

# Scientific Method: Changing One Variable at a time

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A variable is a termed used in the scientific method to evaluate changes. There are variables that cannot be changed or manipulated such as your age and your height. Other variables can change such as pain, strength, and ability to function. This type of variable is considered a “Dependent Variable” as it is something that can be observed. We can ask you how much pain you have and typically this is easiest to use when using a number scale such as 0-10 with 0 being no pain and 10 being the worst you can imagine or pain that would take you to an emergency room. This 0-10/10 scale can be used for all types of subjective complaints such as numbness and tingling, fatigue, or anxiety for example. The scale is almost always used with 0 being the bottom of the scale or no problem, and 10 is the top indicating the worst possible feeling. Other dependent variables are things that we can observe with our eyes or measurement tools such as using a protractor to measure the range of motion available in a joint. With the arm down at the side of the body this is considered 0 degrees. When the arm is held up straight out from the body the angle of the body to the arm would measure 90 degrees and when the arm is all the way up with the elbow next to the ear on the head this measurement is 180 degrees. Commonly a therapist will measure this range of motion and ask for your pain level while making this movement. This would be observing 2 dependent variables in one task.

Another type of variable that can be changed are actions that can be taken such as taking medications, using compression socks, doing an exercise, or undergoing surgery. This type of variable is considered an “Independent Variable” or something that we try to change or perform.

The last type of variable is a “Controlled Variable” or something you try to keep the same. An example would be to always put on a compression stocking that is clean, or to put the stocking on first thing in the morning. Another controlled variable would be to take the same amount of medication each time.

Using a combination of these types of variables is the most efficient way to determine how something is behaving. When a person has back pain that is 7/10 during walking, this gives us the dependent variable of pain 7/10 with the controlled variable of pain during walking. So we want to go back and check the pain level in walking each time. If the next time we compare pain in sitting we have changed the variable and it is no longer valid in our scientific experiment. Using the 7/10 pain in walking we can now add the independent variable of using Releasing Joint Restriction (RJR) joint alignment and pain relief protocol of changing positions of the body. The next variable that changes is time. By staying in a specific position for a given period of time (most people require 90 seconds) you can then return back to a straight or neutral position and the dependent variable of pain during walking is now assessed. If the pain during walking is now 3/10 reduced from 7/10 then you can determine that the reason this improvement occurred was because of the position you just held for 90 seconds.

This is an example of changing only one variable at a time. If you treat with one specific position or stretch and then recheck the dependent variable of pain with the specific position or gesture you found to previously be painful this will tell you if you made a change. Sometimes the change can be that you feel worse especially somewhere else. This finding does not indicate that the technique was not beneficial-it may have been beneficial for one joint but now another joint is screaming that it too wants a turn to be released or unlocked.

By using this scientific method and changing only one variable at a time you can determine for yourself what methods are effective. However, if you change too many things at once it is very difficult to determine which thing caused the problem. For example if you have a car accident and then you start working with a chiropractor, massage therapist, acupuncturist, medical doctor, and a physical therapist all at the same time, it is very difficult to determine which method is making you worse or better. If you apply one method and determine the results from that method you can more clearly see the best approach for you. It is best to add one thing at a time. If you start with a chiropractor and you see good benefit for a day or so but it continues to come back, after a few weeks you will have a good sense of how this is working for you.

If you then add the physical therapy approach this will be the new variable you are adding and then you can see how that new variable is working for you. As long as you change one variable at a time and really see the changes with each thing you do differently you will be able to make very good decisions on the best path for you to take to control your symptoms.

Using chemistry sometimes the outcomes are not obvious for you. For example if you take medication for high blood pressure-you might not be able to tell the difference with them or without them. Your doctor can tell by taking a reading with a blood pressure cuff. If you are taking your medication and your blood pressure is still high they might add another medication or ask you to lower your salt and start exercising. In this situation is really is best to try to throw all of your best efforts against the kitchen wall and see what sticks because high blood pressure is dangerous and can lead to a heart attack or a stroke. It has been proven through the scientific method that diet and exercise are definitely variables that can improve high blood pressure so those would be good to add with the medication. It is quite dangerous to stop these medications without the approval of your doctor because you might not be able to recognize a problem until it leads to a heart attack. If you choose to not diet and exercise and remain overweight then you are choosing to risk a heart attack or stroke. We do not like to admit that this is a choice but it clearly is even though it is a difficult truth. If we are willing to put up with the long term outcomes of our behaviors we have to take this responsibility as well.

Using this approach of changing one variable at a time is very good with any behavior you want to change. If you want to have more peace in your house try changing one variable and improve your tone by smiling when you talk. If this is the only variable you change and there is more peace then you can say this made a difference. To be certain that this smiling thing is what made the difference, if you stop it and things get worse again, resume smiling. If things improve with the smiling and worsen without the smiling and this is the only variable that changed, it is it is most likely the smiling. Then you decide: if you like the benefits that you achieved with the smiling then keep doing it. But if you do not like the outcomes you achieved with the smiling then stop.

It is the same with physical pain. If you like how your legs feel when you wear your compression stockings and you do not like how they feel when you don't have them on then keep wearing them. If you notice that your back or shoulder pain improve when you do your Releasing Joint Restriction alignment technique and you feel so much better you forget to do it and the pain comes back. Resume doing the exercises. If you stop holding your pelvic floor to keep your body alignment in good shape and you start noticing you are waking at night to go to the bathroom-this is a choice you're a making by forgetting to do the exercise that you like getting up at night to use the bathroom. Behind a weak pelvic floor comes weakening of muscles and therefore joints sliding out of place which leads to pain. If you choose not do to the exercises, then you are making the decision that you prefer the pain. It is all a big menu. Choose the dish you like: pain or none; sleeping through the night or waking to go to the bathroom several times; or remaining in your own home versus getting to live in a nursing home, and enjoy!