Ergonomics Research Techniques

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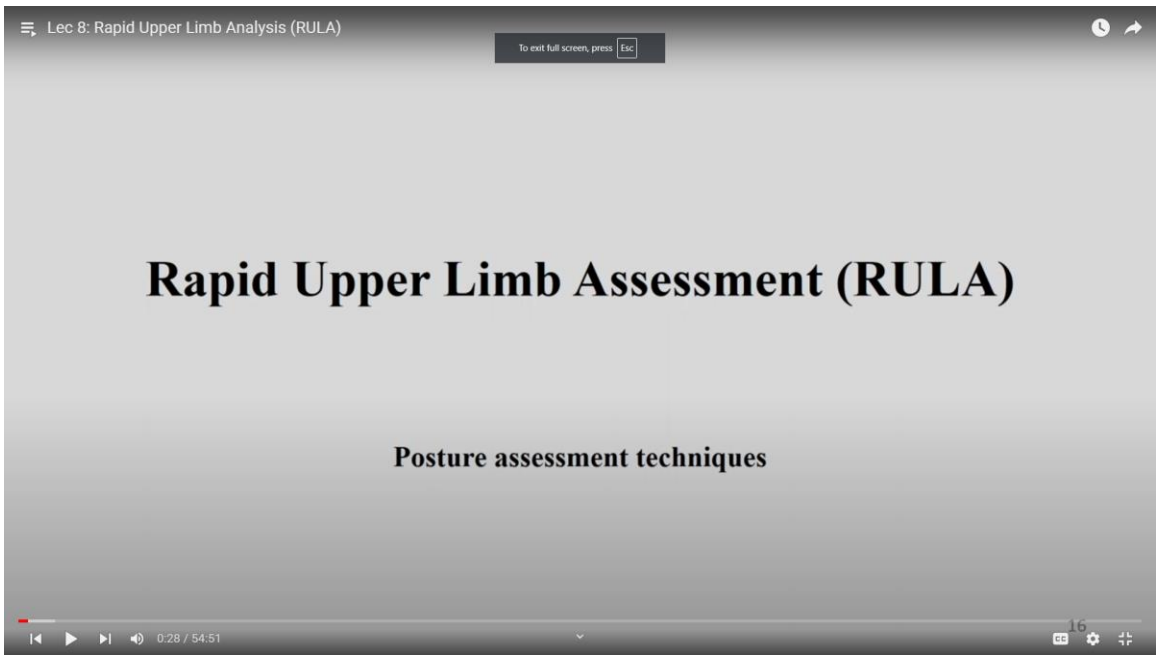
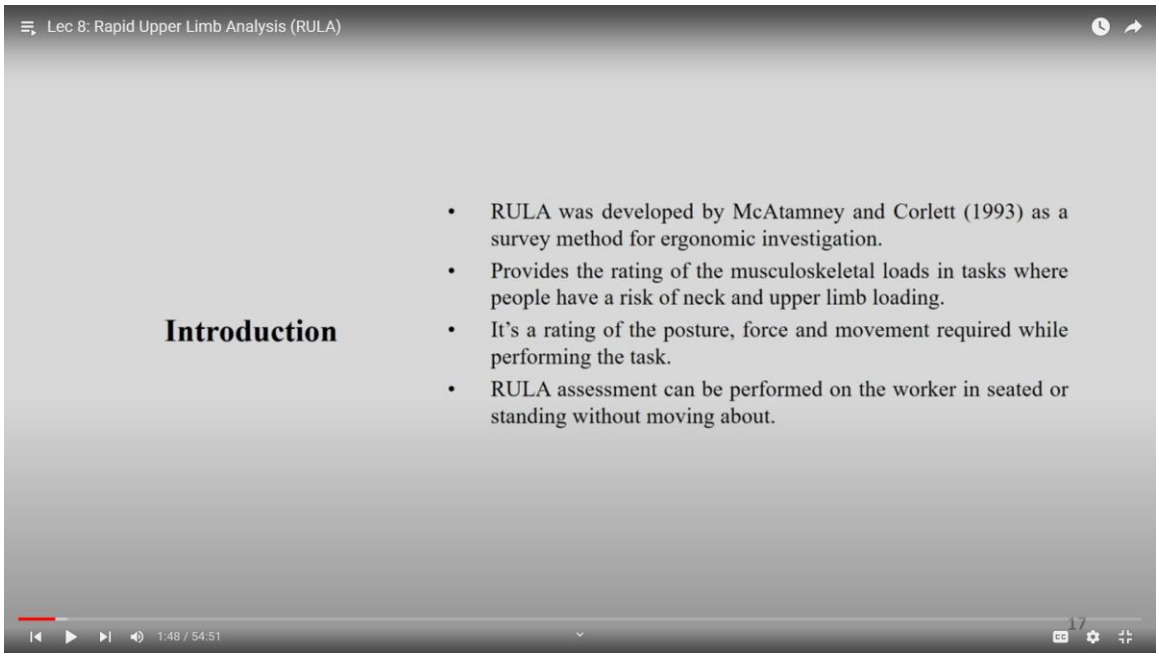
Week – 02

Lecture - 08

Lec 8: Rapid Upper Limb Analysis (RULA)



Welcome back to today's class. Today, we will be talking about one of the very, very popular posture analysis tools or assessment tools, RULA. Whenever we learn about ergonomics, many of us first remember this tool by its name. Its RULA. What is the full form? Full form is rapid upper limb assessment. Although we know this tool very commonly and we keep on using it very frequently in any kind of posture assessment tool, it is very important for us to know the detailed technique and the way we can use this tool. These are the things that need to be known.



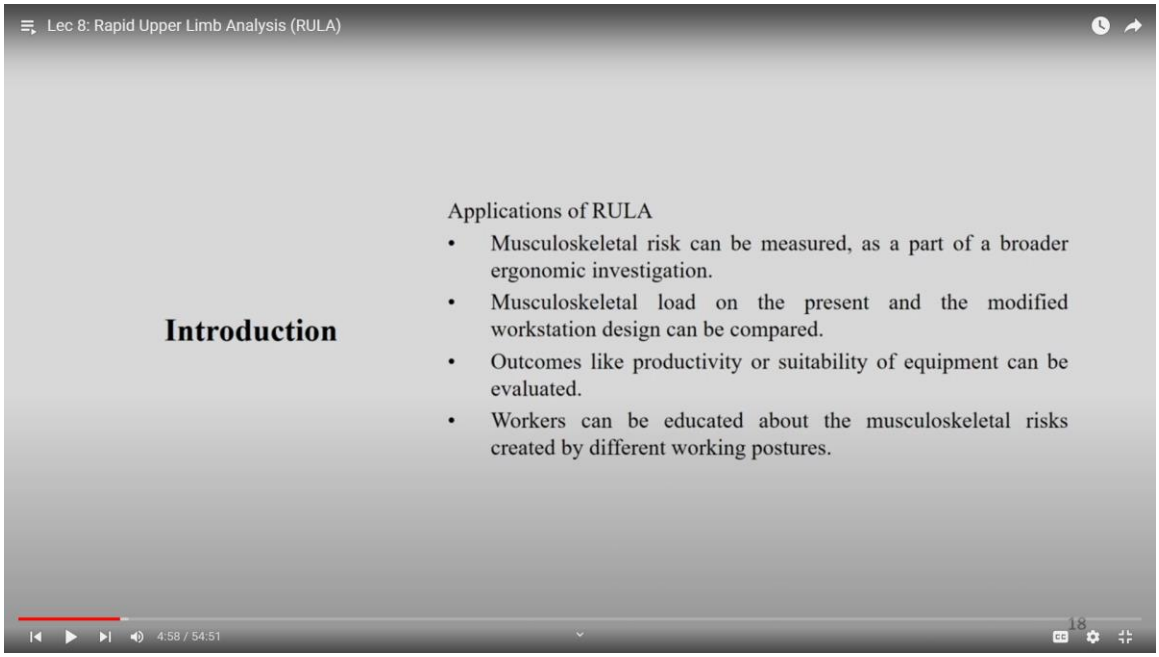
Therefore, we are included in this particular tool in this classroom. So, let us understand the history of it or what kind of background it has. In an earlier class, we learned that OWAS, Ovako working posture analysis, was the first posture assessment technique or posture assessment tool. RULA is kind of its second step.

The next step, not the second step. It is the next step. Right. So, it was developed in 1993. OWAS was developed in 1970, and it was developed in 1993. It was developed by McAtamney and Corlett.

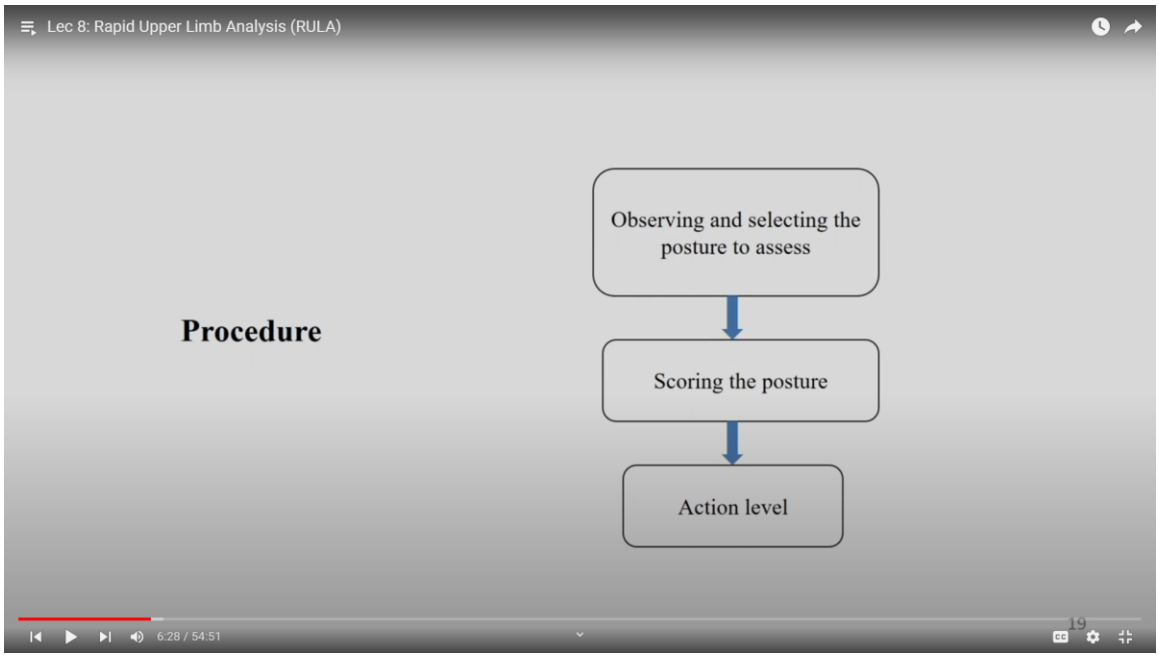
If you go to different search engines, you will come to know that this paper is very easily available, and the full publication is very easily available. It is published in Applied Ergonomics journal. So, this particular method was developed by McAtamney and Corlett and it is a survey method for ergonomics investigation. It has been described as a survey method for ergonomics investigation. It provides the rating of the musculoskeletal loads in the task where people have a risk of neck and upper limb loading.

I mentioned in my previous class that RULA is always applicable when someone is sitting on a particular table chair arrangement and doing some job using mainly the upper limbs. So, this particular tool will help us to understand the musculoskeletal load for a particular task in the case of the neck and upper limbs. Also, it will give us some direction about the trunk. It is a rating of posture, force, and movement required while performing the task. So, in earlier tools, we have seen that posture was more important than the gross posture of the right trunk; like back then, the upper limb, arm, and legs were the gross posture.

Here, we have more details about the upper limb, neck values, trunk values, etc. So, RULA assessment can be performed on the workers seated or standing without moving about. Now, here concern is if somebody is evenly seated or a person is standing, only the upper limb is associated with some kind of activity, then we can use it. However, it is always suggested that if someone is sitting and doing a particular job, then only RULA is more applicable. So, where are the applications of RULA? Musculoskeletal risk can be measured in terms of posture as part of a broader ergonomics investigation.

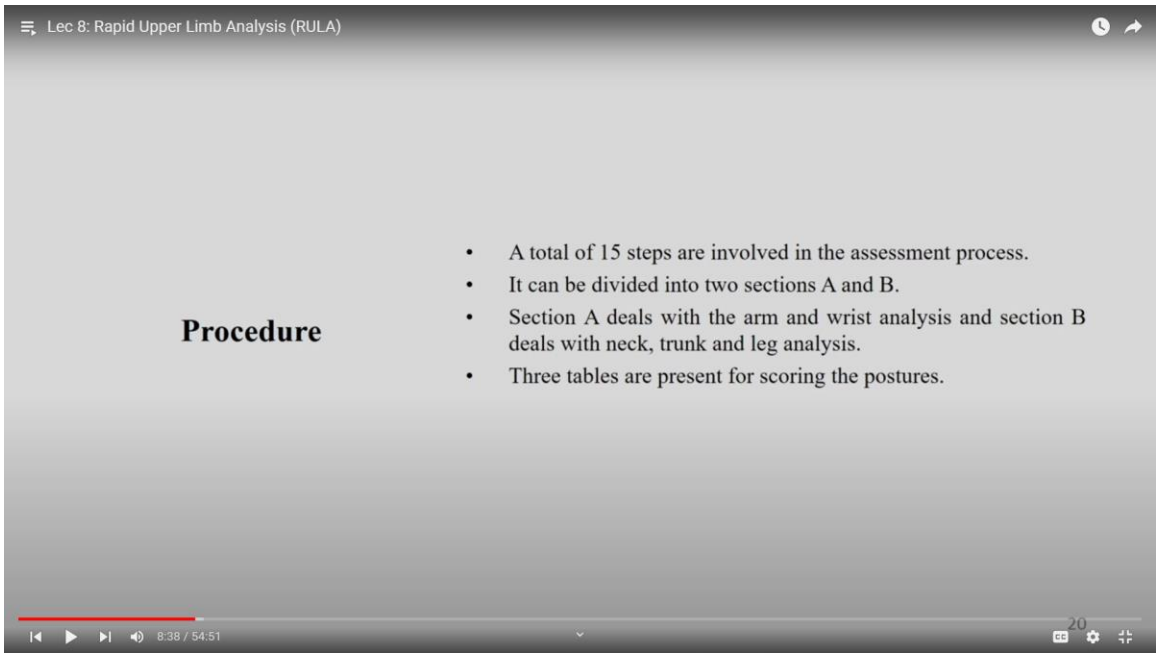


The musculoskeletal load at present and the modified workstation design can be compared. So, if you have some target for doing some kind of workstation modification that is going to impact the whole body posture, in that case, you can make a comparison using RULA before and after. Outcomes like productivity or suitability of equipment can also be evaluated, and workers can be educated about the musculoskeletal risk created by different working postures. So, you can easily educate them by showing some kind of awkward posture and their rating and a good posture with their rating, and you can explain how the awkward posture is going to create a musculoskeletal load on the body. So, this way, you can use RULA, and you can have research studies using RULA.

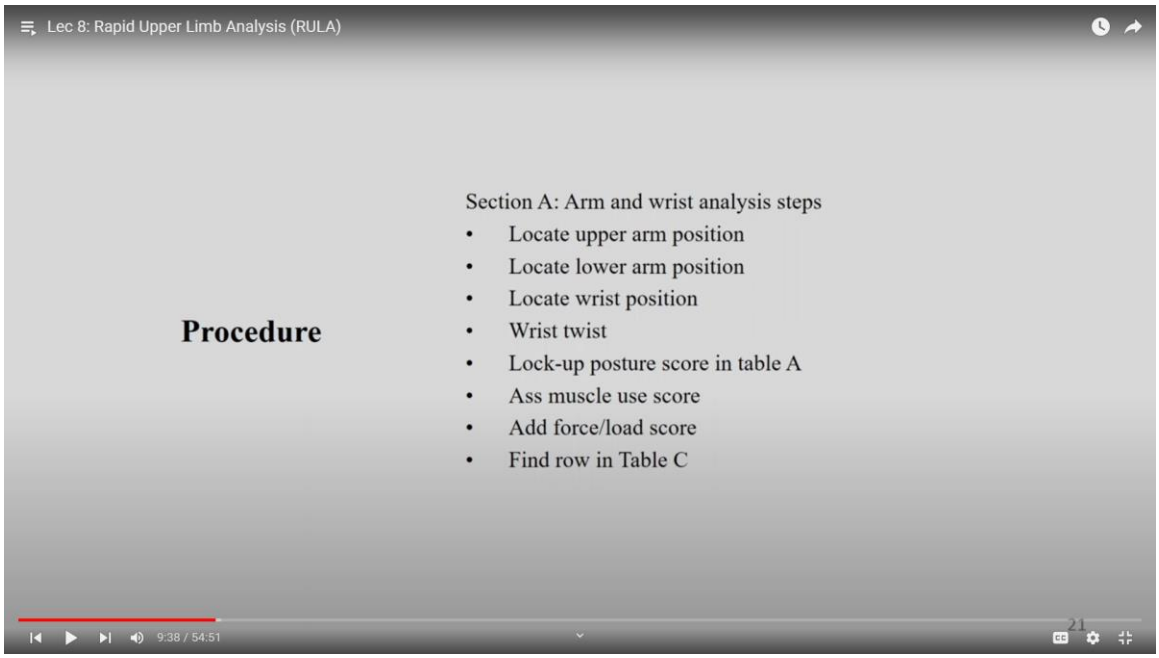


Now, what is the procedure? The procedure is very, very similar to what we did in OWAS. First, what do you have to do? You have to observe the whole activities, the set of activities, which activities, and which task you are going to select based on two major decisions that are the frequently occupied posture and the posture which the worker is holding for longer hours in the whole shift. So, first is your observation, and then select the posture that you are going to assess. So, selecting the posture and the associated task. Then, using that particular photograph or using that particular figure, what do you have to do? You have to score that posture.

Once you do the scoring system, we are going to learn in detail what you will do. We will see the action level, and based on the action level, we are going to take measures. So, we are going to make the decision about where we should start our intervention program. So, mostly, it happens that whenever we look at the higher grant score, we call the grant score the ultimate value of the RULA, we call it as grant score. Once we receive that grant score, what will we do? We will compare it with the action level chart, and if we see it is very high and it suggests that you need some kind of changes, then what will happen? We will go for the intervention and that intervention initiation point. also, we can look back at the individual posture score, and from there, we can get some direction on where the intervention can be possible. Now, let us understand in detail.

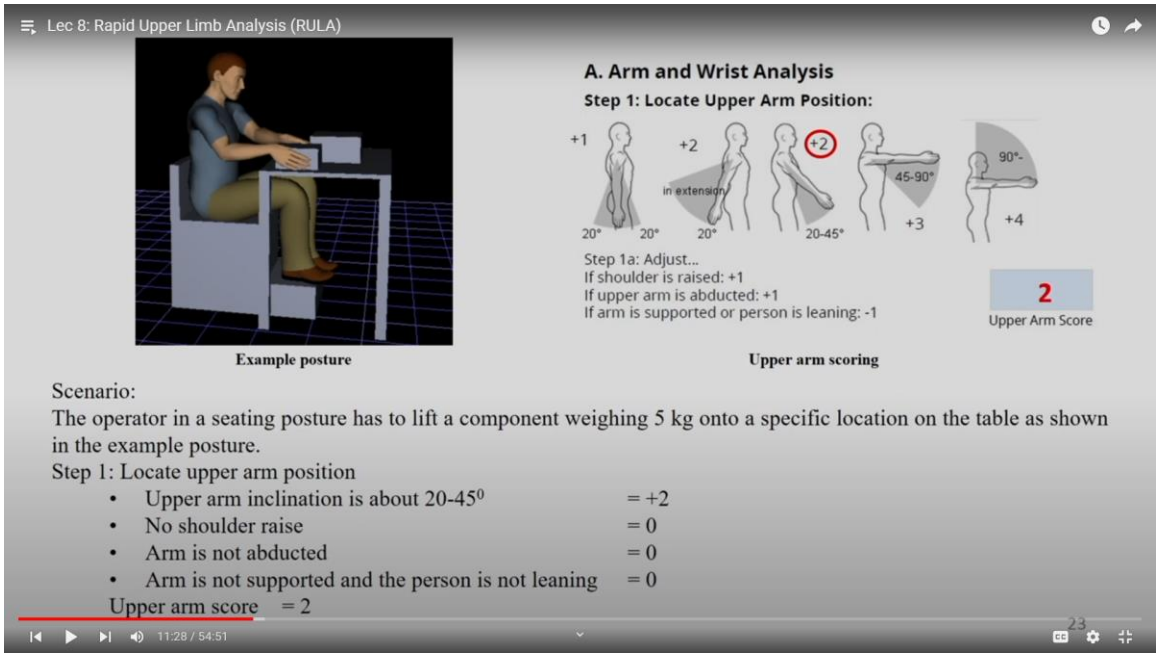


A total of 15 steps are involved in the assessment process, which can be divided into two major sections that are section A and Section B. Section A deals with the arm and wrist analysis, and Section B deals with the neck, trunk, and leg analysis. As I mentioned, this RULA is mostly for upper limb assessment or analysis. That is why the wrist and arm in this analysis are very important, and they are taken care of in section A, while the neck, trunk, back, and legs are taken care of in the next part. We have three pre-computed tables in this particular tool, and we are going to understand what these tables are and how we use these tables.



So, in section A, where we are going to analyze the arm and wrist, what we have to understand is that we have to locate the upper arm position, we have to locate the lower arm position, the wrist position, we have to understand what is the wrist twist. Once these three portions are, you know, being observed and marked as what we have to do, we have to put it in Table A. Once we get some score in Table A, we have to understand the muscle use score, and this is not as it is added. This is add ok and force load score, and from there, you have to go to table C. For the next part, which is section B, trunk, neck, and leg, first, you have to locate the neck posture, trunk posture, and leg posture.

Once we have these three components, you have to find the posture score from Table B. Again, as similar to the previous table, you have to add the muscle use score and force load score, and from there, you have to get the value in table C fine. So, let us go for each table and each body part separately. First, we are talking about this as just an example. You can have your own posture, or you can take your own example for more understanding. Now, this is for your upper arm.



What does this upper arm position say? What is the definition of your upper arm? From shoulder till your elbow, ok. So, from the shoulder to your elbow, this portion is okay. So, if the upper arm is moving forward 20 degrees and moving backward 20 degrees, then the score value is plus 1. If the upper arm is moving forward from 20 degrees to 45 degrees, then plus 2. Anything beyond 20 degrees, is plus 2. Now you have to understand similarly, as I discussed in OWAS, few postures hypothetically are possible to hold, but in industry, such working posture is not possible.

So, in the case of that second option, which is an extension of more than 20 degrees, it is

really difficult for someone to work in that particular situation or particular posture. Hypothetically, only we can adopt such a posture. So, beyond 20 degrees, we cannot have any kind of upper arm posture in working posture or working conditions. So, we are not going to consider the extension portion further. We are going to only go for flexion in the forward direction.

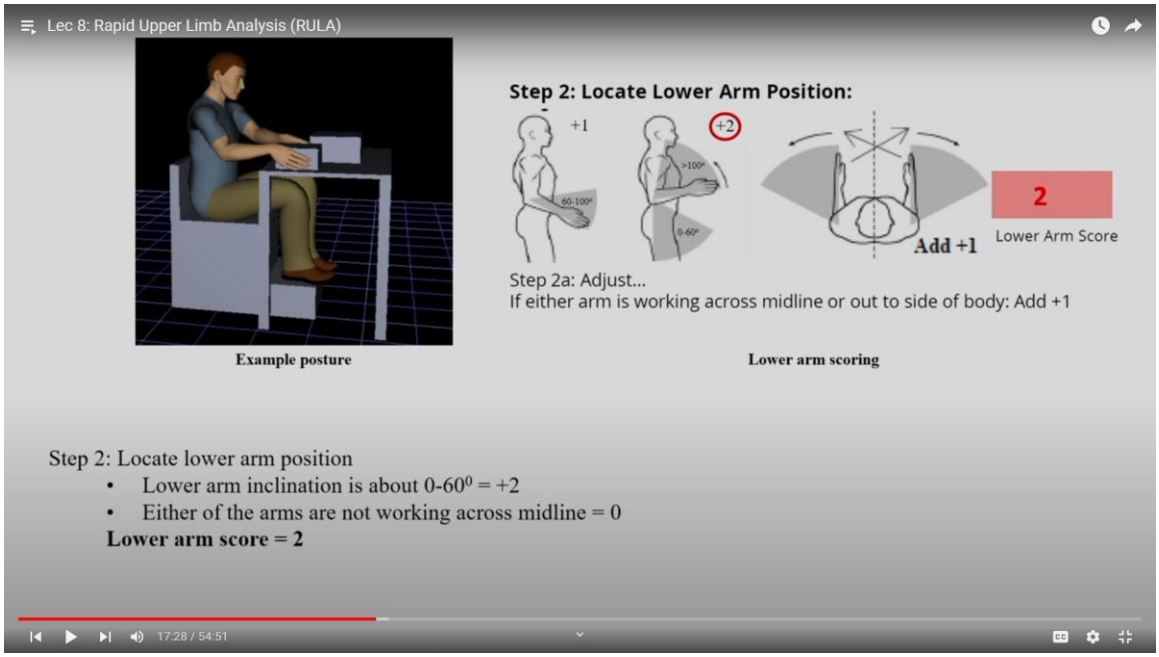
So, 20 to 45 degrees is plus 2, 45 to 90 degrees is plus 3, and if it is beyond shoulder level, then it is plus 4. So, we have four ratings; one is 0 to 20 degrees forward or backward direction that is plus 1, 20 to 45 degrees forward plus 2, anything beyond 20 degrees in the backward direction plus 2, 45 to 90 degrees plus 3, and beyond 90 degree that is the above shoulder level that is plus 4. Now, this is only the initial numbering and initial scoring. Apart from that, we also have something more to add. Once this primary posture is scored, we will have to look for some kind of adjustment.

What is it? If your shoulder is raised, the shoulder is in a relaxed condition; if it is raised on any side, whatever side you are actually analyzing, you have to add 1 ok. So, if you are raising your shoulder, that means you are putting an extra load on your musculoskeletal system. So, if you are raising your shoulder, then in that particular posture, you add 1. Suppose your original score is two. Then, if you look after the adjustment of your shoulder point, it becomes 2 plus 1 3. Also, you have to understand if the upper arm is abducted; abducted means away from your body.

So, if you are working in some condition where your upper arm is going away from your body then you have to also again add one more value. So, you look for whether your shoulder is raised or not, and you look for whether your upper arm is abducted or not, which is plus 1 in both cases. Whereas, if you look at the posture and find that your upper arm is supported with some kind of hand rest, then, of course, you are giving some relaxation; you are helping the person to hold that particular posture in a more comfortable way. So, you have to subtract one. So, here you have to be very, very careful if your hand is hanging and you are doing the job without an armrest, then no change.

If you have some handrest or armrest, then you have to subtract one from the main value. For example, suppose you have an original score plus 2, and you have some shoulder-raised posture. So, 2 plus 1 3, the posture is also abducted, and then there is one more addition, 3 plus 1 4. Also, you see that there is some resting for your arm; there is some rest, then subtract 1.

So, 4 minus 1 3 ok. Therefore, the final score was 3. So this way, we calculate the upper arm score correctly. So,depending on the position of your upper arm, you calculate the upper arm score in the beginning, and then you adjust the adjustment to whether the shoulder is raised or not, whether the upper arm is abducted or not, and whether there is any support for your arm or not. Now, let us go for the next part of its assessment, which is the lower arm. So, you have to locate the lower arm and give the scoring.

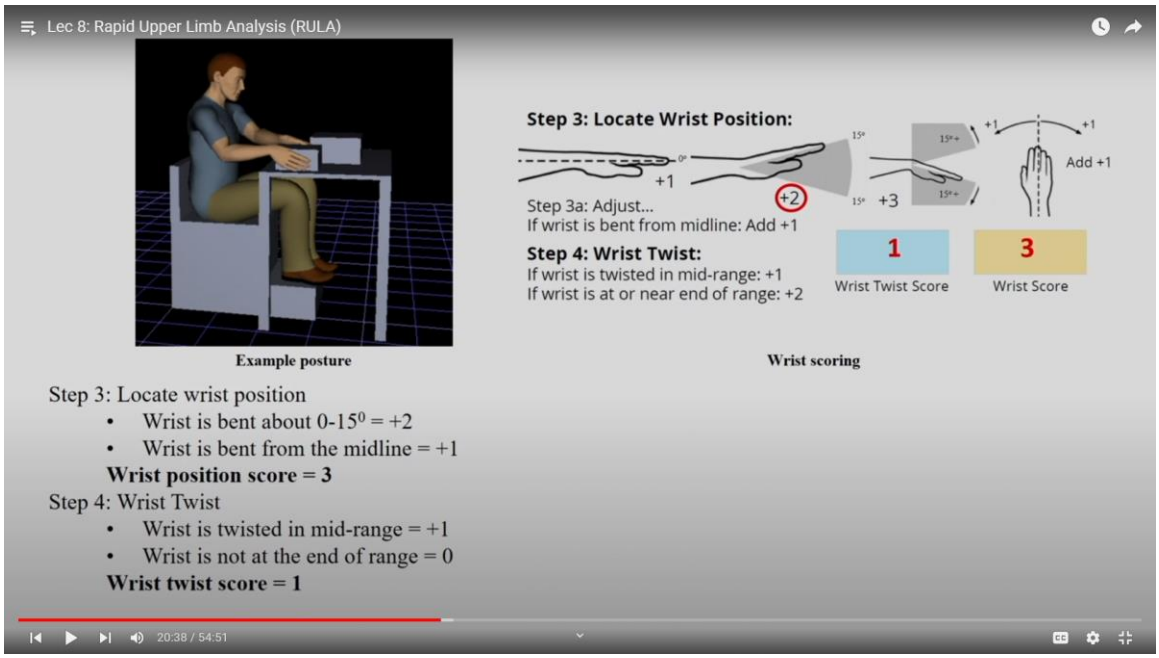


Now, here, the lower arm position is associated with your upper arm. So, the kind of reference point that we will be taking for the lower arm will be the position of your upper arm. In this figure, you can see if this particular figure it says if your lower arm position is moving 60 degrees to 90 degrees, then it is plus 1 because if you look if you adopt this particular posture, you will find this is the most comfortable posture for your lower arm. So, this is 1. If it is beyond 100 degrees, then it is 2 or lower than from 60 degrees to 0 degrees, then it is 2 any one of the.

So, if you are hanging your hand for a longer period, then it is really tough, right, because all the shoulder load will come on this particular portion. So, that is 2, and once you have 1 or 2, then comes the adjustment. What adjustment? Adjustment is if you are working on the body midline like your job is just in front of your body. So, what will happen? For both arms, you do not need to stress any parts extra. If you are working on the body midline, then there is no problem. But if any one of the hands is crossing the body midline like this is your body midline, if you are working not at this particular point, you are working here or working here for that particular arm or for that particular lower arm, what you have to do you have to give us an additional score that is the plus 1.

For this particular example, what is happening is that the person is working in a more than 100-degree position. That is why the initial score is plus 2. However, he is working on, you know, just in front of his body like he is working on the midline. He is not crossing anybody midline. So, there is no adjustment. If the person is doing something on the left side or right side, anything in any degree So, there is no difference between the 10-degree deviation and the 20-degree deviation.

In all the cases, if there is a deviation, it will add 1. So that way, we calculate the lower arm score. Now, this is done for the lower arm. The next comes to the wrist position. What is your wrist? Here, only two options and three options are there.



What does it say? If it is just like this. So, if there is no deviation, no deflection, not deflection, no extension, nothing, then it is 1. So, 0 degrees at the 0 degrees if your wrist is positioned, then it is plus 1. Suppose it is moving in both directions, extension or flexion at 15 degrees upward and 15 degrees downward. If that is available, then it is plus 2. If it is anything beyond 15 degrees, either direction forward, upward direction, or downward direction, then it is 3.

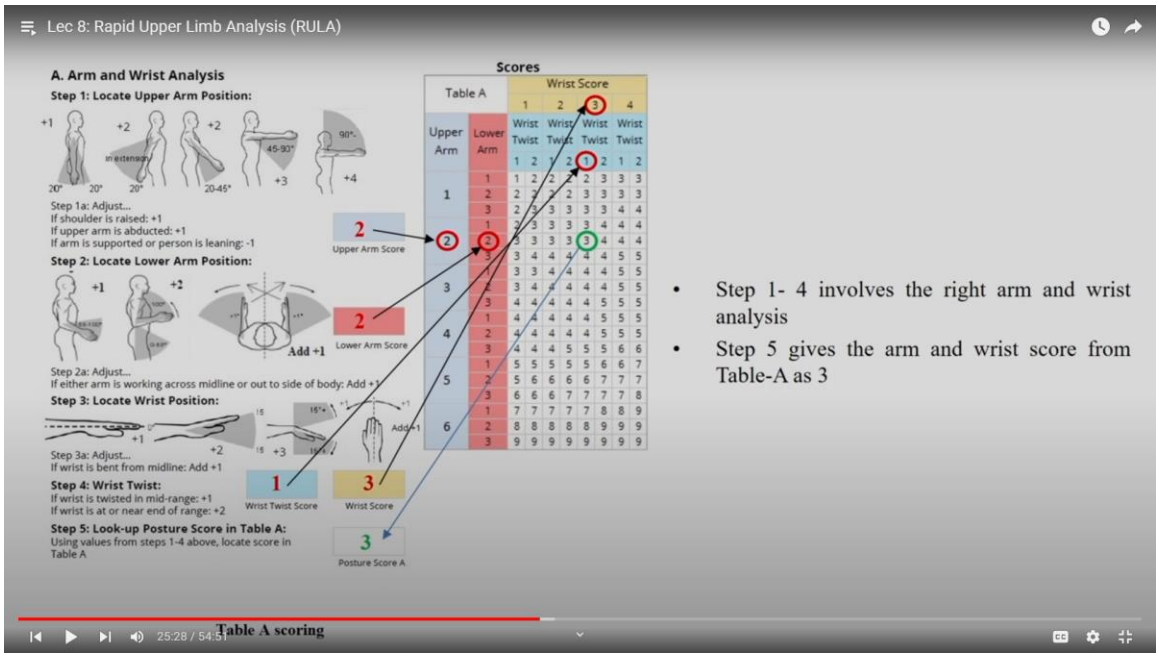
So, you can understand this value. Now, for this particular position, you can see that the wrist score may be 3. The next part of the wrist is whether the wrist is twisted or not. So, the wrist is twisted or not this way it is twisted or not. So, if the wrist is twisted in the mid-range, then it is plus 1. If it is, no wrist is twisted at or near the end range a little bit or more than that.

So, in this case, it is not a measurement to any degree. So, it is based on the range of motion understanding of the observer, and you have to decide. So, it comes with some kind of experience, expertise, opinion, and also so on. Now, here I would like to mention a very important point. This RULA that rapid upper limb assessment is okay just gives an understanding of whether there is any musculoskeletal load there or not.

If it is there, what level is it at? Now, my concern is if I find while doing the experiment and my data collection that I have some confusion about what exactly this degree is. Is it 15 degrees or 16 degrees? Suppose I am talking about this particular position is it 15 degrees or 16 degrees because it is based on your photography, there can be some errors in the photography, and if you look at the kind of data collection we have to do with the human and at the working condition, it becomes tough to get very accurate photograph right. We always try to do it. As a researcher, I aim to collect my data very correctly. However, there is always a chance for such cases that we have some confusion between that is this 10 degrees or it is 15 degrees, or it is 15 degrees or 16 degrees sometimes it comes. Now, the concern is if you have any such situation, of course, you can take 2-3 opinions.

So, from experts from your peers, you can take opinions to avoid because it is a risk assessment. So, to assess the risk, you should go for the higher level of risk so that you are not neglecting any kind of risk. So, if you are confused about this particular position, suppose it is 14 degrees or 16 degrees; then the suggestion is you consider 16 degrees, not 14 degrees, because if you consider 14 degrees, then it is 16, then you are actually neglecting the risk. But if you are considered at 16, then maybe the result is a little exaggerated, but you are not neglecting any kind of risk, ok?

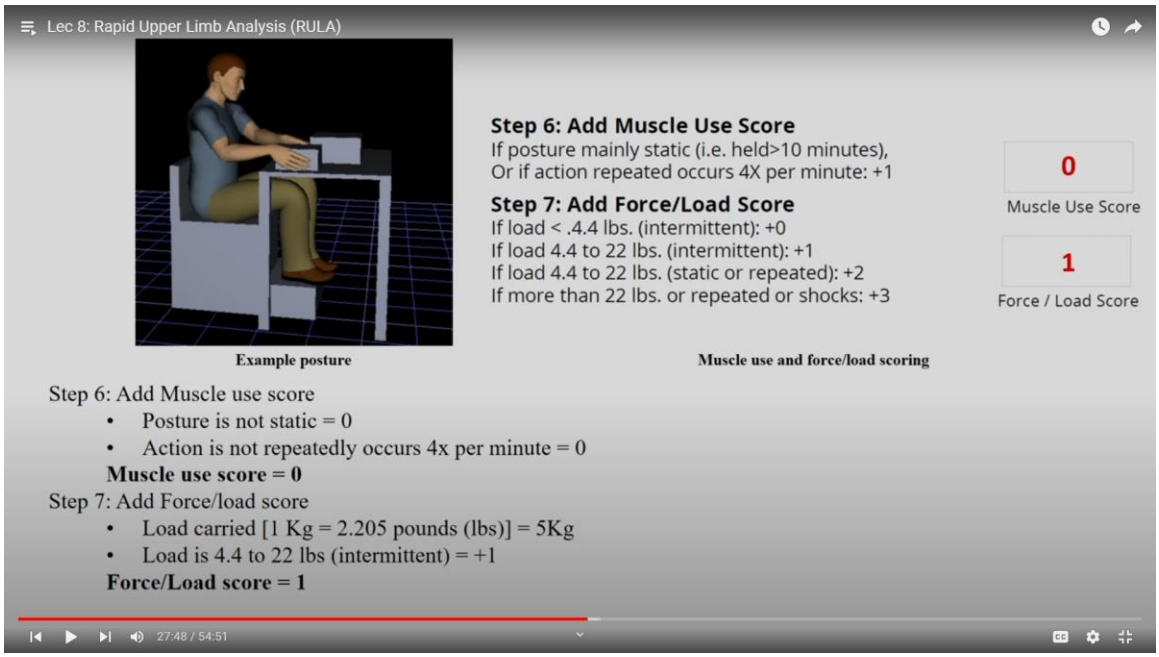
So, that way, for RULA, REBA, or all these types of assessments, you should always, whenever you are assessing the risk, go for the higher value of the fine. So, you understand how we collect the wrist position and wrist-to-wrist position. So, for this particular figure, this is the kind of position we are we have calculated, and this is just for our example. Now, let us understand if we have these numbers. How do we read this particular table? This particular table will help us get the first score from section A, okay? So, in this particular example, our upper arm score was first 2.



So, you are actually located in this particular block. You need not see this portion, this portion, this nothing. So, you have your vision will be here only ok because your upper arm score is 2. Now, once you have the upper arm score, then, you go for the lower arm. What was our lower arm score? It was 2.

Now, again, from this 1, 2, 3, our lower arm score was 2. So, again, I checked, and this is the area where I should look. After the lower arm, I should check the risk score. Our risk score was 2 plus 1, which was 3. Now, if it is 3, then this is the only region where I should check, right? Now, once we know the wrist score, we have only 2 values from the risk to wrist score. We confirm that my score is 3.

So, for this particular example, we have the score value from section A, which is 3 for this example. Now, using this, this is a standard table. It is available from the original publication as well as from this. also, you can copy this from this as a pre-computed table, right? So, from this table, you can get your A score. Now, this is what will happen Give the upper arm and risk score from the table A as we got 3. Now, what will we do with this score 3? Now, we have to make some kind of adjustment when we are talking about muscle use because the upper arm is the lower arm. These parts are working.



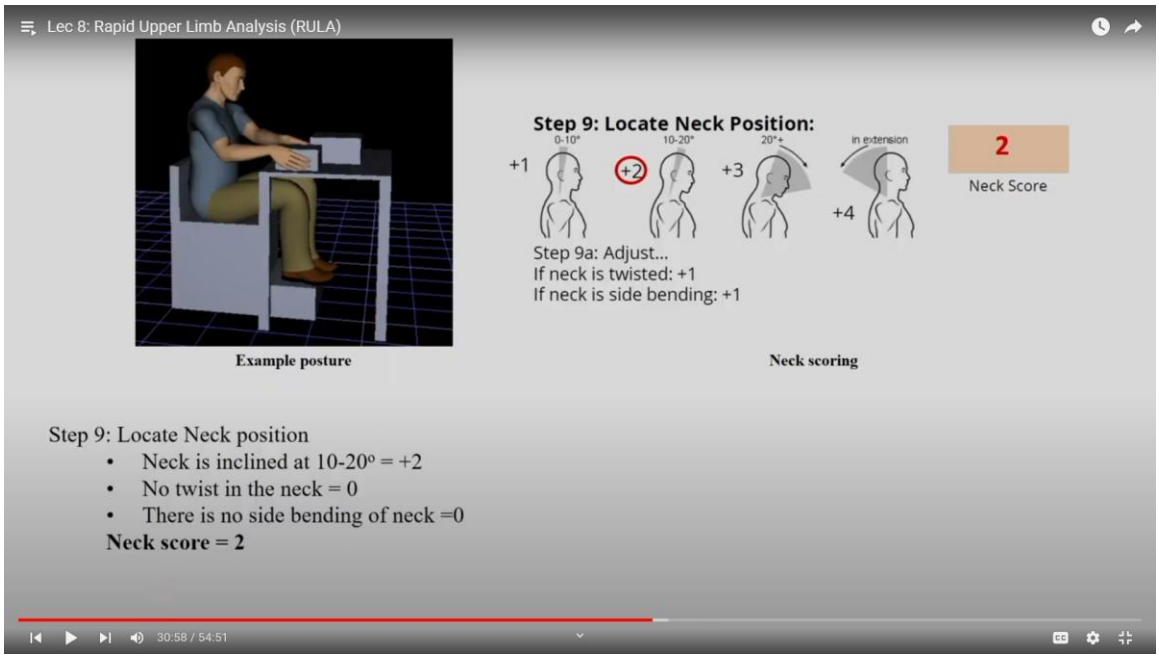
So, you have to add the muscle use score and load or forescore. So, what will happen for this particular example? So, here is the explanation of muscle use score: if the posture is mainly static or if any of the actions repeated occur 4 times per minute, then it is plus 1. For force and load score, the load is, you know, 4.4 pounds less than that, then it is plus 1. You can convert it into kg.

If the load is 4.42 to 22 pounds plus 1, 4 points if it is intermittent same load if it is intermittent, then it is plus 1, but if it is static or repeated, then plus 2, and if anything more than 22 pounds and repeated or sudden jerk sudden shock then it is like in case of some kind of vibrating instrument drilling machines and for those cases ok. So, it is plus 3. So, once you have your score A, that is from section A, you get a score, and then you add muscle use score and load or forescore. So, for this particular example, our muscle use score was 0 because there was nothing. So, posture was not stat is not static. They were doing a lot of movement.

So, it is not static, and the action is not repeated repeatedly occurs 4 times per minute. So, that was also not there, which is why it was 0. So, it is 0. Force use was a very easy job. So, less than I know this, 4.4 to 22 pounds, and it was intermittent because you can see this is a box, right? They are taking it, putting it aside, maybe taking it packing it, putting it aside.

So, it was not that heavy job. That is why it was only 1. So, our earlier score was 3; we added 0 for muscle use, and we added 1 for force and load, and then the final score

became 4. This is for your limb upper limb. So, with the upper arm, lower arm, wrist, and wrist twists, we got a final score of 4. Now, let us go for the next body part, which is your neck, trunk, and leg.



Now, let us go for this particular portion, which is the neck location. How do you do that neck? So, when you are sitting in a particular position, you are looking in the forward direction. Only movement in the forward direction is okay, that is, to 0 to 10 degrees. If it is 0 to 10 degrees, then it is plus 1; 10 to 20 degrees in the forward direction, it is plus 2; more than 20 degrees in a forward direction that is in the flexion position, then plus 3, and here it is very important any activity in extension mode ok. Any activity in the extension mode for your neck is plus 4 because this is a very dangerous working posture. You can do it for your exercises or many other small laser activities or something, but you cannot hold this particular posture in an extended neck extension posture. In an industrial situation, you cannot do any kind of activity right.

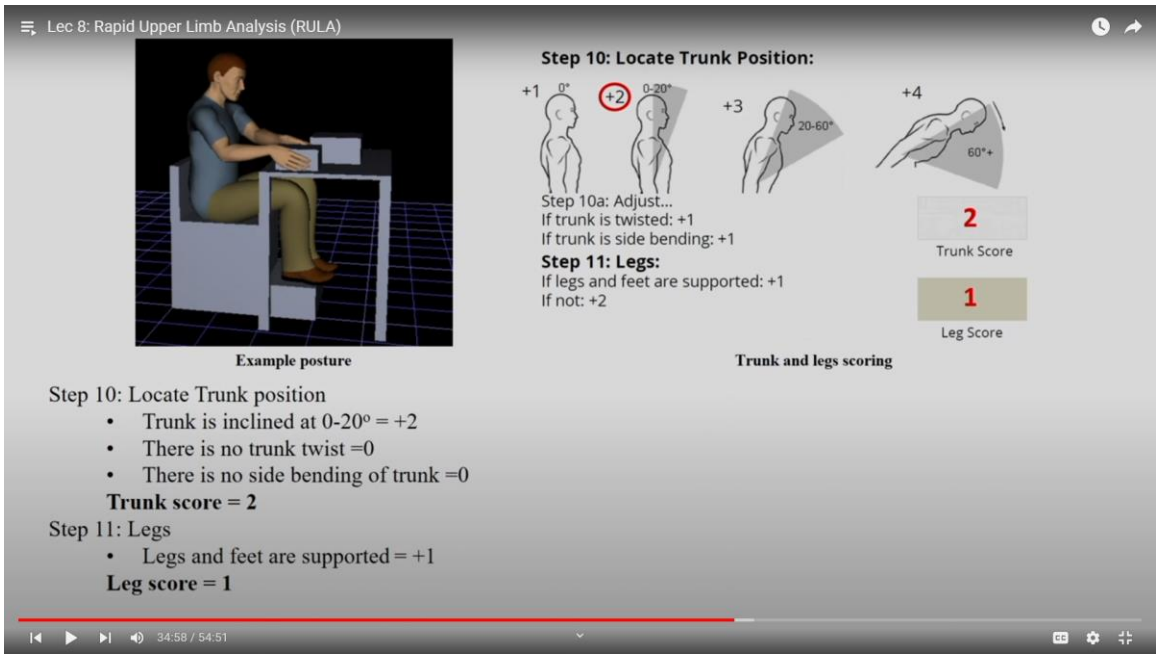
So, if that is available, that means that posture is extremely bad. That is why it is plus 4. So, any posture in the extension position of your neck is plus 4. So, it is in getting the highest value. Similarly, what we did for your upper arm and lower arm was some kind of extra adjustment with the basic scoring for the neck. We also have some kind of extra adjustment. What is it? If the neck is twisted, we will say this position this movement.

Anything this movement, if it is there, suppose your neck is bent towards, you know, 0 to 10 degrees, and you are working in this position. So, then it is forward that is plus 1 and twisted either on the left side or right side, then it is one more plus. Along with that,

you need to see this is twisting, this is twisting, the next portion is bending, this is side bending, ok. So, if any side bending is there, then it is plus 1.

So, if any one of the conditions exists, then it is plus 1. For this particular example, the neck score is 2; the basic score is 2. You can see you can measure it. You know, 10, and from this, you can measure it to be around 10 to 20 degrees. So, that is why it is 2. However, he is working just in front of his body midline.

So, the neck is neither twisted nor bent. So, there is no more addition, though, and that is why the score remains 2. If something is there, whenever you are working away from your body, only this twisting and bending portion will come into the picture if you are away from your midline body. Now, let us go for the trunk. It is very similar; if you are straight, you are working, and there is no forward movement or backward movement, then it is plus 1.



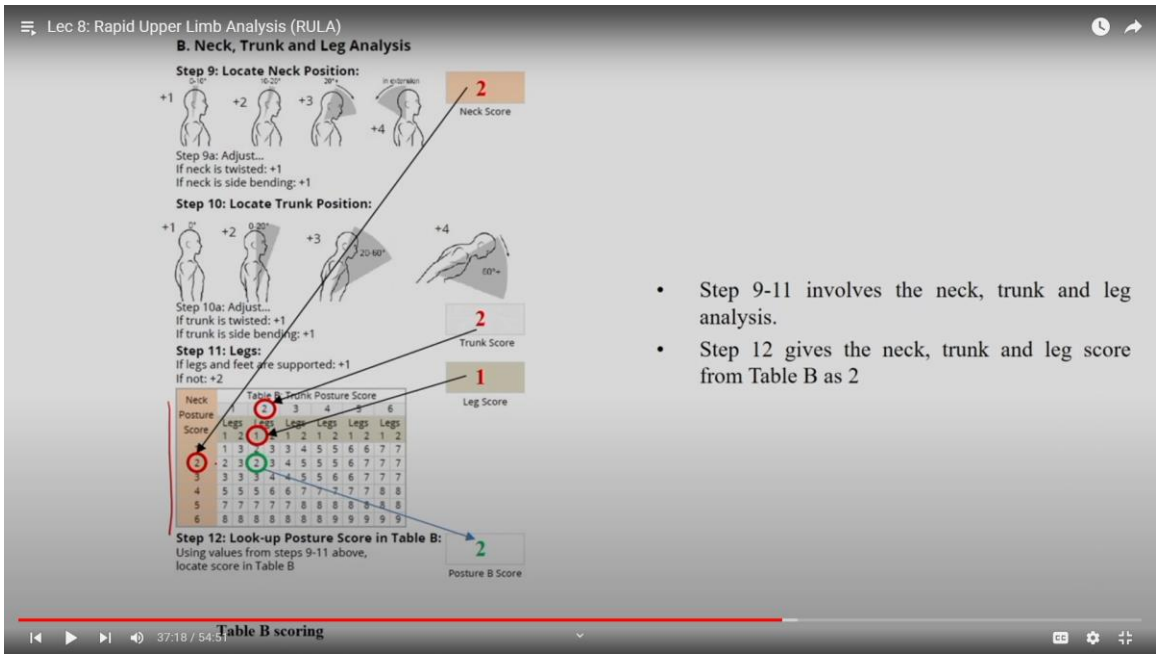
If 0 to 20 degrees of forward movement, then it is plus 2. If it is 20 to 60 degrees, then plus 3, and if it is more than 60 degrees, so you are actually bending a lot from your lower back. So, then it is plus 4. However, there is no posture that is available in industrial conditions or working conditions, which is in trunk extension. So, there is no such scoring available. So, we should also give a similar kind of adjustment that is the trunk is twisted, which means you are moving towards this direction then plus 1.

If it is bending in this direction, then it is plus 2, one more, plus one. Ok, that is the kind of adjustment you have to do. So, for this particular example, we found that the trunk is,

you know, bent toward a forward direction, very light bending, but not straight towards the desk where there is bending. So, 0 within 0 to 20 degrees, is why plus 2, and as I mentioned earlier, this particular person is working just in front of his body. So, there is no crossing of your body midline.

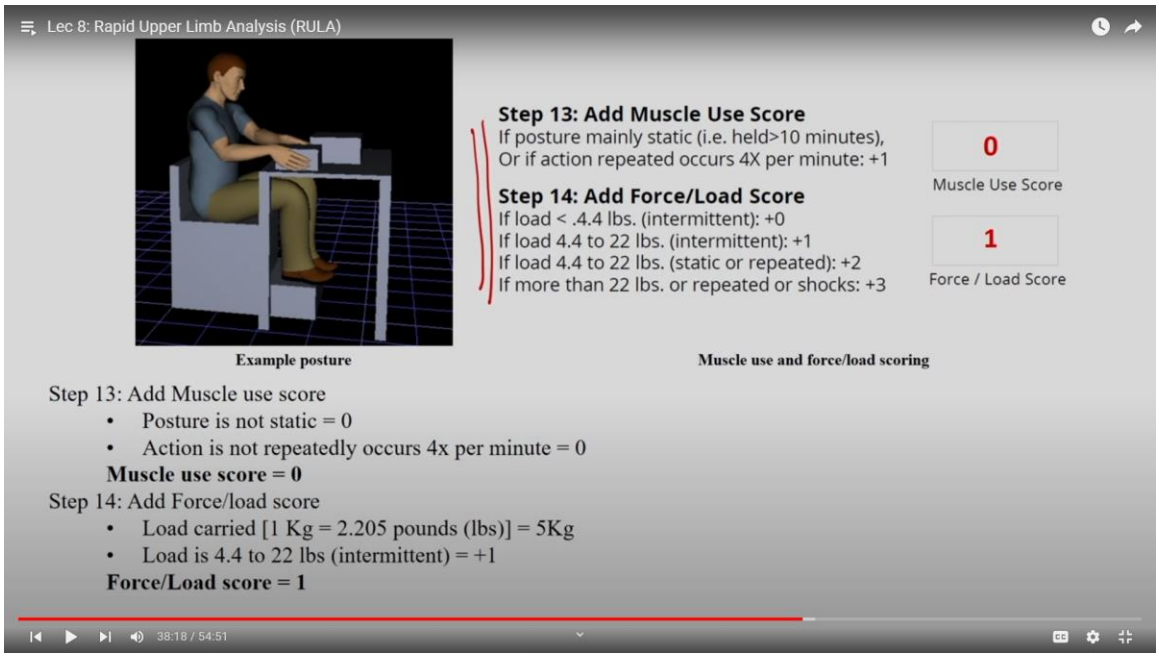
So, no adjustment for this and this. So, no value. So, 0 0 ok. So, the trunk score remains 2. Now, coming to the leg here, it is not in detail, only if you need to see if the legs or feet are supported or not. If supported, then only plus 1; if not supported, then plus 2. So, there is no more detailing.

For legs, you have to only see if it is supported, then it is comfortable. So, it is plus 1; if not supported, then plus 2. So, that is all for the scoring of your neck trunk and leg. Now, let us see how we read the next table.

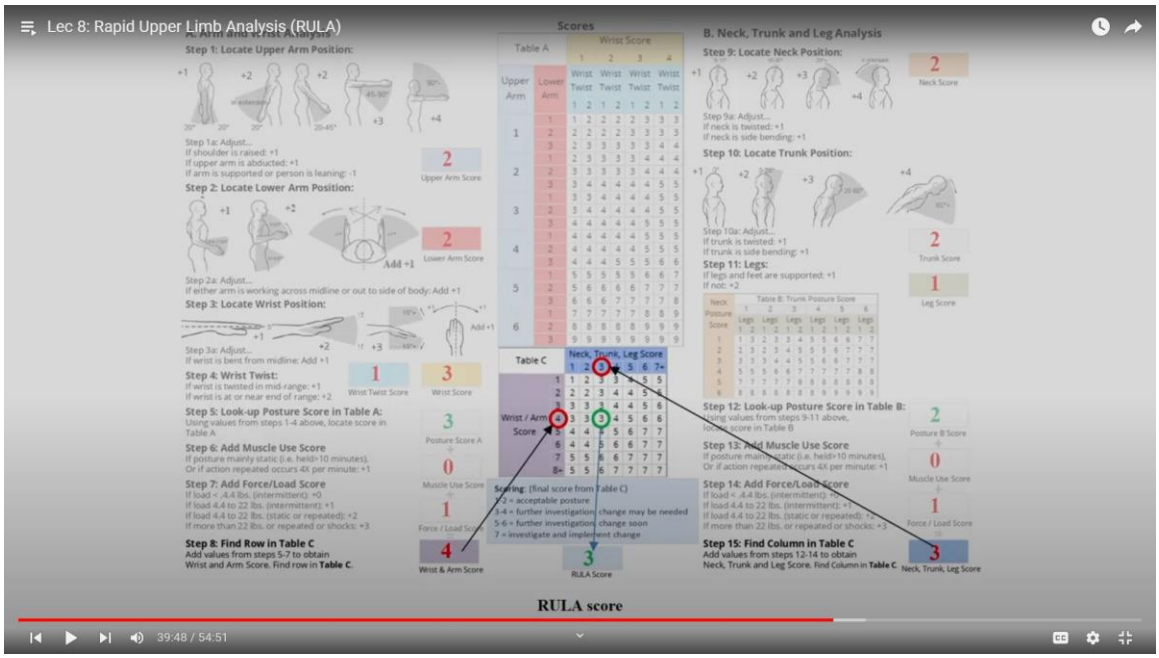


It is very similar to what we did for the upper arm. So, here it was, your neck posture. It was 2. So, you have a kind of system where you are here, and this particular zone is fixed for you. Now, after your neck, you have a trunk. So, in the trunk, you have 1, 2, 3, 4, 5, 6, some this type of, you know, scoring system.

So, in that, your score was 2. So, again, you are in this particular zone 2 and 3. Now, you have a leg score of 1. So, your final score became 2. Similarly, what we did for these from section A for section B also required some kind of adjustment, that is, the muscle you scored.



Similar definition. So, it would be best if you did not relearn it; it is similar. So, for this particular example, we see the muscle you scored is actually 0 for this particular example, and for the load on 4 scores, it comes to around 1. So, our score was 2. So, 2 plus 0 plus 1 becomes 3.



So, earlier from this, we have 4, and now we have 3. So, these are the 2 scores we got. Now, we will derive the grand score. How do we derive a grand score? So, this is this particular table is called table C, and so, from this, we have 4, and then we have 3. So, we have to go go. So, this is the location, and then this is the location.

So, we have 3; we have 3 right. So, we got the final value as 3. Now, let us see what the action level is and what these 3 mean because ultimately, once we get the grand score, we have to tell what this grand score means. Now, there are some action levels. This is the portion where you can interpret your final score, and this is the whole worksheet. This helps you in data collection. In this example, I compiled everything in one sheet, and from here, you can do your data collection.

Now, as our RULA score, or we can say the grand score is 3, then we have to see what it is like. So, 1 to 2, it says acceptable posture. So, if your posture and your RULA grand score are within 1 to 2, so either 1 or 2, then you say that yes, this particular working posture is acceptable. You can work with this particular posture at least for the whole work shift.

The next range is 3 to 4. What does it say? Yes, it is kind of like no concerns are there. You need to investigate, but it is not that urgent. Yes, there are some possibilities that if you continue working, you may get in trouble. However, it is not that bad, ok?

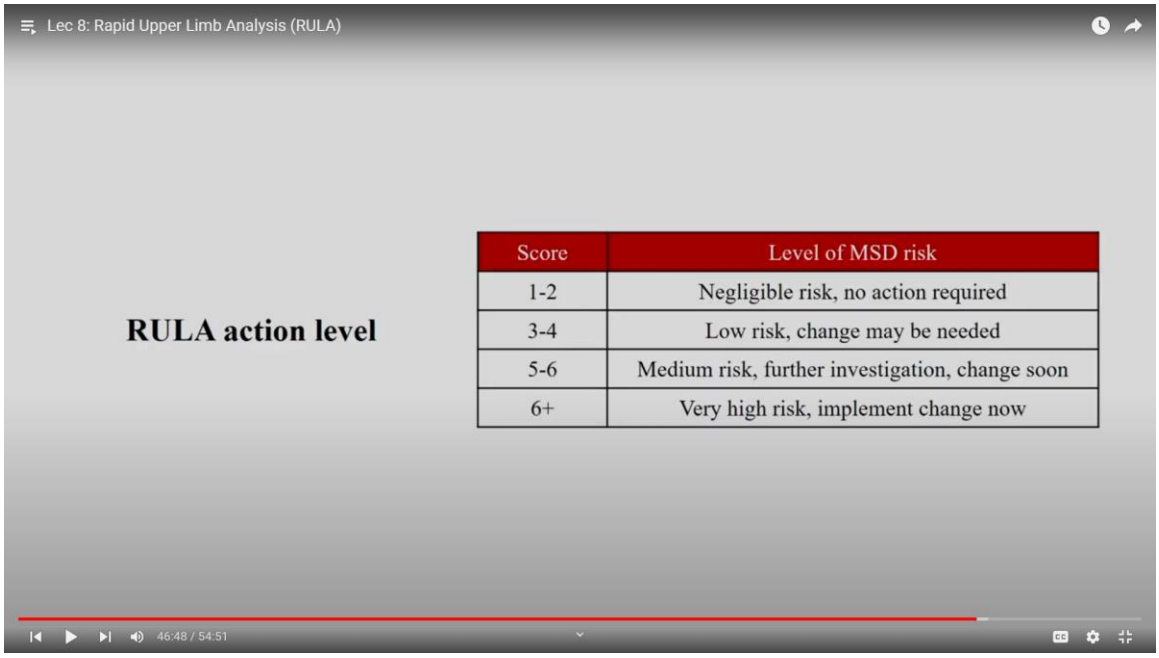
So, the language is being further investigated, and changes may be needed. Now, the next step is 5 to 6. Here, you can see the next step is 5 to 6. Further investigation and changes are required soon, and if it is more than that, it is 7 and more than 7, then investigate and implement the changes immediately because if you do not take immediate action, you will have some kind of bigger trouble. That is why this is dangerous or quite risky. Now that we have the value, we understand how the RULA score can be interpreted. Now, let us go into more detail about once we interpret the grand score, how do we start our intervention? We have to make a decision right that I need to make changes.

I realized, being a researcher, being the observer of this particular work posture, that yes, this particular posture is not good, is awkward, and the risk level for musculoskeletal disorder from the posture point of view is risky fine. Now, I need to start my intervention; I need to see how I change it, how I take it to the lower level and lower level of risk, and how I start. What we need to do is relook at the individual scoring. Okay, how do I do that? We have individual scoring for the upper arm, lower arm, wrist, neck, and trunk, we have all these individual scoring; we need to see which body part or which scoring these final values has gone on the upper side, has gone in the extreme side, or on the higher value. If we understand that, then we need to check in the workstation or workplace what the components are and what the workstation elements or design elements available are that are causing to hold that particular posture of that particular

body part. Okay, it is not that everything is responsible; maybe some components are responsible, so we need to identify that.

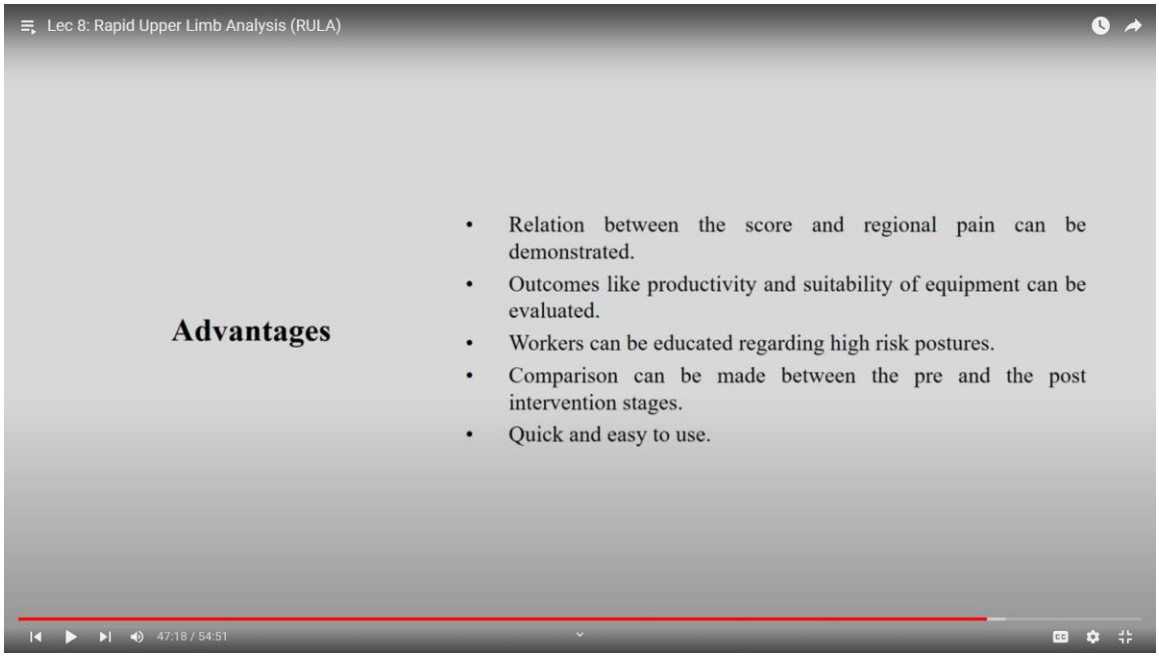
If we can identify that, then there is a very direct, you know, initiation point, like you have a very specific point where you can start your intervention. So, RULA's score not only gives you an understanding of the level of risk, but it also helps you to start or to get the direction from where you start your design changes or design modification. Okay, modification in the product level, maybe positioning, maybe the orientation, many other aspects, so it is absolutely based on your case-to-case, okay. So, it keeps on changing; the decisions will keep on changing. It may happen that the lower arm is the only body part or only component that is causing the higher value of this RULA score.

However, once you look at the workstation, you realize that there is very little chance to change it due to work demand. Now, being an ergonomist, you cannot force the management or the whole system that you need to change; it is not possible. If only possible, because without compromising productivity, if it is possible, then you make the changes. But if, in any case, there is a possibility it is not possible to change that particular portion, then you have to re-look into the other body parts, so how can we rework and take that final grant score on the towards lower risk region? So, it is not always whichever is having more impact; we will start with that maybe in the working conditions, maybe the work demand is such that we have less freedom to work.



So, that is where we have the challenges, and designers always take up those challenges and do a lot of design modification, and they come up with changes in the whole workstation or changes in the position, layout orientation, and everything. So, that is how

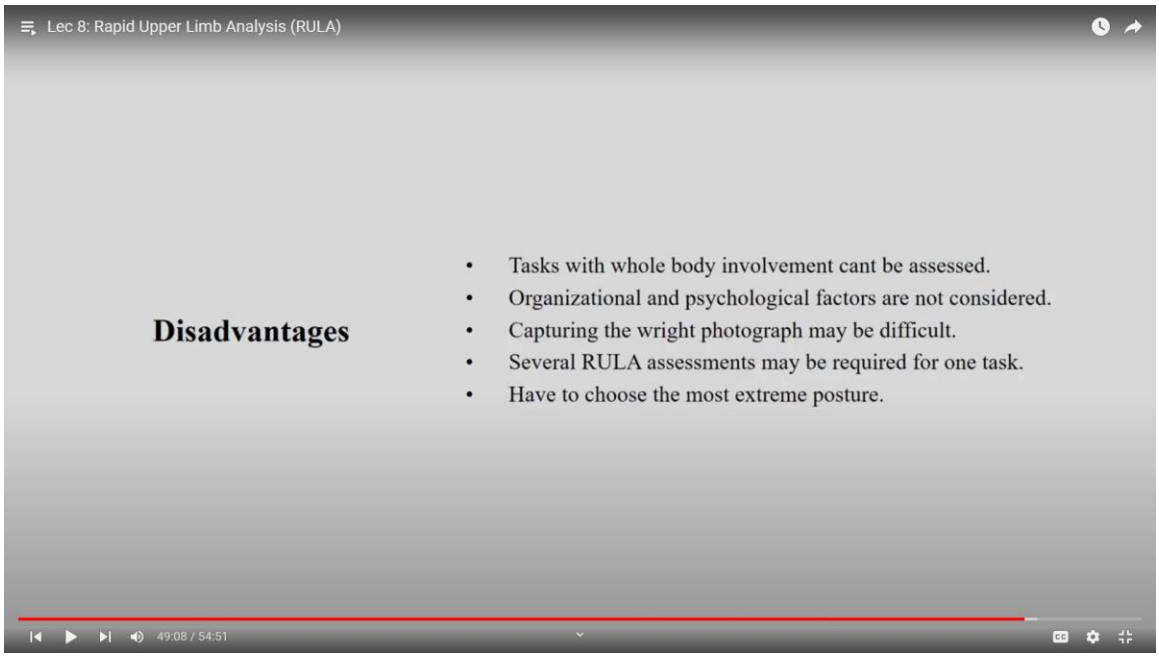
we use RULA. Now, let us understand. So, this is the kind of action level that needs more detail. So, as I mentioned earlier also, 1 to 2 is negligible risk, 3 to 4 is low risk, 5 to 6 is medium risk, and more than 6 or near 7. These are all very high risks and need immediate implementation.



So, let us understand the advantages of this particular tool. So, the relation between the score and regional pain can be demonstrated. Suppose from an initial survey that you have an idea that, yes, the prevalence point prevalence or weekly prevalence is neck and neck pain, which has these types of symptoms. So, they are showing, and from the postural analysis, that the neck is the major contributory factor to the higher risk value.

So you can easily correlate them. So, the relation you can establish. Outcomes like productivity and suitability of the equipment can be evaluated because if the posture is not optimum, then it is definitely going to affect the productivity of the whole system, the suitability of the whole system. So, you can really evaluate the system based on this whole analysis. So, workers can be educated regarding high-risk posture. So, if you can explain to them and show them these data, they will definitely be able to understand how they should correct their working posture and how they maintain good working posture habits.

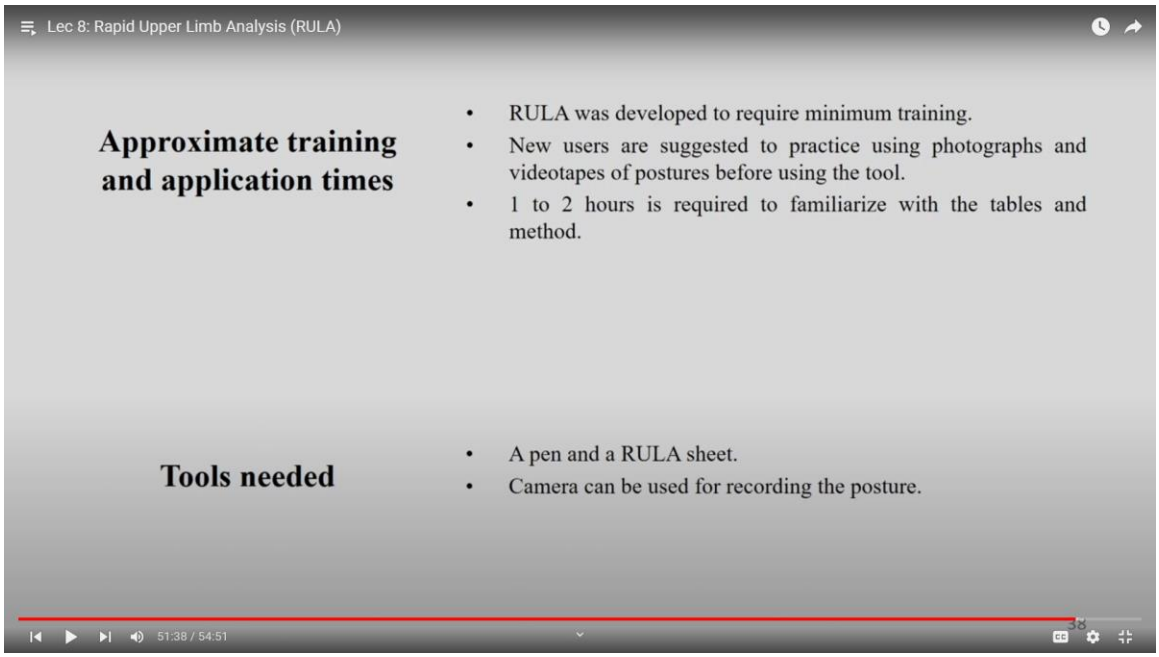
Comparison can be made between the pre and post-intervention; it is very easy. So, if you have a grand score value of 7 or 6 and then after intervention, it is 5, you can easily say how it has been improved, and it is very quick and easy. So, these are the advantages. However, there are some disadvantages. So, this task with whole-body involvement cannot be assessed.



It is only some upper arm and lower arm, so upper limb, neck, trunk, and leg. So, the leg also has a very limited contribution. Organizational and psychological factors are not considered; only the physical position is considered. Capturing this spelling is wrong. Considering the right photograph may be difficult because, in working conditions and the working environment, getting the correct photograph is very difficult. So, if the photograph is not really correct, if there is some parallax error, you will not be able to assess the proper degree of movement, then it is going to give some kind of wrong interpretation of the posture.

So, collecting data, like collecting the proper photography, is very, very important in this case. Several RULA assessments may be required for one task. Of course, for a whole job, for a whole task, it is not that only a single posture is being adapted; it is, it may require 4, 5, 7, or 8, depending on the complexity of the task, a lot of, lot many postures. So, each posture needs to be assessed separately using RULA. You have to choose the most extreme posture because that gives you an understanding of how dangerous the whole job is.

So, if you can address the maximum risk, of course, the other risk also will be taken care. So, but at what level may we not understand from this RULA? So, these are the disadvantages of this particular tool. It is very, very easy, I believe, during the course, during this class only; if you had tried, you would have learned this particular tool. So, it is a very, very easy tool.



So, RULA was developed to require minimum training because very little training is required. Only if you understand the movements and the body position can you easily get the scoring. So, new users are suggested to practice using photographs and video, such as videotapes of posture, before using this actual tool, and 1 to 2 hours is required to familiarize themselves with the tables and the method. I think less than that also is easy. So you can understand tables better, which is not that critical.

You can easily adapt to the situation, and you can continue with the final scoring. So, you need only pain, a videography system or photography system, and the main RULA sheet where you have the description of all the parts and all these pre-computed tables. So, these are only the requirements. So, anybody can use this particular tool with minimum understanding, and they can identify or assess the kind of risk for the development of musculoskeletal disorders from the posture point of view. Here, again, I would like to mention that posture is not only a factor that affects musculoskeletal disorders but also very awkward posture. If it happens once in a whole shift, it may not be that dangerous, but some less awkward posture that continues for longer hours can cause more damage.

So, posture is always associated with the duration of exposure. So, posture may not be the only individual factor that is causing or which is the causal factor of the musculoskeletal disorder. So, along with the RULA assessment, and RULA score, you should look for the duration of total exposure. So, you must have learned this tool very well, and it is very, very easy. So, I suggest just you pick up your camera, you have

mobile phone, you take any working posture which is you know you can see around and you practice at least one or two photograph analysis, you will learn the tool.

If you still have some doubts, we can discuss them in the discussion section. So, we will be talking about REBA, which is a rapid entire-body assessment, in the next class. Thank you.