Gymnastics stretching exercises pdf

Note readers - This guide to gymnastics flexibility is a very long and in-depth blog post. The first few sections of this blog are the background and explanation of the flexibility of methods using research. There is a lot of medical and scientific nerdiness out there. If you're not into that and are just looking for a certain area of the body without geeky things, please click the content table below to move on to a specific section. Key points of gymnastics requires a significant amount of flexibility and mobility, making it a core area of training It can be very confusing and easily overwhelming, especially with a rapid increase in scientific advances and online anyone who works with gymnasts should have an understanding of basic anatomy and physiology before assigning flexibility exercises Although studies seem to be contradictory and mechanical reasons why regular exercise flexibility increases range of motion It is important that it is very important that proper techniques are used to reduce joint stress and shift stretching of soft tissue structures, especially in hypermobile athletes Static stretching plays a role in gymnastics, but should be used correctly and at the right dosage. Other forms of stretching like PNF, dynamic stretching, and others seem to be effective when regularly done consistency over intensity is a key concept everyone in gymnastics should follow although studies of contradictory, self-soft tissue care as seen with foam rolling and other tools may play a role in reducing perceived soreness and increasing blood flow to the muscles. There are many other important tools such as proper strength training, eccentrics, workload management, and regular work mobility that need to be considered and used, and as they are supported by the Studies Movement Assessment are essential for seeing progress with flexibility screening, soft tissue care, stretching, work strength, eccentrics, and gymnastics specific exercises should be used in flexibility programs Introduction there are several topics who are regularly at the center of the conversation. Drilling progressions for skills, strength and conditioning, fear management, and dealing with pain or injury are among the most talked about. However, in my twenty-five years of being a gymnast, gymnastics coach, and sports physiotherapist who treats hundreds of gymnasts a year, the flexibility to date is what I get the most questions about. Gymnastics requires considerable flexibility for skills that need to be done properly and safely. It is also one of the main components of scoring, which the judges evaluate during the competition. If not regularly Properly trained, flexibility can become something that really deters an athlete from progressing in skills or possibly contributing to an increased injury injury Between coaching, treatment, and consulting in gymnastics around the world, offering tips on flexibility has become a staple in my work. The problem is between the huge amount of information on the Internet, the rapid development of scientific literature, and a wide range of possible reasons why someone struggles with flexibility, it can be absolutely tiring to learn and use to almost actually see long-term results in gy. I meet a lot of well-intentioned gymnastics coaches and parents who are just looking for an easy-to-use but scientifically supported flexibility program to help gymnasts they know to increase their flexibility, reduce their risk of injury, and increase their performance. Many of them tell me that they try to search the internet, go to clinics or camps, and ask around in gyms on how to help, only to become greatly overwhelmed. They try videos from the internet, disciplined about stretching in practice and at home, do active flexibility, try different medical professionals, and all kinds of home remedies, just to come up short. They tell me that they often fold find temporary progress, but nothing seems to stick to the long term and actually show up in their skills. By the end of a few months, they usually just throw their hands up and say he/she's just inflexible, they have bad genetics. Unfortunately, this leaves the gymnast feeling very defeated, as if there is something wrong with them, not to mention still struggling with skills and possibly at increased risk of injury. Hip and shoulder flexibility limitations are a major contribution I see clinically to the wrist, elbow, shoulder, lower back, and hip injuries in gymnasts. Why do so many gymnasts struggle even when they stretch daily? While genetics and luck play a bit of a role when it comes to flexibility, in general I tend to disagree that these are the main reasons thousands of gymnasts struggle with flexibility, especially in the hip and shoulder joint. It is my opinion that sports gymnastics has yet to use a systematic, individual, scientifically based system for flexibility in learning methods. And I'm not on the hook here. As a junior coach and doctor, I absolutely don't study enough and use proper flexibility techniques. Seeing so many gymnasts, I worked with wrestling, and to be honest, suffering from excessive trauma, I knew that something had to change. I have dived my head into the scientific literature for 2 years and start playing around with many new techniques in the gym and clinic. Flash forward 7 years from now, with a much greater education to use and over 1000 gymnasts being treated for medical issues. Now I look back at how I trained and trained as a gymnast 10 years ago and I'm blown away with all the things I've done, have not been supported by scientific support. Like many people, I pretty much got my flexibility flexibility of the lessons that my coaches have given me, the advice of other coaches in camps or clinics, and everything I found online through discussion forums. While some were useful, I found that most of them were based on unofficial data, and didn't have really solid grounding in the science of anatomy, physiology, medicine, or strength and conditioning. I'm fortunate that now, having learned from many people and tutorials, I'm really good at coping with concepts that seem to work, and those that don't really tend to make a big difference in the long run. In an attempt to help people, I decided for the first time to take everything I possibly know about gymnastics flexibility and put it in one mega-blog here. Jargon Note - The medical world usually refers to flexibility as the maximum range of joint motion can passively reach, including the length of all structures from joint level to soft tissues and nerve level. Mobility is usually related to the amount of movement someone can actively show on their own. This includes not only passive range, but also strength, active control, technique and many other factors. (18, 38-40) I think it's an important distinction, but because of the cultural norms for gymnastics, I won't super specific to go into medical jargon like these terms and more. Free flexibility resources to download This guide will have a lot of research and scientific references in it, but in an attempt to keep it not as hard to read, I'll foot the way these studies using brackets and include a great link section below. Let's start with some background anatomy, explain the terms and discuss some of the theoretical reasons why some methods of flexibility seem to work. From there I will take a deep dive into some of the cultural issues that exist in gymnastics and then conclude step-by-step flexibility examples for each core area of the body that gymnasts struggle with including shoulders, hips, ankles and wrists. I will then take some important notes on other joints like knees, elbows and spine. I hope this guide can be a place for everyone in gymnastics to find useful information without feeling so frustrated and overwhelmed. Before you kick this off, please keep in mind that I wrote a whole chapter of a book about gymnastics flexibility that you can download and find for free here. It goes to a lot more depth than I'll be in this blog. Anatomy and Theory as well as some of the collaborative material for this blog are taken from this chapter. I also took some of the most effective and popular flexibility schemes I've done for male and female gymnasts and put them in a quick PDF for use in the gym. I call them the 10 minute Gymnastics Flexibility Circuit Finally, I did the Gymnastics Pre-Hab Guide, includes itself Soft tissue work, stretching, and weekly circuitry to help with reducing the risk of injury in gymnasts. It provides a complete guide for male and female gymnasts to use. You can download all three here below and I'll also be sure to share a host of other free resources throughout this blog for people to use at home. Download my new Free10 Minutes Gymnastics Flexibility Chain 4 full of hip and shoulder circuits in PDF front splits, cross-border splits, handstands and pommel horse/parallel bar flexibility Downloadable checklists for use in practice Exercise videos for each exercise included Von Anatomy and Understanding hypermobility I usually begin any discussion that I have with trainers or gymnasts associated with flexibility on some basic anatomy. It is important to recognize that the range of movement of gymnasts' hips, shoulder or other display joints is directly related to their core anatomy. Many structures in the body can affect how much each joint moves. In general, these structures can be combined into passive or active categories, With studies outlining this more specifically for the shoulder (1-5) and hips (5-12) Passive structures include things like bones, ligaments, joint capsules, and the inherent bone alignment we were born with. Active structures are more that people know about gymnastics flexibility techniques: muscles, tendons that attach muscles to bones, and nervous system. These structures and systems tend to have much more room for change through training. As a result, they have more opportunities to positively increase the athlete's total shoulder or hip flexibility. Beighton's testing and references to Laxity capsules in gymnastics sports, the vast majority of athletes who participate have basic natural hypermobility. This concept simply means passive structures like ligaments or joint capsules are usually already very weak, and they can naturally have much less stiffness throughout the body. This is usually checked with the so-called Beyton screening. This screen measures hypermobility by looking at elbow hyperextension, knee hyperextension, ability to touch the floor in the pike stretch, pinky hyperextension, and thumb hyperextension. Some studies have correlated Beight's higher score with an increase in capsular promiscuity, including this study linking Beighton's score to more than 4 to hip capsule weakness (and this study that Bond between shoulder capsule weakness and high score Beightons Beightons The body of each small child has certain unique characteristics that can predispose them to success in certain sports. Naturally, hypermobile children can do well in sports such as gymnastics and baseball. Naturally, tall children can do well in sports such as basketball or volleyball. Naturally, fast kids can do well in football or athletics. Athletes with naturally weak ligaments allow them to get into certain ranges of motion required even for the most basic gymnastics skills. Handstands, beginner jumps or jumps, and introductory ring or parallel bar skills require extreme mobility to perform. This is usually why these gymnasts from a young age enjoy recreational gymnastics. Their hypermobility, along with any major talent or great coaching they get to control this range of motion, allows them to be quite successful at an early age. They can easily perform flexibility exercises, reach tumbling or bar lines, create basic forms of gymnastics and navigate through lower-level skills. This is not always the case, but the vast majority of young gymnasts fall into this category once you move past the recreational level. These children are often discovered through early talent identification and quickly enter competitive team tracks. Coaches notice their flexibility or ability to perform lower-level skills well. These gymnasts usually have natural flexibility, but can struggle to build strength and power during a workout. Coaches understand that with more strength and technique, they can progress quickly in a more structured environment. There are some cases where young children do not have natural hypermobility but are gifted in their body strength abilities. They tend to be more biased in strength or power and less so about their inherent flexibility. These cases are much rarer in gymnastics, but exist. I have worked with many athletes who tend to be tougher, but because of their incredible natural strength, they excel early on in gymnastics. This natural selection type of introduction in gymnastics is an important background concept of training flexibility. Because of the many gymnasts having inherent hypermobility, we do not want to place excessive stress on the ligaments and joint capsules of athletes. Even if a young athlete falls into the category of not naturally hypermobile but powerful, we still have to gravitate away from putting excessive loads on passive structures like bones, joint capsules, and ligaments. This is one of the quickest ways to increase the risk of injury over time and slow down progress in the progression of skills. Without an in-depth medical background to understand human anatomy, the risk of rewarding trying to stretch the ligaments and the joint capsules is incredibly high. There are cases where the mobilization of these passive structures is appropriate (after surgery or some other injury). However, however, requires very specialized medical training and must be performed by a doctor who is competent. (13-14) We all need to understand and apply the best available science for hip and shoulder research to avoid over-loading on the passive structures of gymnasts. Without this knowledge, it is impossible to know whether the recorded discomfort during stretching is a safe and expected result or an unsafe atypical response. The reality of training flexibility there will be some discomfort that is associated with it. This is the expected part of trying to gain flexibility, to a certain extent. However, there is a very fine line between reasonable discomfort and real pain. There is also a very fine line between stretching the correct active structure to see improvement and overly emphasizing the wrong passive structure to cause injury. I generally recommend that not stretch have more intensity than 3 or 4 out of 10 (0 no discomfort, 10 is extreme discomfort). Along with this, no shoulder sprain produces excessive soreness longer than at the end of the day, as prolonged soreness may indicate microtase damage. There are very predictable stretch areas of discomfort that athletes may feel, and other areas that are warning signs of more serious injuries. Stretching the hamstring usually produces discomfort in the middle of the back of the thigh rather than high in the buttocks, where the hamstring is attached to an open growth plate in the pre-biebertate gymnasts. Stretching shoulders overhead usually produces discomfort in the armpits where the lats and teres are basic, with some possible chest tissue stretching where the jabs. They should not produce discomfort at the top of the shoulders, which is mostly indicative of a rotator cuff or soft tissue encroaching under the coracoacromial arch. You can read more about hamstring apophysis here (and shoulder encroaching syndromes here (There has been a big spike in hip flexor strains, groin strains, and cranky shoulders that I feel is being very swept under the carpet in gymnastics. This is directly related to this conversation about the need to understand anatomy, as well as active and passive structures, and knowing where discomfort or not is expected. When an athlete reports hip or shoulder pain, too many people jump to the conclusion, and suggesting that these reports of pain just pulled the muscles. They say not to worry about it, and that is something that can be trained to the end. Although this happens in gymnastics, there are many times when it is inaccurate and dangerous. I'm afraid that what many people write off as small strains is actually the beginning of more serious issues like tears, pelvic bone bone fractures, and rotator cuff or biceps tendon damage. Again, without an in-depth knowledge of anatomy, injury mechanisms and medical imaging, it is difficult for someone to tell the difference between a hip flexor and a heavier ligament or laboratory tear. (1, 3, 5, 8-9, 15-16) In the short term, these small flashes of pain may not create huge problems. This may well be a minor strain. Within days of modification, consultation with a qualified doctor, and time to heal, issues can resolve quickly. Sometimes in such a high power of sport, these bumps and bruises are inevitable. However, I've seen these types of snowball problems in huge injuries quickly in the gymnasts I'm treating. I saw what was thought to be a pulled hamstring eventually pelvic plate growth stress fracture, which required six months of time and rehabilitation. I've seen what was thought to be a pain in the shoulders turning into rotator cuff damage and shoulder instability requiring surgery to fix. I've also seen what was considered a hip flexor strain turning into a great lab tear and career-ending injury. I don't mean that every pain report should be in a panic, and that simple muscle strains are not commonplace. I hope to stress more that assuming current pain reports don't matter much and can be trained through rather than thinking critically about the situation can be very problematic. With this said, allows you to consider some basic anatomy. The shoulder anatomy of the shoulder joint itself can be seen as a golf ball sitting on the tee. A golf ball (a ball made of shoulder bone or shoulder bone) is inherently larger than a tee (shoulder connector or glenoid fossa). (2, 5) The bones themselves, and the shape/fit of these bones are often referred to as the first layer of the shoulder joint. This creates a huge range of mobility for the shoulder joint, but in exchange for inherently less stability. This is in contrast to the hip joint, which due to the presence of a deeper hip socket (remember, the hips are built for the carriers while the shoulders are not) has more inherent stability with less mobility. Surrounding the ball and shoulder socket is what is called a joint capsule as well as ligaments. The capsule resembles a ball-like structure that completely surrounds the shoulder joint and serves as a thickened mixing of ligaments. (3) For geeks, as I read, they are more specifically subdivided into the Higher Glenohumeral ligament, the Middle Glenohumeral ligament, the Lower Glenohumeral ligament, and the posterior glenohumeral ligament. (3) Ligaments and joint capsules, along with the alignment of the ball on the socket, create what is known as passive structures or stabilizers. They are also a layer of two shoulder joints. To clarify, many people use sleeve shirts to highlight the joint capsule. If you look down at your arm (and wear a shirt) your actual hand-in-sleeve shirt is the first golf ball on the tee bony layer, and the shirt sleeve surrounding the arm is the second layer, composed of joint capsules and ligaments. This second layer of joint capsule and ligaments helps to ensure greater joint stability, with different parts of the capsule limiting certain ranges of motion. Just like with a sleeve shirt, depending on where your hand is in space, different parts of the sleeve of the shirt are more taught. Research in the last decade has been very insightful to learn about some ligaments and capsule areas that help in preventing the shoulder ball from moving outside the joint and sub-habitation. Going back to the analogy of sleeve shirts, more naturally mobile athletes (gymnasts, baseball players) tend to have baggier sleeve shirts. Other, more natural, tight faces who excel in other sports may have a tighter shirt sleeve. This provides more or less inherent flexibility, but as always, many other factors contribute. This capsule and ligament hypermobility is inherently not bad, as it is part of what makes a gymnast well in the sport. However, as noted in previous chapters, their natural hypermobility can be an area of caution. We want to make sure that we do not over-stretch or overexertion passive structures such as shoulder ligaments and capsules. For many people in the gymnastics community, it all comes down to a professional discussion about taking away overly aggressive methods of flexibility, following the science of shoulder anatomy and making subtle changes in learning. In this regard, due to the gymnast's basic lack of static stability from ligaments and capsules, they will need absolutely untouched strength, physical training and dynamic muscle stability around the joint. It helps to increase strength, power, and reduce the risk of instability-based shoulder injuries. This is where the third layer comes into play, muscular soft tissue. Many people have heard of the muscles of the rotator cuff, biceps, triceps, lats, and so on. It is also very important to remember that the upper back, or thoracic spine, and the next play a huge role in shoulder movement. Restrictions in the flexibility of the thoracic spine can create a situation where the gymnast is unable to get her hands completely above her head or behind her back. It is important for gymnasts to have their pectoral mobility screening to see if this is an issue that I can share in more detail during the circuit sections. Hip Anatomy My thoughts about hip mobility and why we choose certain exercises closely echo my thoughts on shoulder mobility, and I again will not go into greater depth as it was covered in the previous chapter. In the world of hip micro micro laboratory tears, hip fractures and other injuries commonly found in gymnasts have been developing rapidly in the last decade. It was great to see so many great surgeons, medical professionals and power coaches share their thoughts and describe what has yet to be considered. (7-9, 17) I encourage people to immerse themselves in studies of background hip anatomy as well as current thoughts about hip injuries in medical or strength areas. I will offer basic concepts of these in the coming paragraphs as it relates to injuries, but can't stress how valuable the articles or tutorials mentioned have been to me over the past five years. As I did with the shoulder section, here are three graphs that step-by-step guide layer 1 (Bony anatomy) Layer 2 (Ligaments and Capsule) Layer 3 (muscle examples) Parallel shoulder, hip joint consists of a socket (acetabulum) and upper femur (thigh), with a femur protruding as a ball. You may remember the shoulder joint has a very shallow socket that allows a lot of movement but then creates a situation where stability is needed. The hip is a little opposite to this, having a deeper socket with greater congruent joints. This allows for more inherent weight stability, but can limit the natural mobility the hip can achieve. Some naturally flexible gymnasts have bony alignments where the hip socket is not so deep. This creates a situation where the femur has more access to movement in large ranges of motion, creating significantly more hip mobility in all planes. These gymnasts usually don't have to work on flexibility too much to achieve complete splits. They also tend to have excessively mobile hip capsules similar to the shoulder. The hip socket, being too shallow, is called dysplasia. Some gymnasts with dysplasia or hypermobile hip capsules never have pain, but some are still on the continuum of too excessive mobility, which leads to instability and injury. These gymnasts were born this way. This is usually why they were seen as a good candidate for competitive gymnastics, as they naturally had complete splits and bridges. As in the shoulder, the natural mobility of the hip allows them to move through greater movement. As mentioned, we should be careful not to overextend their already hypermobile hip capsules and ligaments during flexibility training. Link below - Microinstabilit hip, does it exist? With this mobility comes a huge need to be strong, have a very good technique, and have exceptional muscle stability. This smaller hip socket and natural hypermobility create a situation where a gymnast cannot have limited dynamic structures for protection. Here the third layer of dynamic stabilizers and muscles comes into play. The gluteal muscles, deep hip rotators, other surrounding hip muscles, and core core necessary for hip safety and performance. It is important to note that some athletes may have different bony morphology of their hips in which their femur or hip joint more rotates forward (anthevert) or back (retrovert). (17) In one situation, a gymnast can have a lot of hip and leg rotation outside, but may not have any foot movement in the other, the gymnast can naturally have a lot of hip and leg rotation in, but doesn't have any moving legs out. A full traffic assessment and something known as Craig's test is the best way to practically assess if a gymnast can fall into one of these categories. (17) Additional radiographic X-rays or advanced medical imaging can also be useful to see bone congruence. Some may have a combination of dysplasia, hip socket rotation, femur rotation, and various pelvic alignments. It's far beyond the scope of this text to break down all these different anatomical variants, but the reader should be aware of the simple fact that not all gymnasts' thighs are the same. Gymnasts who are naturally mobile with very flexible hips are almost always the ones we see used as demonstrators for presentations, clinics, videos online, and during other flexibility negotiations. Which is probably easy for this gymnast to do in video flexibility online because she has unique hips. The same exercise can cause significant pain and limited movement in another gymnast who has a very retrovert or smaller hip joints. Many gymnasts may be limited by their bony alignment, different formed hips, or less mobile capsule/ligaments. It's not always because they're not trying hard enough. Trying to apply one common stretching exercise that the naturally mobile gymnast showed in the presentation can cause some serious problems for such a gymnast. Trying to aggressively push through that bony or ligament restriction will only lead to pain and headaches for all involved. If someone continues to struggle with hip mobility rather than just pushing more to take a step back and consider the concept. Take them to a qualified health care professional for evaluation. Why do gymnasts lose flexibility in the first place? While there are conflicting views on this debate, I welded my thoughts down to three main factors why gymnasts can get tough as they participate in gymnastics. Natural Growth - The most obvious reason is that most people participating in gymnastics are our young children who are not yet fully matured. They tend to gather to varying degrees of growth jerks at different times, which is not entirely due according to their chronological Different gymnasts grow at different times, and often have several large jerks, which are called peak height speeds. During this time, the long bones of the femur, humerus, shin and other Grow significantly faster than muscle tissue can keep up with. This usually results in a limited degree of range of hip, shoulder, ankle and wrist movement because tendons, muscles and nerves that are being stretched are unable to keep up. Many people see this in their athletes when they struggle with flexibility, seem to have difficulties with the skills because of longer limb abortions, and also feel a little awkward during their exercise. It comes a period of adjustment, and there's no big deal other than communicating, changing training as needed, consistent work flexibility, and making sure there's a really great balanced strength and conditioning program in place. Which leads to my second point of an un balanced strength program - At this point in my coaching and consulting gymnastics career, I've been fortunate enough to analyze hundreds of strength and conditioning programs from gyms around the world. This includes non-competitive, competitive, collegiate and internationally elite teams. If there's one thing I can constantly see it's a big imbalance between learning specific muscle groups. Often quads and hip flexors are trained in much greater proportion than the buttocks and hamstrings, as well as the outer rotators of the hip. In the upper body, breasts and lats are trained in much higher proportions than the shoulder blade and upper back, as well as the rotator cuff. It's a theme for a different time, but much of it stems from a stubborn culture that doesn't cover the outside load for gymnasts using weights, dumbbells and barbells. Many of the basic movements using weights or dumbbells such as deadlifting, hip lifts, upper back rowing, and more train these muscle goups very well. When you combine this with a lot of gymnastics specific job formation that a gymnast should do, you can easily create an imbalance around the hip and shoulder joint. I believe that this is the main problem for those athletes who are trying to make long-term progress inflexibility. Even worse, I fear that many gymnasts are being scolded for not having much flexibility when in fact the programs they are part of our treatment of these stability issues with a combination of not balancing power programs and not using scientific evidence for their flexible ability techniques. While there are certainly times when an athlete needs to put more effort into their flexibility or strength program, I think many of us need to be more accountable in the awareness of what perhaps we give to this problem. Adaptation to training - As I said above, gymnastics requires a lot of repetitive movements during training. Many skills, exercises and other technical training parts require same movements over and over again to learn the basics. When you look at other sports, it turns out to be case for many young athletes. There are adaptations in muscular stiffness that are usually associated with repetitive training. Baseball players are known to reduce their overhead flexibility and shoulder internal rotation due to the muscular stiffness of the soft tissues, the more they throw. Many runners report overly stiff calves when they put on hundreds of miles of running for several years. While this hasn't been shown by any gymnastics studies yet, I feel pretty much that just doing gymnastics will expose athletes to repetitive movements that create the stiffness of soft tissues. If they are not tested and will work readily, this can lead to a loss of flexibility. In particular, the internal hips, quad bikes and calf muscles of gymnasts are constantly used to maintain good shape as well as sprint, barrier, impact and create changes in shape. In the upper body, lats, teres major, and packets are reused to maintain proper shape, as well as to produce power on the equipment by changing shape. When you combine these three areas, along with already discussing points about not having the best science behind the flexibility of muscle stress techniques and spare joint capsules, it certainly makes sense why gymnasts can struggle with their flexibility. While puberty can have a big negative impact on flexibility, I feel that the cultural norm of gymnasts just automatically gets tougher as they age overexertion. If better flexibility, strength and care for soft tissues were used, I feel that this could have been avoided. Why does flexibility training work? We must always remember that the structures that have the most room for improvement, active structures, should be the focus of training on flexibility. It is the muscles themselves, the small tendons that connect the muscles to the bones, and to a large extent the nervous system. People's main approach to increasing the flexibility of active structures is to stretch regularly. Stretching has been around for decades in gymnastics as well as other sports. Many different thoughts and practices exist in daily training gymnastics. Static stretching, dynamic stretching, active flexibility and stretching PNF (proprioceptive neuromuscular simplification) are several popular methods. Along with this, there is a lot of confusion or misunderstanding about what happens when gymnasts stretch, why it helps to increase range of motion, how much stretching is offered as useful for increasing flexibility, and how to make changes to look into skills. I will be taking a few points to explain the current body of research on stretching, outlining some important studies that have been done. I'll get a little nerdy with mechanisms, but then I will offer a practical application of the type of resume for people to apply in training. In its basic form, stretching involves taking muscle muscle the final range of motion, and holding an elongated state over a period of time. This can occur statically over a period of time (static stretching), using momentum and holding the finitge (dynamic or active stretching), and sometimes with muscle contractions and stretching together (PNF or proprioceptive neuromuscular simplification). Neurological vs. Mechanical Effects stretching A large body of research has emerged in the last decade outlining that regular stretching makes increased range of motion within 4-8 weeks, both with changes in muscle tissue and changes in the nervous system as the primary mechanism. (18-26) It appears that a combination of mechanical factors (18, 25, 27-29), as well as neurological factors (18-21, 24, 25-26)) are the reasons why regular stretching increases range of motion. In terms of stretching-induced neurological changes in muscle tissue, most articles theorize that the underlying causes of this include lowering the threshold of stretch marks reflexes in muscles reducing nerve sensitivity that transmit signals of danger (nociceptors) a change in the brain associated with perceived discomfort Possible increases in levels of chemicals that are natural painkillers, like enkeflin, in the body. All of these mechanisms can occur as people stretch consistently over a long period of time. The main articles that support this with this, as they say, there are definitely studies that claim changes in the mechanical properties of the muscles, tendons, and the connection between these structures change overtime with stretching. Most of these articles theorize that the main reasons that stretching increases range of motion include reducing the amount of stiffness or adherence in the muscles (viscosity), although probably the transient increase in the length of the contracting unit in the muscles (sarcomeregenesis), especially if eccentrics are used to increase water content, blood flow and temperature in the muscles acutely main articles that support this, I really feel that both mechanical and neurological changes occur in the muscles as well as tendons with long-term stretching. However, I believe that most of the effects of stretching come through neurological remedies. It is my opinion that other aspects of physical training, like strength or training skills, cause more structural changes in muscle tissue due to their higher strength and volume of nature. Especially in gymnasts, changes in nerve sensitivity that transmit pain, as well as reduced stretch marks, are probably the main mechanisms. I think that by using proper stretching consistently over time (not in excessive pain or passive damage combined with a force in full range of motion. eccentrics, or learning skills, mostly causes changes in the muscle tissue itself. Research definitely leaning towards changes in the nervous system is the main cause, especially in the short term. However, there are certainly changes in muscle stiffness as well as muscle length, again when properly used stretching techniques are used. By that I mean those based on proper evaluation, which does not cause excessive pain, which has consistency over the intensity of thinking, and uses stretching as once a piece of a larger program for flexibility. All studies that have shown a change in range of motion from different methods (static stretching, type PNF, more dynamic stretching) do not push subjects into very severe pain or use excessively long periods of stretching the last 2 minutes. In the study of Ben and Harvey (9), thirty healthy adults were compared to 30 people in the matched control group to see if regular hamstring sprains would 1) improve range of motion and 2) alter the sprain of the hamstring. It was found that thirty minutes under the observation of a hamstring sprain to the point of discomfort, five days a week for six weeks improved the overall range of motion, but did not increase muscle stretch. In simple terminology, this means that they show an increase in range of motion, but not because of significant changes in the structural length of muscle tissue. The researchers suggested that the change in the range of motion may mostly come from increased tolerances to nerve fiber discomfort that detect stretch pain, as fibers have been more desensitized. (10) In another study by Conrad (10), twenty-five adults were compared to twenty-four adults in the control group to see if the six-week calf stretching program would 1) increase the range of ankle movement and 2) alter the properties of calf muscle tissue. Twenty-five individuals in the experimental group stretched their calves in the standard protocol with four sets of thirty-second calfs stretching to the point of tolerable discomfort, five days a week, for six weeks. Wall ankle flexibility tests have been used to measure range movement changes, and ultrasonic imaging has been used to look at changes in muscle tissue that refer to flexibility like passive resistive torque, muscle stiffness, tendon stiffness, fascicle length, and penta angle. As in the study above, it was found that while the ankle range of motion did improve, there were no significant changes in muscle stretching results that would indicate tissue changes. The authors concluded that the increased range of motion could not be structural changes in the muscle-tendon unit and probably due to increased tolerance to sprains, possibly due to adaptation in the nociceptive nerve endings. A very useful review of research on the topic was carried out Weppler and Magnusson titled Increased Muscle Intensity: The issue of increasing length or changing sensations? They examine the abundance of studies like the two noted above, dissecting the results and the validity of suggesting thoughts on what stretching does for muscle tissue. While I urge people to consider it and read the evidence for themselves, their thoughts follow in accordance with the ideas noted above related to changes in sensation or tolerance stretching rather than true changes in muscle tissue. In their final paragraphs, they write: Traditionally, the rehabilitative literature explains the increase in muscle sprain observed after stretching, a mechanical increase in muscle length. A growing body of research disproves these mechanical theories, suggesting instead that in subjects that are imptom, an increase in muscle stretching is observed immediately after one stretching session, and after short-term (3-8 weeks) stretching regimes is mainly due to changes in the subject's sensation. (18) There are certainly methodological issues that need to be taken into account in all of these studies. The subjects were adults, stretching techniques and results may have some validity errors, and differences in natural hypermobility or anatomy were not discussed. Gymnasts take part in stretching every day for months on end, so we can't conclude that changes in muscle tissue over time don't occur. Other researchers are fighting these ideas and say that effects locally in muscles like water hydration levels, changes in muscle viscosity, and even interesting ideas down to changing stem cells within tendentious structures may be factors. In the study of Solnner et al(17), the researchers looked more at changes in muscle tissue when chronic stretching was used in simulated animal models. These studies mainly look at chronic immobilization, such as when people unfortunately need limb extension or tendon lengthening procedures. Using very complex mathematical models, they show evidence of a mechanistic multi-scale model for stretching induced sarcomeregenesis, in which chronic muscle lengthening is characterized through a scale of a valued internal variable, a serious number of sarcomamas. This suggests that with significant immobilization or time, puffing in prolonged tension, sarcomeregensis can occur in the muscles. But, the timiing protocols for these studies have been insanely larger than that of the person doing, so this is probably not the main case for increasing muscle length. This is countered by a possible sarcomeregenz, which can be caused by large eccentric load movements. Another study by Conrad and (29) took thirty healthy men aged about 21 and subjected them to 4 sets of 30 second calf stretches. Half of the group performed static segments, while the other half half Keep Relax Stretching, various PNF. They measured the range of ankle movement and stiffness of the end range before and after these segments. They ended up finding changes in range of motion for both groups, with large changes in the stiffness of the tendon muscles in the Hold Relax group. They concluded: ... that both Hold Relax stretching and static stretching can increase the final range of motion, which can be due to reduced muscle stiffness and altered stretch tolerance during application stretching. Also, compared to static stretching, hold relax stretching can have a big impact on changing tolerance to stretching rather than reducing muscle stiffness. The important point here is that we must remember that changes in flexibility occur because of slow, consistent and patient application in learning. Regular use of the right flexibility exercises, progression skills, and strength training assignments based on individual motion evaluation is by far the best way to ensure progress. Long-term changes that have a minimal risk of injury usually do not come from short-term, high-intensity and high-strength techniques often seen in gymnastics. Why we need to change some areas for safety Proper assessments and specific stretching techniques should be used so that excessive stress on passive tissues like bones, ligaments and joint capsules are avoided. The unjustified strength of these passive structures becomes problematic over time as the high strength of gymnastics can lead to injuries. In sports like gymnastics, where very high forces pass over the shoulder, hip and spine joints at extreme motion ranges, this level of strength can quickly trigger already mobile passive tissues to stretch more. I feel that this naturally happens over time, but is amplified when stretching techniques are misled. When this has acquired excess in joint weakness coupled with lack of strength, lack of technical development, high repetition, and fatigue in not fully matured athletes, it can have a number of negative effects. If the ligaments and joint capsules are already hypermobile, and have problems with high strength, then we add more weakness to them over time, we are probably asking for disaster against instability based on shoulder and hip injuries. This is especially true because recent studies have shown that shoulder and hip injuries are one of the most common problems faced by all gymnasts. (25) Much of the changes in gymnastics to prevent these common injuries comes down to the application of anatomy studies, as well as stretching and updating widely used techniques that cannot fall according to the literature. that we want to focus on active muscle tissue rather than passive ligament or joint capsule tissue. We also do not want to cause excessive irritation of soft tissues through bone compression. Common shoulder stretching concern Is one example will be replacing the widely used shoulder stretches for overhead handstand flexibility in training. These areas below are visible daily in gymnastics. As anatomical and biomechanical studies in shoulder outlines (1-5, 16) this end of the range overhead bending and internal rotation position can create excessive pressure on certain shoulder ligaments over time. Specifically, the lower glenohumeral ligament and capsule, as well as possible parts of the middle glenohumeral ligament and capsule. This end of the compression range and increase capsule weakness over time can predispose shoulder instability, subcromial encroaching rotator cuff or biceps tendon, and laboratory damage. I don't mean to say that this shoulder stretch will cause an injury to the gymnast and should never be used. For choreography or specific exercises, it can be very appropriate when not pushed quickly by extreme ranges of motion. Skills like Shaposh releases for gymnasts, tipelts for male gymnasts, and other extreme overhead motion requirements require so much mobility. If used correctly, certain areas in this position can increase the development of skills. However, I want to say that in most cases with gymnast (or many overhead athletes) we are looking to improve the range of motion in this elevated position by increasing the flexibility of specific soft tissues. The tissues most commonly targeted are latissimus dorsi, the main teres, and the peck muscles. When this is the case, there may be a better approach based on the anatomy of the shoulder joint. These common active structures that limit the flexibility of overhead shoulders, we want to focus on making them more mobile. If the exercises are higher shift load on joint capsules and ligaments more times than lats, teres core and peck muscles, we should look for an alternative solution. Another version of the overhead stretch, pictured below, is an example of the opposite. It uses either a floor bar or another version of the arm to shift the outer rotation of the shoulder. The athlete is advised to round the upper back to create an upper leg flexion. The thought process is that, following the anatomy of the shoulder joint and latissimus dorsi, teres major, and pec musculature 62-64, this version of the overhead drill is the flexibility of shifting soft tissue stretching that requires attention and takes pressure often already hypermobile shoulder ligaments. This simple change in stretch, along with follow-up work, tends to make great progress in gymnasts who cannot progress in their overhead flexibility. While on that note, there are a few stretches that really need to be recommended against in gymnastics. I feel extreme passive stretching as these movements really serve little help in the process of safely gaining shoulder flexibility. Although the truth is that male gymnasts need extreme behind-the-back shoulder movement for for horse and pbars, I think it's much better ways to get it than to be conquered with the back stretch. Soft care tissue, specific stretching, and eccentrics can help male gymnasts get where they need to be. I'll dive into this more below. Common hip stretch marks concern is another typical example associated with hip flexibility associated with how arched the gymnast's lower back during hip flexor or

quadriceps muscle stretching. Usually seen a stretch in gymnastics when an athlete's lower back is overly arched, or the pelvis is overly tipped forward, as pictured below. Similar to the shoulder, when you look at the anatomical and biomechanical sciences of the hip joint, hip ligaments, hip flexor and quadriceps muscle (5, 8-12, 17), the more the lower back arched, or hips are tilted forward, the less these muscles can be biased in this stretching alignment. Instead, it can cause ligaments and joint capsules in the front or lower thighs to get more strain. These ligaments are more specifically the medial and lateral arm or the ophemoral ligament and lobofemoral ligament. Parallel to the dots made above, it is not that this area is inherently bad or dangerous for a gymnast. For choreography or specific exercises it can be very appropriate. When used in the right context, it can increase the flexibility needed for advanced jumping or jumping, inbar skills, and tumbling mechanics. The fact is that focusing on the soft tissue of the hip flexor and quad core may be a better approach. An alternative version based on anatomy would smooth out the position of the spine as well as the pelvis and then perform a similar stretch with the main/buttock engagement. It doesn't look nearly as impressive a movement, but it's very specific to the goal we're trying to achieve, affecting active structures while minimizing the excessive load on passive structures. Often available comprehensive studies show some minor changes during training. This can be seen in the examples above. Simple changes to choose types of stretching exercises that offset the correct hip or shoulder structure can make a noticeable difference in long-term flexibility and risk of injury. This can be achieved through a supplement by subtracting the type of approach using alternative exercises or changing the alignment of some common gymnastics stretches. Larger changes to global learning design may be more involved. As with the shoulder, I also feel that extreme methods of stretching the hips with a very high surface, or when the coach aggressively pushes the gymnast, have no place in our sport. I'll talk more about oversplits below, but I feel that the lack of education around this topic is why so many people use aggressive methods. There is a much better way that is safer and has a valid valid followed him for support. What about static stretching? Is it good or bad? Useful or not? I don't want readers to think static stretching is bad and that we shouldn't do that. As stated in the systematic review for 2018 (25), it can have a positive impact on the range of motion when it is done properly. As it also stands out, there may be changes in the tissue over time, as well as neurological changes there are times after a hard exercise or a good day of exercise where I will have gymnasts perform the entire session of soft body tissues and follow it up with a more passive stretching. There is some research that this helps in the supposed recovery process. (36-38) However, the rationale for this is in a different context. In this setting, we are looking to build down the body and help in recovery (known as promoting a parasympathetic tone). We do not seek to build up the body for training or work hard to gain flexibility and learning skills. In my opinion, these are two different applications of static stretching or foam rolling and should be seen as having different goals. Speaking for research on this idea, I think light soft tissue work and static stretching can have the greatest impact on blood flow or lymphatic drainage. This can help reverse the hypoxic or acidic environment that occur during challenging workouts. I will dive into the physiological thoughts on this matter in the chapter of recovery. There is more support in the literature for the use of static and dynamic compression, but I think light self-absorption recovery sessions, light stretching, or even light aerobic exercises are valuable tools along with other methods. Pausing for practical use in Gymnastics Training - I know readers feel real overwhelmed probably. So here are some basic take always to help. The problem is not the use of stretching. The issue is more about the lack of assessments used before and after stretching Lack of flexibility exercises that aim at active muscle structures (muscles and tendons) over passive structures (ligaments and joint capsules) Lack of consistency over the intensity of thinking, which is supported by research, and avoids aggressive methods that can lead to injury lack of individuality and specificity used on the basis of the individual issue of gymnasts piece for overall flexibility that carries changes in the range of motion to the actual skills of current body stretching studies suggests that changes in the nervous system are probably the main reason why stretching overtime increases the range of motion (change in reflex stretching, change of perception Desensitization of specific nerves) Changes in the muscles or tendon tissue itself are also likely to occur (change in the number of sarmers, the length of sarmers, the amount of stiffness in the muscles muscles Static stretching in 30-60 seconds of fights, done 5 times a week, a total of time of 5 minutes per muscle group per week, up to the corresponding limit of discomfort, is supported by most studies to be optimal for increasing the range of motion. It was also pointed out that the total time spent on stretching per week was more important than the total time prolonged for a single session. This article can be found below, but before readers move on to creating only static stretching schemes based on these parameters, please read the rest of this chapter. Thomas E., Bianco A. Palma A. The link between typology of stretching and stretching duration: effect on range of motion. Int J Sports Med. 2018. (Epub ahead of printing) Read this study here - other stretching techniques like active flexibility, and PNF stretching are certainly effective for increasing range of motion. The most effective approach to increased flexibility can be when stretching is used with proper evaluation, consistency in stretching, follow-up work, strength programs including eccentric workouts and proper volume/fatigue management for athletes. Sands and McNeil have some fantastic chapters on flexibility in the recent Force and Conditioning tutorials (39-40). It is worth noting that both authors have a lot of experience in elite level gymnastics, spending most of their careers, studying the biomechanics of gymnastics, injuries and sports results. I am incredibly grateful for all the research they have done. In their chapters, the researchers note that learning flexibility should be viewed in a broader context, outside only to increase the co-range of motion. They explain that the short-term effects, often seen when stretching, must be reinforced by other qualities of athleticism. They spell out exactly what areas such as muscle strength and joint control should be trained in parallel with stretching. They state, like many other great researchers, that properly performed stretching attacks of the 10-30s that move to tolerable discomfort can be effective. They also state that longer stretching durations (say, up to 2 minutes per site) show a decrease in profits. They also echo studies already covering that emphasis, as over-aggressive or excessive stretching durations may possibly have a devastating effect on connective tissue (39) Is foam rolling a waste of time? The most soft fabric work refers to the use of foam rollers, lacrosse balls, tennis balls, or other tools to help massage various muscle areas of the body. It's all become wildly popular in the last five years, and it's starting to show more in the gymnastics community. I think that daily care of soft tissues is one of the important parts of the puzzle. I feel gymnasts should do a regular soft tissue care routine to fight the fight rigidity, which can have a negative impact on flexibility. Some studies have shown that it may also be helpful to reduce perceived muscle soreness, increase blood flow, and have an impact on recovery (41-43) I encourage all athletes that I work with to do some form of light, soft tissue training before each workout. This becomes increasingly important as an athlete gets older, starts learning skills at a higher level, or spending more hours a week in the gym. Body studies regarding foam rolling and manual therapy or massage are a bit confusing with regards to theoretical mechanisms. The most popular thought process is that we influence the tone of resting muscles, possibly increasing blood flow, perhaps by altering the amount of water hydration levels in the muscles or offering a competitive neurological stimulus for muscle soreness. As mentioned above, the study is mostly leaning towards changes in perceived discomfort through neurological mechanisms over changes in muscle tissue, especially in the short term (41-42). Most of the medical professionals that I have spoken to feel the main benefits of self-soft tissue work increase blood flow and allow for muscle relaxation. Given the stuff I read, this was my basic thought process as well. Controversial studies on foam rolling and other soft tissue care There have been conflicting studies on long-term changes in motion range from different stretching techniques as well as self-soft tissue work. There seems to be a short-term change in range of motion, but often don't stay too long without follow-up strength work or consistent practice flexibility. A systematic review by Chris Beardsley and Jacob Skarabot in 2015 outlines (41) that when analyzing various studies, foam roller use appears to lead to a sharp increase in flexibility in most studies, despite several studies not reporting sharp changes in the range of motion following forms of foam roller use. The conflicting results may be related to the types of tools used, the duration of treatment, and the technique or instructions given to the study participants. It is important to note that, after reviewing the literature, it was pointed out that a combination of proper self-ophassional release and targeted static stretching could bring the most beneficial benefits to acute changes in flexibility. Because of the outlined research effects of foam rolling, stick or other forms of self massage, I regularly recommend it as part of a gymnast's flexibility workout. This is by no means an ideal solution, but when based on an assessment And used with other strategies, self-ophastic release can be very useful. I tend to perform moderate pressure, which does not cause pain, for 10-30 seconds on a group of muscles, away from bony areas. This is because a large amount of manual therapy and and Tissue work does not recommend very intense/painful pressure, or very long bouts of foam rolling are needed to get positive benefits. (41-42, 44-45) In my experience, excessive force, excessive duration, and improper placement of a foam roller or stick massager can have opposite effects. It is very important that both coaches, gymnasts and medical professionals understand this study so as not to see negative results from these instruments, or, worse, cause unintended damage. I know some trainers worry that excessive static stretching or foam rolling before exercise can negatively affect strength or power output, based on problems or some research results. (46-48) However, more recent studies have supported the idea that foam rolling and properly designed dynamic warm-ups before workouts do not appear to have a significant negative effect on performance, can enhance it, and positively affect the range of motion in different muscle groups (49-50). From looking at self-myofascial release and manual therapy literature reviews, this is expected to be through changes in perceived soreness, neurological relaxation, and possibly blood flow/water content shifting within the muscle. Again, as presented by Beardsley and Skarbot, the self-myofastic release does not seem to hinder athletic performance sharply or in the short term. The average quality of the studies included in this section of the review was slightly higher than the average quality of the studies included in the review as a whole. In all but two, (Janot et al., 2013; Peacock et al,2014) there was no change in performance measures after any of the SMFR protocols used from all the sciences I read, and the conversations I had with medical professionals on stretching or self-phytoascial work when properly applied the positive effects of foam rolling on performance greatly outweighed the negatives. To support this, my experience with hundreds of gymnasts to increase flexibility also supports the use of regular stretching and foam rolling for range of motion, perceived soreness, and perceived recovery, with minimal negative impact on performance. I recommend using these tools along with full dynamic warm-up and technical exercises commonly seen in gymnastics. I want to emphasize that proper stretching and soft tissue work is not the only way to increase flexibility and performance for gymnasts. This is just one piece of the puzzle that needs to be used in conjunction with the evaluation of movement, strength work, work technique, consistent practice and periodization programs that work-to-rest ratio. These topics are usually what I write and lecture about most, because they are often underrepresented or misunderstood in gymnastics. Science should be combined with the opinion of expert coaching and consistency in learning. Many gymnasts I coach or treat injury injuries That light, soft tissues work makes them feel more heated and helps reduce perceived muscle soreness. They also claim that it helps after heavy workouts or on light training days to recover. Many also claim that it helps them move in a larger range of motion with less discomfort before starting their practice. The few very inflexible gymnasts that I worked with also displayed improvements in hip or shoulder range movement over time when they used soft tissue work combined with proper stretching/strength programs. As a doctor, I regularly perform manual therapy to help with injuries through a full medical examination. Just like with the warm-up concept above, this is just one piece more of the puzzle for increased shoulder or hip flexibility long term. I often see a noticeable change in range of motion during just a few sessions, in anticipation that gymnasts are dedicated to the follow-up home program. Many gymnasts will continue to see me in the competitive season for service, as they may notice how adaptively tough they are getting through a lot of training or competing. My mentors indicated that this was an important part of their work in professional sports throughout the competitive season, so I took this into my practice with gymnasts. It's just an anecdotal experience, but they're in keeping with what the literature outlines. I agree that studies contradict the theoretical mechanisms and effects of soft tissues, but this seems to be making some positive effects that support its use. I know that there is a wide range of positive or negative views on soft tissue work. For me it takes a minimal amount of time and doesn't seem to have too many negative effects when properly implemented. I view it as a tool to open the door for gymnasts to then perform strength, technique and control work for gymnastics skills. My best recommendation is that people become more familiar with research, practice and the use of self-soft tissue work. They can also work with health care providers who understand this information to either train their employees or teach gymnasts themselves. Why motion scores are key to finding the root problem of moving past all this background information, it's time to talk about what actually causes gymnasts' hands not to go over their heads in the rack, gymnast's legs not to go in full split, or gymnast's hands not to go for their body to pommel the swing horse. Many medical evaluations can be used to determine why hip, shoulder Gymnasts' spine may not have the range of movement needed to reach the full handstand, divided, or bridge. The reality of the human body is that there are hundreds of factors associated with anatomy that can affect a gymnast's level of flexibility. There are many possible reasons why a gymnast can or Move their hips to a full split position or move your shoulders over your head in full rack position. Without a proper evaluation of the movement done first, the application of regular stretching and other flexibility exercises may fall away from identifying progress. To make matters worse, if we do not find the root cause of limited flexibility, we may cause additional injury problems. As mentioned, it is important to pick up here to focus on things that we can change as muscles ourselves. Other things are out of the realm of change if you have a medical education. The way someone's hips or shoulders have shape, unique bone rotation, certain anatomical changes, or issues throughout the body circuit, all of this can have a significant impact on the amount of flexibility a gymnast can show during skill. It's not always about the length of the muscles in one place like the hip or shoulder that makes everything go right. The reality of the situation is that the different muscles around the hip or shoulder may be the culprit. Along with this, a lack of strength, limited full range control, technique problems, fatigue, or adjacent areas of the body can be the cause of a apparent lack of flexibility. These questions are usually overlooked as the culprits of why a gymnast is struggling in this field of gymnastics. Without the ability to assess these various factors, it can be very difficult to make progress on flexibility. I encourage people not to automatically push splits or pull their shoulders open when they see a gymnast with a limited range of motion. The components of Splits and Handstand Flexibility Everyone in Gymnastics should understand that there are many split subcomponents, overhead handstand, or behind-the-backs models that need to be worked out. For example: Split's right/left leg - Basic bone anatomy of the hip joint (retro or ante averted femur or acetabulum, Hip depth sockets, bony leg length inconsistency) Basic control and strength of the anterior leg hamstring flexibility of the anterior foot of the groin extensibility front leg calf extensibility Rear leg flexor flexor flexor rear leg of the groin extensibility Rear leg quad-core flexibility of Glute and deep rotation strength on the front leg and quadratus femoris nerve motor control in full range of motion Lack of protective protection against tissue injury Coordinating dynamic stability of the hip and core muscles Overhead shoulder Flexibility Basic bony shoulder anatomy (retro or antenatal shoulder shoulder The nucleus control and strength of Latissimus dorsi muscular flexion Teres major muscular flexion Pectoralis core and minor muscular flexion muscular enlargement of the thoracic spine and rotation of joint mobility Lower cervical rebuttal and rotation mobility Rotator cuff and shoulder blades Forearm and wrist expansion mobility for proper styling thoracic socket nervous compression and expansion motor control in full range of motion Lack of protection from tissue injury Coordinating dynamic stability of the rotator cuff, shoulder blades, and more prime engine muscles I do not mention this long list to make people feel uneducated. I invite them to outline the complexity of the human body, in the hope that people are more careful in some of the flexibility decisions they make. It can be overwhelming if you are not familiar with it. The analogy I use with people from a coaching background is to compare it to a giant swing and the necessary components to complete the skill. In order for a giant to be technically sound, many subcomponents must be present. Proper Giant - Physical training basic formation Ability to create all body tension that optimizes the storage of energy in the bar bending Proper kipping mechanics Proper Mechanics Cast Strut Proper Hollow Shape Fall in Tap Tapping Mechanics Hollow - Kicks The correct time shape changes the finishing hollow position to carry momentum over the bar enough reps to maintain the memory of the technique Just as we have to draw the engineer each of these technical issues why gymnasts are not able to make the giant more, we need to take the same approach to flexibility training. We have to educate ourselves on the fact that the components go into full rack or split positions and then be able to reverse the engineer why the gymnast is struggling. Just doing more splits or pulling your shoulders open with stretches that are a bit extreme, most likely not getting to the cause of the problem. I have found that many of the traditional common stretches we use as a move to methods to increase flexibility do not have proper estimates prior to them or may not have anatomical considerations in mind. Because of this, they may not be the displacement of proper muscle tissue intended and as a result can show limited effectiveness. I'm not saying that all plots or flexibility approaches we use should be discontinued because they are dangerous. I'm just saying there are many factors to consider and that there may be a better approach to take. I see a lot of shoulder stretches, and hips stretches that I feel put a crazy amount of stress on the joint capsules and ligaments. I don't feel like they work as designed to solve the true problem of soft tissue muscle stiffness. By understanding these concepts, people in the gymnastics community can save a significant amount of time as well as reducing the risk of injury during flexible training. The approach to this goes back to the chapter on why an interdisciplinary approach to the future of gymnastics is needed. There are screening tools that can use to assess these issues, in addition to many large estimates that health care providers can use to break down problems. Problems. where we go next. Not feeding fire with strength and fitness With this concept of excessive muscular stiffness in mind, I want to pause at a critical moment. I find many gymnasts who have shoulder injuries or struggle with flexibility show a significant strength deficit within their upper back and scapular area. The muscles of the shoulder blade and upper back are often not as developed as the chest and armpit muscles mentioned above. It is often possible to see many gymnastic strength programs that train a large volume of pull-ups, leg lifts, rope climbs, and push-ups. These programs often don't have the same volume of upper back strength work, such as legs elevated horizontal rows, renegade strings, a band to pull apart, or a basic strengthening of the rotator cuff. I believe that addressing this overall imbalance in strength is key to seeing the long-term benefits of shoulder flexibility and reducing excessive shoulder-related injuries. Exercise choices, balance of strength programs and athlete's individuality also have a significant impact on limited progress in flexibility. If a gymnast is known for having tight shoulders that limits their handstand and swinging skills, why do we continue to have that athlete do a lot of pull-ups, rope climbs, push-ups, and leg lifts? A large number of these movements can lead to constant rigidity in these areas and, as a result, further contribute to the constant loss of mobility overhead. The best option would be to first change the amount of pull up or rope to climb the volume these athletes do, and instead replace these exercises with more horizontal pulling type movements to help create balance. In addition, adding to the regular work of soft tissue and mobility exercises will be very important. This will help them continue to get the effect of strength training, but will not continue to perpetuate their overhead mobility problems. In the long term, the increased strength of the upper back and subsequent work on the technique will solidis up the progress made in the field of flexibility. The same argument can be made for the hips of gymnasts. Many gymnasts struggle with excessively rigid hip flexors, inner hips and quads. They are also usually subject to 100s squats, squat jumps, and foot tigthening exercises per week. It's not that bad, but there has to be an equal amount of hamstring, buttocks, and deep hip external rotator work as well. Many gymnasts with stiff hips could help from a bit less squatting and jumping, and repace those exercises with buttock and hamstring work. Keeping the slider creeps up a great basic replacement training to reduce some of the leg lifts that can create ongoing headaches with flexibility of division. What about warm ups and cool falls? Warm windows and cool falls are another common theme that arises when discussing flexibility. A lot of people want to know that approach, static or dynamic, if they should be aimed at increasing the range of motion, what are the best exercises, and so on. For me, I believe that the discussion should begin with the intended goal of agile work. There are a few cases where we seek to just get the body going, and in other cases when we are looking to really increase the joint range of motion. I'm considering the various goals of fo flexibility in this light, Warm Up - Prepare the available flexibility of athletes, and prepare the body to prepare the Flexibility of the Circuit - Look to increase joint flexibility or mobility through step-by-step circuits (more below) Cool Down - Helping the body slowly ramp up in recovery mdoe after a heavy workout. Normally, there is no time to increase joint movement, since the body is usually in a very high stress state and has just taken a lot of training In my opinion, the warm-up should not actually be the main time we are looking to make a massive change in flexibility. Warm-ups are usually best seen as a time when you can prepare the available joint range of motion that a gymnast has. There are usually large groups of people warming up, a limited amount of space, and a limited amount of time. It should also be remembered that immediately after the warm-up genetically go to the event has very high strength. We do not want to over-relax muscle tissue and increase the number of joint movements before exposing them to extremely high forces. For this reason, I usually approach the warm-up getting the body ready for training. While there are many studies and tutorials of chapters written on these concepts (38-40), I have found that multi-stage warm-up seems to be the best approach for this purpose. I recommend that athletes start with light soft tissue training or separate areas of attention before practice and then make a joint drug based on and then some light cardio to increase metabolic temperature and heart rate, then do a full dynamic workout. After a full dynamic workout, athletes can do some basic basics, jumping and landing basics, a handstand or other gymnastic specific preparatory work, and then progress naturally to their first one. We'll have our gymnasts do a quick 5-10-minute foam roll or light stretch, just to help the body calm down. There are theoretical ideas that we allow the body to move into a parasympathetic state, help clear some of the metabolites and acidic biproducts from learning, and that we allow some more blood flow around the body against just getting out of practice and sitting Car. As for the specific flexibility schemes, the ones I feel is the best time to really make a positive increase in joint flexibility. I'll cover these these Below. Are oversplits bad for gymnasts? After various conversations about flexibility with people in the gymnastics community, safety training over splits is usually the biggest issue. In the most basic sense, I don't think oversplits are inherently bad for gymnasts. I think the more accurate way to describe them is that more splits can be bad for a particular gymnast at that point in time. Some degree of abnormal hip movement may be required for success in aesthetic sports. I think that there are still not studied bone adaptations to the hip joints of gymnasts when properly performed and a consistent stretching occurs in young years. I have this theory based on changes in bone rotation that baseball players exhibit from throwing when younger. This is a central work concept my mentors Mike Reynolds and Lenny Macrin teach their patients about, because of how much it changes their mobility. For example, in this study (recently looked at X-rays from professional ballet dancers during complete cross-border splits. They found that to achieve this full position to saddle the split; there was evidence of micro subluxe in the hip joints. This means that the hip bone has slightly migrated from the hip socket to reach such large ranges of motion. This finding is not inherently dangerous, or good as research always has its own internal problems. More research is needed, but this concept of natural bone adaptation in gymnasts is a central idea I feel will emerge in the future. Research in ballet dancers made me rethink what needs to happen in the hip to go to achieve such large ranges of motion required for oversplits. Although it is purely anecdotal, I have consulted on cases where X-rays show a very similar phenomenon in gymnasts doing oversplits when getting hip X-rays. With that in mind, we should seriously consider the fact that gymnasts have open growth plates and may suffer from apophysis ishial or plate stress plate growth fractures if we blindly force split movement. Forcing a split into extreme oversplit bands without proper evaluation behind it, asking a gymnast to perform more splits when they're not even close to splitting on flat ground, or blindly pushing someone down just to be tough, is most definitely dangerous. The main reason, as mentioned above, is because stretch pain is reported can and comes from several overlapping body structures, some we need to aim at the target (muscles, fascial tissues, some tendentious) and some we should not be (bone joints, ligaments, capsules, lips, etc.). Without an in-depth knowledge of medical evaluations, it is difficult to know why a gymnast can be limited in their split and what structure is referring to discomfort during exercise flexibility. Being able to achieve a complete more split, or even a regular full split for for the issue requires a lot of things to go well in terms of traffic. That's where things start to get important. Some of the movement-based components that need to go straight to perform more splits include: naturally hypermobile-type genetic structure, and shallower hip joints (acetabular dysplasia) Proper spinal control, alignment and awareness that does not stress the lower back or hip joints of excessively adequate muscle length in the hip flexors of the hip joint, quad and groin Adequate muscle strength in the nucleus, buttocks, deep hip stabilizers, and rotator muscles to safely maintain hip joint adequate full control of range and strength for the central nervous system to allow foot movement to occur safely consistent training and regular use of newly acquired movement to transfer movement skills to long-term proper mental and psychological development/maturity of the athlete to actively participate in training to see progress, as you can see, there are quite a few things that can limit why someone can't make a complete split or more split. For a first glance, they can all look like a person who is tough or inflexible. Which brings me to my most important point of this section: Splits and more splits should not be seen as an inalienable thing a gymnast has or doesn't have. It should be seen as a skill with many parts that need to be broken down to succeed. Using proper motion assessments, understanding anatomy, and consistency over the intensity of thinking is something that will reduce the risk of injury and increase gymnastics performance. Now that being told that more divisive training is not inherently dangerous or going to create an injury automatically, we all need to realize there are serious consequences for not approaching split flexibility correctly. I firmly believe that gymnasts should earn the right to do more splits and should be mature enough to make them safe. Just throwing a bunch of random flexibility exercises you recently saw in a clinic or on video (I'm pretty much guilty of that) is a quick way to ask for a hip pain complaint. Also, aggressively pushing a gymnast down in a split or not taking the time to break down why someone is limited can also lead to serious injuries. Before applying new ideas of flexibility, take a step back and consider the scientific justification for them. Also, think about how they apply to the skill profile of a gymnast. Then brainstorm how to divide a group of gymnasts who may or may not and which may need an alternative exercise based on their questions. Lately, many gymnasts have been reporting that hip flexor strains that they are pushing through. However, they can have more serious underlying problems such as ligaments, capsules, joint or laboratory damage, which are frankly a big deal. Many great studies have charted Hip ligaments and labrum can get strained at the very end of the range that are unprotected or re-exposed to high strength (as seen from multiple gymnastics skills). I will say take these studies with distrust because of their methods, smaller sizes and sometimes using corpses as subjects. It's not something we want to freak out every time someone reports discomfort in a split. However, we need to understand that forcibly pushing oversplits without being open to studying basic anatomy, or ignoring serious pain complaints from gymnasts is not tolerable. A blind approach to gymnastics training flexibility can lead to serious hip injuries, as ongoing medical field research has demonstrated. Labor tears can progress by requiring surgical repair and putting an athlete out of training for months or even a career ending. The long-standing instability of the hip microtreach is another problem that can be created without a proper approach to learning. If you are more curious about the medical side of a hip injury in hyper-flexible athletes, I highly recommend reading these articles. Skendersel et al. Approach to evaluation and surgical treatment of mechanical hip pain in a young patient. J Bone Joint Surg Am, 2013 Sep 18; 95 (18): e133 Dumount GD. Hip instability: Current concepts and treatments. Sports Medicine Clinics July 2016Tom 35, Issue 3, Pages 435-447 Weber, et al. Hyperflexive Hip Management hip pain in dancer and gymnast. Sports Health: Multidisciplinary Approach April 23, 2014 Sibata, K.R., Matsuda, S. and Safran, M.R. Is there a clear pattern in the acetabular laboratory and damage to joint cartilage in the non-displastic hip with instability? Knee Surg Sports Injury Arthrosc (2016). doi:10.1007/s00167-016-4342-4 Kalisvaart MM, Safran MR. Hip-instinity exists: etiology, diagnosis and treatment. J Hip Preservation Surg (2015) 2 (2):123-135.doi: 10.1093/jhps/hnv017 Unfortunately, many young gymnasts require hip surgery, or retire due to a hip injury of this nature. In part this may be inevitable for high-level gymnastics, but we must do everything we can to reduce the risk, given the scientific information and coaching experience. Are ankle scales dangerous? The next most common question that people ask me in this debate is: What about ankle weight, is it bad for hip gymnasts? The biggest concern I have with using ankle weights is due to two notions of hip encroaching and hip instability. I feel that this question arises during fast dynamic movements like jumping, kicking exercises, jumping, running, male work, and so on. Anyone who wants a fantastic read and more detailed background on these concepts once again I recommend you read this article: Hip Hyperflexib: Managing Hip Pain in Gymnastics and Dancers. I will try to give simple explanations and include graphics for concepts. Hip impingement refers to the femur and pelvic bones to make contact with each other in extreme ranges of motion, in most cases causing pain and possibly damage to the soft tissues in between. Hip instability refers to the hip moving into the same end ranges of motion without force/control, causing the femur's head to partially slip out of the hip socket. These two things often happen together in very flexible gymnasts, theoretically, as femur contact on the pelvis creates a prop type point for the head of the femur lever against promoting instability. Moving from here, I'll start covering specific joints and ways to help. It will be much less explanation, and more just videos and examples on how to help. This can cause irritation to encroaching tissues, but also excessive strain of soft tissues and hip ligaments/capsules that are being stretched with instability. This can occur with hip flexing movements (think front leg high kick or jump) as the front femur comes into contact with the front of the hip (movement) and then the contact acts as a support for the femur to slip out the back of the hip joint (instability). This can also occur with hip enlargement movements (think back leg kick or jump) as the back of the femur in contact with the back and outer of the pelvis (encroachment) and then the contact acts as a support for the femur to slip out of the front of the hip joint (instability). Now let me tie this up in why I no longer use ankle scales. The ankle is very far from the hip joint. The further the load from the joint, the more strength it will have on it. It is my opinion that using ankle weights under high speed (e.g. in jumping, foot kicking, running, gymnastics skills/exercises) will be very challenging for gymnasts to control because of the long weighted arm lever. Unfortunately, I feel the strain at the end of the limb can contribute to stronger hip encroaches, as well as make a greater contribution to fulcrum-based instability/sub-aging soft tissue sprains and possibly irritating the hip joint. I think this is especially true in those with natural hyperindic hip joints that are not fully developed and lack of hip strength. This may be one of the reasons why so many gymnasts say their hips hurt when they jump exercise, running, or skills with ankle weights on. Again, these are just my thoughts. To really see if this is true, I'll need a dynamic MRI machine, a super slow motion high-definition camera, and someone way more technologically savvy than me (anyone wants to put in Secondly, I have also found that many gymnasts have significantly increased the passive range of motion due to naturally weak, but have a noticeable lack of active control over their full hip hips This is especially true when it does not allow compensation from other parts of the body or excessive swinging impulse. They often struggle quite a bit to lift their legs even against gravity alone. In this situation, if a gymnast can't access their full range of movement against gravity alone, I don't see any reason to add extra ankle weight resistance and allows swinging momentum to reach the desired end range of motion. I feel that this can not only contribute to more compensation, but it can create overload based on muscle and tendon injuries combined with the principles above. Third, at another geekier engine control point I think that using the outer boot away on the ankle joint significantly distorts the movement of the picture the brain is trying to take neurologically. Simply put, I think that ankle weights make the skill very different compared to just the weight of the foot, and not exactly represent/switched to unweighted jumping. Many people say how easy their jumps and skills feel after taking them, but I think it's a short-lived neurological trick that may not have the best long-term transfer. Now please don't take this as I am not an external load fan for gymnasts, as I am a fan of that when properly used (see article here). So, what are some decisions, maybe to move away from aggressive stretching/ankle weight, but still developing a beast like jumping/jumping? I'm glad you asked! Let's dive into some safer and more scientifically supported methods. How to help - Working in complexes against just stretching considering all this, instead of doing twenty to thirty minutes of just stretching exercises, I now feel working in a complex type format is the most profitable approach. I've found that not only can it give rapid changes in flexibility, but it can also make long-term changes that manifest in gymnastics skills. The traditional gymnastics model usually involves twenty to thirty minute periods of time where static areas are held, active flexibility exercises are done, or specific exercises are repeatedly done in large volumes to gain range of motion. I've been doing this for ten years as a gymnast and for the first five years I've been coaching. Knowing what I'm doing now from all of the above studies, I basically moved away from this approach just by using stretching to increase flexibility. This is true both in training and in our medical clinic. One of the most effective methods I've come up with to increase flexibility, make changes to the stick, and no risk of injury with aggressive stretching techniques is to work in complexes rather than perform only static or dynamic stretching. I think these longer static or active flexibility schemes have some significance (and this is supported by research when used correctly), the abundance of research outside of just the literature on stretching offers a more Approach. While these traditional training methods can bring short-term benefits and can help raise an athlete's awareness of the body position, problems clearly exist with this model. On the one hand, proper traffic assessments are rarely done before these large sessions of flexibility. Often the specificity or individuality of specific exercises is lacking as a result. Secondly, in most cases there are no pre-and-post tests (line splits, checking objective shoulder flexibility of the screen against the wall) to see if what is used for exercise is effective. People assume that progress has been made, rather than having some comparative baselines to monitor changes. If the training strategy fails within days or weeks, we need to change and revise our methodology. Finally, passive or active exercises on flexibility alone will not have a significant effect on the nervous system to change movement, build strength, or correct technique. Such an approach could lead to limited transfer of actual skills. This may help improve the range of motion sharply, but it won't change the movement in gymnastics skill in a specific way. Despite our best efforts, we can continue to see cast handstands that don't have open shoulders, jumps that don't have big angles, and parallel bar swings that don't have a big front swing. Because of these reasons and the research that I've read about the human body, there will probably be a very limited long-term change in flexibility that change gymnastics skills. We must remember Dr. Sand's advice to treat flexibility not as static quality, but as a dynamic quality that includes strength, power and control. I feel to see a noticeable long-term change in the range of motion that manifests itself in the gymnastics skills we need to approach the entire motion system with our mobility work, rather than just strive to improve the range of motion seen. As I mentioned above, the studies do support specific stretching and soft tissue work, but as one part to a larger program. That's why I now basically approach flexibility in larger complexes. The complex usually includes these steps (I will offer links to the video below) a preview screen test of Splits on the line, back to the wall overhead shoulder movement, crab positions for male gymnasts to evaluate parallel bars and pommel flexibility Self-Soft Tissue Work Soft Tissue Prep 30-60 seconds on target muscle group, no more than 5/10 discomfort level targeted muscular stretching, or PNF Techniques hip Flexors, Lats, Teres Major, Peck Major and Small, Thoracic Spine, etc. etc. gymnastics stretching exercises pdf. rhythmic gymnastics stretching exercises. stretching exercises for flexibility gymnastics. back stretching exercises for gymnastics. dynamic stretching exercises for gymnastics. doing gymnastics stretching exercises

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