid injections for deQuervain’s. Also, a lot of physicians aren’t going to do multiple injections for deQuervain’s, 'cause of again how small those tendons are, will actually end up weakening those tendons. And then using ice or modalities. So can you imagine telling Mom just to sit down, put an ice pack on your wrist, or your back, for 10 minutes several times throughout the day, let the kids run wild. It doesn’t always work, again, to fit into the job of child care, that you can just sit and rest and do some of these more biomechanical interventions. Go to outpatient therapy, if Mom doesn’t have time to talk about her conditions as being something that is impacting her ability to care for children, I don’t know that she’s going to have time to steadily attend an outpatient therapy regimen. So that’s another one that’s not the
best choice. And then surgery, obviously, we’re not gonna make the recommendation that right away Mom jumps to surgery for a condition like deQuervain’s when the literature says that as baby gets bigger, if there’s other ways to address it rather than surgery, especially if you think child-care demands are the reason for the issue and for the pain. So what a lot of moms are doing is they’re just living with it because these aren’t going to work for Mom’s ability to take care of children while trying to do some of these conservative management techniques. So, I’ll just live with it till it’s gone. And that’s really not, I don’t think, the best solution. What I think we can do is use this ergonomic idea and use it in the same model that we would with office ergonomics.

So the solution is using ergonomic strategies to reduce the risk factors and help Mom take care of herself while she’s taking care of the baby. So we use the same approach. Look at the job of child care, or look at child care as a job. So this is a model that I reworked. It’s supposed to be an interactive and dynamic model to look at work systems. But what it shows is the importance of looking at the whole picture of this job. So Dahl, who is the author of this systems model, he felt like workers and job tasks, tools, and equipments, and environments, all have to be looked at together. So I think that we need to do that too. If we look at Mom’s job holistically, we can look at the job is being a mom, Mom is the worker, and then all of the tasks that go into her day in taking care of the child. So feeding, bathing, changing diapers, lifting and carrying, playing, all of those things, and then all of the tools and equipment. So anybody who’s looked at a baby registry these days knows how much equipment there is needed to take care of a baby. But there’s just a lot out there so the things that you need to take care of a baby, in terms of the tools and equipment, things you’ll be using and interacting with. And then the environment, so obviously the home would be a good environment, but we don’t just keep baby at home. There’s the car, there’s the community, going to the doctor’s office, going to parks, and all of those things are the environment in which the occupations will be taking place.
This is an interesting study about how we teach ergonomics for homemaking-type tasks. So this happened at a hospital in Singapore and they were looking at ergonomic education of women with repetitive stress injuries, or with musculoskeletal disorders. And they picked five domestic tasks to look at and educate Mom on. So it was cooking, cleaning, grocery shopping, laundry, and child care. So that’s completely realistic that those are all the things that Mom would be doing while in addition to taking care of the baby, and what they looked at was how can we make this education effective? Because they found that as moms are talking about their routines, there’s a lot of emotion attached to these routines, so they have their way of doing things, and that they want to do it their way. Somebody comes in and just says, well, now you need to do this all a new way, Mom may have feelings about that because of the way she’s always done things, or the way she wants to do things. They also looked at behavior changes that were needed to decrease the biomechanical strain, and again how to educate Mom on decreasing biomechanical strain during homemaking tasks. And what they found was the real challenge here was an adherence. So after talking to Mom and saying, what would make you change the way you’re doing things at home? Mom was reporting, the women were reporting, that what would help them to change was to be client-centered, listen to me, how I do things. Don’t just say how everybody takes care of babies, or does cooking, or laundry, or grocery shopping. Listen to how I’m doing it. And then the other part of that was when they did feel like they were being listened to, it increased the credibility of that practitioner and that client-therapist relationship, and that the patient was actually more willing to make those chances just simply from feeling like they were being listened to. And I thought that’s a really important thing to bring up when you’re talking about Mom and how she’s going to care for her baby, her children, and maintain her household.

So the common areas of discomfort that we’re seeing, back is always definitely in there. So low back, upper back, the order changes of which has the highest incidents, but they’re both high in numbers and both usually first on the list, as something within
the back. Then the shoulders, neck, wrist and thumbs, also again with looking at deQuervain's. So all of these areas are reported as areas of discomfort during child care. What the common risk factors are, forceful exertions. So thinking about how you lift up baby in and out of equipment, not only lifting baby, but you’re also lifting equipment. So putting strollers in and out of the trunk or out of the car, lifting that infant carrier. All of those can be considered forceful exertions. Also repetitive activities, so thinking about the repetitive activity that happens when changing baby, bathing baby, changing diapers. Definitely things that occur with feeding can be repetitive activities. Awkward and static positioning I think is huge. So when you get into position for feeding baby, where it’s breastfeeding or bottle feeding, how you’re going to sit with baby during floor time, a lot of play occurs on the floor. So as Mom's sitting on the floor playing with baby, it can lead to awkward positioning. Rocking baby to sleep can take a long time sometimes, so that’s a static position for a long period of time. So if baby's comfortable, Mom's not moving, right? Even if she's in this really awkward position. Oh, and bathing also. So there's no good way to bathe a baby in the tub, I found. You can definitely make it better but there's no one way that it’s like, this is the way to bathe a baby because you always end up in some kind of awkward posture unless you have this huge spacious bathroom and lots of area to move around in. And then contact stress. So silly things like just pushing a stroller can relate to contact stress through the hands, or holding that infant carrier in the crook of your arm, in the elbow of your arm over a period of time, that's contact stress. Or even leaning over the tub while you’re bathing baby can put contact stress on different structures in the upper extremities.

Looking a little bit closer at deQuervain's, so I've been talking about how this is one of the conditions that shows up in new mothers, definitely, it’s related to fluid retention and hormone changes that happen during and after pregnancy, plus the overuse during child care. So a quick definition here, deQuervain's is that first dorsal compartment that holds the APL and EPB tendons of the thumb. So what happens is
those tendons in that area get swollen and inflamed and those tendons have difficulty moving fluidly through the tendon sheath, and the result is radial-sided wrist and thumb pain. And it gets worse with pinching and gripping-type activities. It also gets worse with ulnar deviation within the wrist. So there was a study done in 2017, it’s 259 Chinese women, and what they reported was that, almost 67% of them reported that they have wrist pain after childbirth. 84% of them were still reporting that was persistent two months after giving birth and that they were saying that these symptoms were moderate to severe. And the area was the radial side of the wrist, so that’s kind of classic deQuervain’s. The people who did the study, the researchers, they had a hypotheses that the factors that were causing this was the baby’s size, breastfeeding concerns, and then if they did or did not attend birth classes. But what the study also brought up was that one of the risk factors they felt was if it was the first child. So the first child, they were hypothesizing that they were developing wrist pain within those first eight weeks because they did not have experience with the demands of child care and the best way to go about these tasks, and it was just kind of something they weren’t anticipating happening. Even if they did go to classes beforehand, when you’re actually doing it in the moment, sometimes it’s hard to implement those techniques, you just kind of do things to get them done, and sometimes Mom’s just again getting through the day, making sure baby’s okay at her own expense.

So some basic wrist and thumb positioning tips. I’m gonna show this in different scenarios later but in general, the number one this is avoid the L position. So when the thumb is in kind of that palmar abduction, that L position, this is a risk factor and going to cause discomfort. Another thing is making sure Mom is keeping a neutral wrist. So it's not flexed or extended too much. Either one of those positions can cause discomfort, and definitely going into ulnar deviation is gonna cause discomfort, but also that’s gonna increase pressure through the carpal canal. So if Mom had some carpal tunnel-like symptoms beforehand, this could exacerbate that as well. Using the larger joints and muscles. So thumb and finger muscles are not big muscles, not big
tendons, and making sure that the weight of baby is going to be distributed across joints and using the larger muscles, maybe up into the forearm and upper arms is better, and loosening up grip. So not gripping things as tightly as maybe they need to be gripped, but reminding, a conscious reminder, to loosen up your grip when holding baby, holding objects, and things like that. So to get into some more specific scenarios, breastfeeding is definitely an area, if Mom chooses to breastfeed, that she's going to be doing it often, she's going to be in positions for periods of time, and if baby's happy, Mom's probably not moving. Because it's not the glamorous, easy thing to just breastfeed a baby. There's some strain and stress that goes into this in terms of positioning, in terms of latching, and all that good stuff.

So there was an article in a magazine in Toronto and it was about a case of Mom reporting wrist and thumb pain while she was nursing, it was actually her second child. It started around four months, and it impacted her ability to do everyday activities. So picking up her kids, driving, exercising, and other activities, but she was ignoring it because her goal was to breastfeed for the first year. So she ignored that pain and she was successful in her goal, but then she was, second time around, thinking, this is starting again. She reached out for help to see how she could help reduce these symptoms. So the person who answered this article was from the La Leche League in Canada and she provided answers about musculoskeletal disorders related to breastfeeding, mostly including deQuervain's tenosynovitis 'cause that was the complaint of this client. So one of the things that she brought up was that this can be caused by holding the baby's weight in the wrist in the hand, you're feeding multiple times a day for extending periods of time, and this can really cause strain. She also said that this cross-cradle position is usually, the cross-cradle position, which is when you hold the arm opposite the breast to support baby and head, this is usually used for initial training, but when Mom is using this past that newborn stage, sometimes that's when symptoms can occur because it's really only recommended, or only intended, for teaching and learning in the beginning when baby's very small. As baby gets bigger,
the cross-cradle approach can cause more biomechanical strain through the hands and the wrist.

So, her suggestions, and if you look at the picture that I provided here, this isn’t cross-cradle, but this is actually the cradle position. So you can see that Mom’s arm is on the same side, so her arm supporting the baby is on the same side of the breast, rather than the opposite side. So this cradle position, you can see that her thumbs are tucked in, they’re not in that L position, wrists are in neutral, and she’s utilizing a positioning pillow. So other suggestions is that Mom can be semi reclined with the baby tummy-down against her chest, and then move baby to the breast for the latch, versus the breast to the baby. So move the baby to the breast, support the baby’s weight with your arm and not the pillow because if you support baby directly with the pillow, you can see her arm’s in between the baby and the pillow here. With just the pillow, sometimes the baby is going to have a very shallow latch, which is gonna be more unsuccessful. So using your arm to help position and then leaning back so gravity’s actually helping you support the baby, rather than your own muscle strength. So trying different positions is also another suggestion. So cross-cradle, cradle, there’s also football hold, side lying, back lying, these are all easy things to look into and make recommendations. But then just know that Mom should be in position before baby’s in position here, so she can make sure she’s comfortable before baby gets latched on. If bottle feeding is the way to go here, same ideas. Keeping a neutral wrist, making sure Mom's in position before baby's in position, not keeping a tight grip on the bottle. If at all possible, avoiding the L position in how you're holding the baby. And then think about what joints are supporting the baby and making sure it's on the larger joints, and not on the wrist and the fingers, reducing the strain through the wrist, and the fingers and the thumb. Also, if you're bottle feeding, sometimes there's going to be pumping. Mom might be pumping at the same time and there's been things that have come out, or suggestions. So not using a manual pump, obviously, trying to use an electric pump. But there’s also now devices to hold the cups in place so Mom doesn't have to hold
them in place. So avoiding some more static positioning, and then like I said, yes, using electric pumps versus manual pumps as well.

Stroller position is another fun one. So let's get out and use the stroller, let's get baby off her walk, that's going to help with exercise, great. But along with that, be mindful about the hand and wrist positions while pushing the stroller I think is really important too. So one of those things, we make recommendations all the time with walkers and canes for ambulation and making sure that that individual doesn't have their shoulders hiked up and that the right position is there for their arms to be in a nice relaxed position. We need to do the same thing when recommending how Mom is gonna push the stroller. So making sure that her shoulders aren't up at her ears while she's pushing that stroller, and they're nice and relaxed, that there's a soft bend in the elbow. So a lot of strollers are going to have an adjustable handle on them, this one does have an adjustable handle on it, so it can go up or down. This is the position that I chose to use. We can see that, you can't see the rest of the body, but there's relaxed shoulders, little bend in the elbow. But what you can see in the bottom picture is a neutral wrist. So traditionally, we're gonna go into pronation and push that stroller, right? Sometimes that's going to result in an extended wrist versus a neutral wrist, and also the thumbs being wrapped around that stroller handle versus in that kind of nice tucked-in position. So if you take the stroller handles here and instead of having a pronation push, you can go into a neutral wrist and forearm, you can actually tuck the thumb in, have a neutral wrist, and avoid contact stress through the wrist if you just change up the position of the hand on the stroller. You still have control over the stroller, it can still have the maneuver ability, but it's a biomechanically better position for the hands and wrist.

In terms of lifting, hold, and carrying baby, avoid the L and scooping. So it's really easy with baby is to scoop underneath the armpits and in the axilla area, and then you have that L within the thumb and the hand. So avoiding the L, if you can, and scooping
underneath baby. So older children definitely, you can scoop by just tucking the thumb and picking them up under the axilla. With smaller children, you can scoop underneath the body and the head. But either way, you can avoid the L when picking up a child to avoid that strain and the risk for deQuervain’s. Keeping a neutral wrist and not getting in an awkward position with the wrist, trying to keep baby’s weight on the forearm when lifting and holding. And then when carrying, if you can carry with a carrier, that’s a great way to take some of the strain off the arms. So Babywearing International is a really good resource to looking at the different types of carriers and how to use them and wear them. So I suggest looking at that if you want more information on actual specific baby carriers.

So in addition to wrist and thumb pain, back pain always turns up as a problem that moms are reporting. So here is a study, it was looking at the proportion of women that are affected by back pain, and the impairment of maternal performance of daily tasks due to back pain, and during urinary incontinence. They looked at moms 12 months postpartum. But what they found was that 77% of these new moms were experiencing back pain with a wide range of functional impacts. So it was definitely impacting what they did in their everyday activities, and that the impact of back pain was more limiting than the impact of urinary incontinence, again, at 12 months postpartum. So they felt that improved function with daily task is going to improve overall quality of life, no kidding. And if these symptoms are common and impacting function, then we should be able to help know what care should be provided to improve it. There’s also a source that says that back pain in previous pregnancies is going to make an individual more susceptible to back pain in subsequent pregnancies. So again, if we know this is going to happen, then we know that we should be doing something to prevent or educate on the impact of that. So one of the biggest things I do when talking to new moms is talking about posture. So just talking about the fact that there’s normal curves of the back, and those curves must be maintained in order to keep the back safe. So that comes with maintaining that lumbar curve, the cervical curve, and then definitely a
neutral to anterior pelvic tilt. So I'll have Mom stand up and feel that lumbar curve in her back, and then do some different bending activities where she feels it go away. So as you bend over at the waist, you can feel that lumbar curve completely flattens out. But if you bend at the hips and knees, you can feel that the lumbar curve is maintained. So doing some actual experience activities to have them feel that lumbar curve and what good posture feels like. Another thing that's important to note is the amount of disc pressure that goes through the spine. So laying supine face up is the least amount of pressure through the spine, and then it incrementally increases as you go side-lying, standing, and sitting. But if you'll look at the last that have the greatest amount of pressure through the spine, you'll see seated, bending forward at the hips, standing with the weight, and seated with the weight and bending. So it's perfectly reasonable to think that Mom is going to be holding the baby and have to bend forward for something, and that's really gonna put a ton of strain through the discs at the back.

Also, the neck and shoulders. So as Mom's in certain positions, you'll see that the neck is gonna come forward. So that forward neck and head posture that we see so often because of all the devices and smart devices that we're on, we see that kind of device neck, you'll see that too with child-care-related tasks. So educating mom on keeping the head and neck at midline and not bend forward, keeping the shoulders relaxed and away from the ears, not elevated up towards the ears, and definitely keeping the shoulder blades level and retracted. So important because that forward-curved spine is going to lead to those scapula protracting and we really need to pull them back for good posture into retraction. So in terms of spine position when feeding, again, trying to get Mom comfortable before the baby latches or before you give baby the bottle. So helping her choose the right place to feed, the comfortable seat, considering if a footrest would help, helping to maintain that lumbar curve of the spine and sitting, and avoiding that forward cervical neck flexion. And then thinking about pelvic tilt when sitting, neutral to anterior pelvic tilt is gonna help maintain all those good curves. So
getting Mom positioned well during feeding, I think, is really important in addition to how she positions her upper extremity holding the baby.

With floor play, a lot of time is spent on the floor with babies and toddlers. It’s just where a lot of play happens, tummy time, and all that good stuff. But making sure that Mom’s in a good position. So you can see the picture on the left, Mom’s really in that forward curved position, sitting on the floor with her child. So she’s not keeping the good curve. So if you can see on the right-hand side, getting Mom in a better position is going to maintain that lumbar curve, put her in that anterior pelvic tilt a little bit will help, avoiding cervical neck flexion during the activity, and if you can see in this picture, you could just tell Mom to move over and sit with her back against the crib. So you can have a support in place there. So if there’s a back support available, use it. So just changing Mom’s position and saying, hi, you sit next to the crib, that way you can lean back against it, take some stress off, have some spine support, and that would really help. This is also a great time for Mom stretch. So as you’re sitting on the floor playing with baby, do some scapula retraction stretches, do some neck stretches, some pelvic tilt stretches, and things like that.

When picking up an object or lifting, it’s not just picking up baby but definitely picking up baby is one of the things, but picking up all the equipment, picking up toys. So anything Mom’s picking up, make sure that she’s close to that object. So gets close to baby, gets close to whatever she’s picking up. Face that object head on to avoid trunk flexion, bend at the knees, so you can keep a neutral spine instead of curving over the spine. You can see in this top picture, Mom’s just bending over, you can see there’s not very much knee flexion there, but there’s a lot of trunk flexion to pick up the book. Whereas in the bottom picture, you can see there’s a lot more knee flexion. So she’s doing a lot more flexion at the hips and knees, and not using the back, keeping those curves of the spine. Other suggestions, keeping a wide base of support, keeping the heels down, and avoid combining movements of rotation. So those are all suggestions.
for picking up and lifting those objects, which most of the time, or a lot of the time, the objects are the child.

So what leads to musculoskeletal disorders when lifting? This is a great article out of New Zealand by Vincent & Hocking in 2012. They looked at 25 mothers who were lifting children between 21 and 30 pounds, and those moms were complaining the most again of low back pain. So 64% of them reporting that low back pain was an issue and this was occurring during bending, squatting, stooping, and lifting. Those were all reported as stressful with bending or carrying something the most stressful. Factors that were going into what could lead to a musculoskeletal disorder of lifting were the child’s weight, how Mom was gripping them, what equipment was being used, the space constraints, and the strength and fitness of Mom. Also, the reach distance. So was it a horizontal reach, a vertical reach? Was it an above-the-shoulder reach or below-the-mid-thigh reach? Was there trunk rotation that was being used? Did they have to bend and lift at the same time? But basically, bending while carrying the child was twice as stressful in their ratings as anything else. So these are really good things to factor in and think about with lifting.

Holding and carrying the baby. There was this really great study about, it was 227 nursing mothers, but this was done in Nigeria. So it was zero to two-year-olds and the common way to lift and hold and carry baby in Nigeria is a back carry. So they were seeing that moms were starting to have difficulty and complaints with that, and they felt like there was a need to introduce the appropriate ergonomic training and interventions on infant-carrying tasks in order to improve musculoskeletal health during childbearing years and beyond. And I think that’s a really great quote to use but what they looked at was the burden of carrying in the arms versus using devices, different carrying devices. So they studied the back carry, the side carry, carrying the baby in the front just in their arms, and carrying in the front with a device, and they were considering the biomechanical impact of each carry. So what they looked at was
studies for the back carry because that’s the most common method of African women. They connected this to studies of soldiers who carried their backpacks, and what happened to their posture because of that. So what it results in was a forward lean of the trunk to counter their center of mass shift that’s in the back. But if you’re gonna carry in the front, you’re gonna load the trunk anteriorly so you’re shift is gonna come forward and to compensate for stability and balance, you’re gonna hyper extend the spine and increase that lumbar curve, make a more posterior pelvic tilt to counterbalance that. So they’re really looking at educating Mom in really good practices of postures when holding and carrying the baby.

One area I hear is a complaint a lot is the car seat. So risk factors with putting baby in and out of a car seat, whether they’re forward-facing, backward-facing, whether you’re using the infant carrier or not, is that a lot of moms are gonna do this with a lift-and-twist movement. So lift up and twist to put baby into the car seat, or child in the car seat. Also, you’re working within a real tight space in the back seat of a car, and another complaint is the amount of pinch strength that Mom needs to undo the buckles. Thank goodness that you need that pinch strength 'cause you certainly don’t want your child undoing the buckles mid ride, but that pinch strength is also a strain on Mom’s thumbs and hands. Excuse me. So some recommendations that I have for the car seat include definitely if your child is old enough and independent enough, and you’re comfortable with it, have them climb in the car. So if you have a child climb into the car themselves, it gives them a sense of independence, it takes the musculoskeletal strain off of Mom and they can climb up into that car seat. But that’s not always an option, I totally get that. So one of the things that I like to teach is if the child can stand is have them stand and lift them into the car in the position that you’re going to put them into the seat. That’s going to avoid that lift and twist. So if you can see in the picture on the bottom left, Mom has kneeled down to pick up the child in the position he’s going to go in car seat. She lifts him up with good posture, of course. He’s already in position so there’s no turn, there’s no twist that’s needed there, and
then the child can go right into the seat. So I find that that's a really good option to teach. And then also there's plenty of commercial buckle-release devices. So if you just kind of search for these different buckle-release devices, they have them, I've recommended them already to moms to see if that's gonna help because they'll complain about the thumb, how hard it is to push the thumb to release that car seat. But if you look up buckle-release devices, they're out there, they're inexpensive, and then you can try different ones out and see which ones you like that you think are helpful.

So in addition with preparation for this kind of idea of good posture and getting healthy in the postnatal period, teaching Mom kind of some different stretches that are useful is really, can make her feel more healthy and help with some of the back pain and a different approach to pain as well. So low back stretches, just having Mom, she's gonna be on the floor anyway playing with baby, right? Have her lie on her back, bring her knees into her chest to release some of the tension through the back. You can definitely do this along with baby or hold baby on your belly while you're doing it, lots of fun things you can do to integrate stretching with baby. With shoulders, doing shoulder shrugs up and down, shoulder rolls forward and backward. For the upper back, definitely look at scapula retraction, pulling the shoulder blades together and then really pushing them apart. For the neck, all of the motions that the neck does. So up-down, stretching, left-right stretching, ear-to-shoulder, chin-neck protraction and retraction as well. Then for the wrists, not a whole lot of great stretches, I don't think, for the rest of the upper extremity. There’s lots of good back stretches and neck stretches. You can definitely teach prayer stretch and the extensor wad stretch of the wrist, like a tennis elbow stretching to loosen up those areas. And then the cat-cow stretch, so the cat stretch, getting down on all fours and kind of arching the back like a cat, and then relaxing down. So I think that’s just kind of a good starting list for stretching as well.
For strengthening, this was a neat study about strengthening. It came out of India, which again, has a kind of neat cultural idea here that in India, moms are going to have the culture of a 45-day sitting month. So after baby’s born, Mom gets to rest, take care of the baby still but do a lot of resting. And this study was led by a nurse in India that looked at should we be exercising postnatally and what benefits that would bring. So of course it’s gonna bring benefits. So she had 84 mothers start exercising right after the baby was born, and they reported less back pain at 45 days. They had regained some of their pre-pregnancy muscle tone, they had improved bladder control, they were on walking programs, better ab strength, and things like that. So there was a definite benefit there to the new moms starting to exercise earlier. So starting a gentle strengthening program I think is a really good idea as well. Again, this would have to be with the caveat of that it’s approved by their physician. But some things that you can look into for a good beginning strengthening program is doing some transverse abdominis work. So the TA is definitely one of those deep core muscles, not going to catch that with a crunch. So there’s good transverse abdominis exercises having to do with breathing and contracting the core muscles which also is gonna help engage the pelvic floor and there’s definitely specific pelvic floor exercises that Mom can start on early. Consider doing some strengthening of the postural muscles of the back. Like I said, the scapular retraction muscles, traps, and things like that.

And then upper extremity strengthening is important, but without stressing the wrist and thumb. So I did a lot of exercising after my kids were born and I would use exercise videos and things like that that were for moms after giving birth, but none of them took into account how the wrist and thumb should be positioned when doing different floor work, when using weights and things like that. So really talking about how to keep the thumb and wrist safe while doing upper extremity strengthening I think is important. And then there was suggestions from another study in 2012 which was interesting because it looked at exercise postnatally, which was really awesome, and it gave some ideas about how to look at exercise. So if you’re talking with Mom and
talking about her feelings around exercise and maybe barriers to exercising, have her start keeping track of her exercises. And if she's not doing them, write down why she's not doing them 'cause it might make her feel better about why she's not doing them. There might be a really good reason why she didn't exercise that day. And so psychosocially that would help. And then recording discomfort during exercise so you knew kind of when things were uncomfortable for her. Then having her assess if she's feeling improvement, if she's feeling the same or feeling worse. And then her feelings before and after exercise. So this is kind of one of those holistic approaches. Let's not just exercise because it's physically a good thing to do, but look at how Mom's doing mentally as well and feelings around exercise. And then another really cool suggestion of the study was every time Mom changes a diaper, this might be a cue for her to do a stretch or do a breathing exercise, or do kind of that cue that's gonna happen throughout her day anyway, use that as a cue to do something healthy for herself as well.

So looking at a summary of suggestions here. Looking at Mom's grip and wrist position for those awkward postures, so the positioning and other biomechanical risk factors. Look at not just Mom but the environment that she's in. So the height of objects, how she has to reach and where she has to reach for things, how things are arranged. Looking at decreasing the frequency of how she lifts, holds, and carries and teach her the right way to lift, hold, and carry. So one of those things that I said about within the car seat, encouraging independence. So if that child is getting a little bit older, a little bit heavier, and you can encourage independence, having the child do some of that, you come to me so I can lift you. I'm not gonna run after you and lift you up to get into the crib, you come to me at the crib and I'm going to lift you in, and not have to carry you there. Also getting help when available, certainly is a good option, and then getting cooperation from the child. So not always gonna happen, I totally get that. But if you can get the child to cooperate with you, that can be really useful. So for instance, when the child is in the crib, that they're not gonna go hide in that one corner of the crib so
Mom has to reach in and lift and pull him or her out, but wait till the child comes over to you at the crib and then lift up from there. And then decreasing the stress and strain of the task. Looking at ways to do that and maybe one of those ways is considering the mood and behavior of the child. So wait till the right moment to pick up the baby, not when they're in the middle of running all over the place or having a little bit of a meltdown. Again, I know that's not always possible. But having Mom think about taking a few minutes, that maybe it's an easier task for her if she just waits out the child till that behavior is a little bit better. Then stretching throughout the day, have Mom stretch throughout out the day, and maybe help her start with a gentle strengthening program in preparation for these child-care tasks that really looks at those postural muscles that she's going to be using.

So overwhelming, right? So if you guys are thinking, well, that's a lot of information, it is a lot of information. Mom does a lot throughout her day, there's a lot of demands placed on her, so it might be really overwhelming for Mom to come in and you're gonna say, oh, you have to do this, this, this, and this. So maybe just have her start with one thing. So starting with one change can be big in terms of leading to other changes and having Mom feel better. So maybe you're just gonna start with some posture activities, or maybe if the thumb and wrist pain is what is really bothering her, just start with some of the simple education about how to hold her thumb and wrist to reduce those biomechanical risk factors. So start it with one area to look at to change and implement and go from there. So pick one piece of this puzzle and help Mom and then build off of that. So there's a good reference list at the end of this presentation if you wanna look through that, a lot of things that I was talking about. But otherwise, I think we're at a good time here that I can open it up if you have any questions.

- [Fawn] Thank you, Sara. I'm going to give a few minutes for people to write in their comments. Thank you for a great talk, I appreciate it. In raising your three boys, did you find yourself using many of these ideas and suggestions?
- [Sara] I do, so that's my three-year-old getting in and out of the car seat, and as he gets older, and things change 'cause as they were little and babies, they need a lot of support because they can't do it themselves. But as they get older and they can support themselves a lot better, then you find out wow, they're really getting heavy. So how you have to kind of move along with their growth and how you lift and hold and carry and what you're doing with them, it just really changes, especially in those first three years. And I think that we can do a lot with helping moms navigate that.

- [Fawn] Okay, here's our first question from Dana. "What types of diaper bags do you suggest? And any suggestions for carrying them with a baby?"

- [Sara] So diaper bags, that's an interesting question. Thinking about how you would want to, and it's kind of the same thing about what we do with kids with their backpacks, pack it light, wear it right, like the AOTA does with their Backpack Awareness Day. Thinking about what strains that's gonna put on Mom, so I personally would like a backpack approach 'cause it's going to distribute better how Mom is going to be able to take on that. Rather than over one shoulder which could be slipping off, or is going to put strain on one side versus the other. It's gonna result in trunk rotation to that side, and then if the diaper bag's on one side, baby's gonna be carried on the other side and I think that you want more freedom with how you carry baby and that's going to reduce that. So I would say a backpack, I would recommend that, and then making sure you're applying those same principles that we would for children with their backpack about how it's packed, where the weight is gonna fall, padded shoulder straps, and that good stuff. So was there a second part of that question? I saw that it's gone now but, in terms of what kind of diaper bag--

- [Fawn] That is all I saw
- [Sara] Okay, great.

- [Fawn] Yes, oh, I think it was what kind and how to wear it, so I think you did cover both of those pieces.

- [Sara] Okay.

- [Fawn] And then here is another one. "Any advice on carrying the carrier?" The car carrier.

- Yes, so, oh, carrying the car carrier, the infant carrier? I've seen some really funky things out there about different ways to hold it and carry it. I would just say that avoiding completely carrying it right in the antecubital fossa, right in the space of the elbow, just because of the structures that are there that could be strained. And so I guess my suggestion is you can carry it in there as long as you're not compressing anything because that's gonna use bigger muscles. But if you can hold it down at your side, then that's also gonna put strain on that extensor wad through the arm. So I don't have one good way, but maybe kind of breaking up how you carry that, switching arms with that, not holding it more distally but holding it more proximally, so closer to the elbow I think is important. But I've definitely seen some little videos out there on different recommendations on how to carry that infant carrier. And just considering again--

- Thank you, I don't see anymore--

- What you think-- Okay.

- [Fawn] Go ahead, go ahead, sorry, finish your thought.
- [Sara] I was just gonna say just yeah, considering what you could be compressing and what muscles are working and trying to use the bigger muscles and avoid compression of any of the structures.

- [Fawn] Thank you, I don't see anymore questions at this time so we'll go ahead and close the classroom. She has provided her email, so please feel free to reach out later if you think of another question. Thanks so much, Sara.

- [Sara] Thank you.

- [Fawn] I hope everyone has a great rest of the day. You join us again on Continued and occupationaltherapy.com. Thank you.