

Dynamic and static asana practices

There are two possible methods in the practice of asanas: Static and dynamic. Static here means maintaining the final position of asanas for a period of time (say, 1–3 min), and dynamic would imply move in and out of the final pose in quick succession. In exercises also, we have these two ways of carrying out an exercise regimen. While exercise, physiologists recommend different ways of executing exercises based on a person's requirements; similar consideration should also steer what types of asanas a person should carry out and whether to do them statically or dynamically. Each has specific benefit with respect to neuromuscular rehabilitation.

The main component of asana practice is stretch of muscles. Muscle physiology has much to offer in terms of understanding benefits of muscle stretch. Here again, the stretch could be either slow or fast; further, the stretch could be maintained for a short period or not. These combinations are of interest for achieving the goal of rehabilitation. Even for maintaining proper muscle control (especially as one gets to postprime years), these practices are important as presented hereunder.

MUSCLE STRETCH

Muscles are built for weight bearing and movement. Thus, stretching a muscle is going against its grain, so to say. If the stretch is beyond normal, the muscle or more likely, the tendon connecting the muscle to a bone, could rupture. Tendon rupture is difficult to repair; self-repair is slow since blood supply to the tendon is poor (hence, its white appearance). Hence, the muscle/tendon pair tries to protect itself from overstretching and rupture. This is achieved through feedback mechanism within both the muscle and the tendon.

Usually, muscle is activated by a group of nerve fibers – arising from the brain and spinal cord (efferent) – that sends a volley of electrical impulses to act in a coordinated and smooth fashion. The efferent fibers originate in the brain and terminate in the spinal cord (upper motor neurons) and then travel from spinal cord to neuromuscular junction (lower motor neurons). There are also many nerve fibers that take information back to the brain via the spinal cord regarding the status of the muscle (afferent). This feedback provides information to the brain regarding the amount of stretch of the muscle, how fast it stretches, and how long the stretch is maintained.^[1] All these three aspects of muscle activity could be accomplished in the

practice of asanas. If coordination is lost due to some trauma (for example, a brain injury), the muscle could exhibit one of three distinct problems: (a) It could become flaccid or has decreased strength (as in a stroke patient); (b) it could become rigid (as in spasticity); or (c) it could lose coordinated function (as in Parkinson's tremor). In the case of muscle weakness, we need to strengthen the muscle. This is called facilitation. In the case of muscle rigidity, we need to reduce the activity of the muscle. This is known as inhibition. In the case of erratic behavior, the muscle should be brought under smooth control.

All these could be achieved through proper utilization of asana practices. These are guidelines available for such modulations in asana practice, and one should resort to a qualified therapist for accurate results, since muscle impairment could be complicated due to multiple factors.

Feedback mechanisms in the muscle fibers and in the tendon connecting the muscle to the bones are activated through stretch achieved in asana practice. Thus, it is seen that asana practice is important in achieving rehabilitation of neuromuscular problems. This might seem simple; however, the physiology is fairly complex. The amount of stretch could also be monitored through H-reflex monitoring that is seen as a late component in electromyogram studies. Studies conducted to examine muscle stretch through H-reflex gives an idea of the amount of reflex recruitment and the integrity of the feedback mechanisms in the muscle.^[2,3] A muscle without any feedback is, fortunately, rare; such a muscle is very difficult to manipulate through the methods of a stretch.

Stretch could be passive (activated by a therapist) or active (carried out by the patient). Active stretch is always more effective even if carried out minimally by the patient. Perhaps in some severe cases, it is necessary to carry out the procedure in a passive manner and then, when the muscle has improved in its ability to contract, let the patient recruit the muscle in question without the therapist's help. In normal exercises and even in sports, one aims to develop strength of the muscle through contraction of the muscle. In Yoga, in contrast, the muscle is stretched – fast or slow – in a systematic manner. In Yoga, further, many skeletal muscles undergo stretch, thus providing a global improvement in control. In sports, usually, only certain muscles pertaining to that sports

are activated in preference to others. Sports medicine is realizing the importance of stretch of a muscle for protecting it from damage due to overuse. There is, thus, a fundamental difference between exercise and Yoga practices.

Further, it is important to perform asanas bilaterally; this means the person should perform asanas using both left and right limbs. If one set of limbs (say, right limbs) is not strong enough or have a tremor, the asanas should be performed actively on the normal side first and passively on the weaker side later. This is important because an interhemispheric connection in the brain will carry information of activity of one side to the opposite side. Central integration will carry over to the weak side, so the therapy will be more effective than doing asanas on one side only. Brain is always “awake” to all types of input from the periphery. Muscles are grouped according to their ability to move joints in a particular direction. Muscles in the front are called extensors, those in the back are called flexors; on the other hand, adductors are located on the inner aspect and abductors on the outer aspect. These group of muscles either straighten, bend, move joints inward or outward, respectively. It is important to stretch these various groups of muscles to prevent imbalance. Hence, a proper sequence of recruitment of skeletal muscle is important for rehabilitation. In short, it may be said that muscle stretch as practiced in Yoga asanas provide control to the muscle; muscle activity in sports provides muscle strength. Needless to say, muscle prowess without control could be self-defeating; muscle control without strength is a weakness that should be avoided. Thus, the role of Yoga asanas in rehabilitation and as a complement to strength building measures such as exercises cannot be overemphasized.

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION AND YOGA ASANA PRACTICE

Proprioceptive neuromuscular facilitation (PNF) is an interesting technique of stretching a group of muscles for enhancing the range of motion as well as for improved motor activity in a person. The target muscle is stretched through contraction of the opposing muscle. This is followed by isometric contraction of the target muscle. This technique can easily be incorporated in asana practice also.

There are some interesting applications of PNF that could be brought to asana practice. The facilitation and inhibition methods, suggested in the earlier paragraph, are related to the applications of PNF techniques. Integrating these ideas into a Yoga therapy program

is important. There seem to be some attempts of this in the practice of asanas in normal individuals.^[4] This method facilitates one to relax a stiff muscle and carry out the pose more completely. The author says, “Facilitated stretching involves contracting a muscle that you are lengthening. This increases the tension at the muscle-tendon junction and recruits more Golgi tendon organs than does stretching a muscle alone. Facilitated stretching causes the spinal cord to signal the muscle to relax, in essence, creating ‘slack’ in the muscle. You can then take up the slack to move deeper into the pose.”^[4]

One study provides evidence that physical exercise induces oxidative stress.^[5] While this might be true for intense exercises, asana practices are usually of mild to medium intensity only, and hence this problem may not occur under normal practice conditions. Even intense Yoga asana practice comes under low caloric impact; hence, this problem may not be seen in any type of asana practice.

CONCLUSION

Therapeutic Yoga is an interesting application of asana, pranayama, and meditation practices that could bring much needed homeostasis to the body-mind complex. There is a saying in Sanskrit that is summarized as follows: Performance of dharma is possible through the activity of the body alone. This means that the body-mind should be in good shape to carry out our designated dharma. Dharma, in its turn, sustains our material substratum so that we could proceed further in this question for the infinite.


A question arises if yama and niyama – the first two steps of Yoga – are mandatory for proceeding to asana and other aspects of Yoga. Some may say, it is necessary to go one step at a time. This could be an impractical approach, especially when one has pain in body and mind. We have seen often that when a person practices some angas of Yoga sincerely, there is an automatic readjustment in the insight and outlook of the practitioner. Realigning the subtle energies in the body, developing equanimity, and compassion through meditation seems to give feedback to the brain and body so that there is an overall reorganization of our thinking and attitude. The practice of the precepts of yama and niyama comes naturally to the person. This is the observation of many Yoga teachers over the years. Thus, Yoga asanas, pranayama, and meditation practiced in an enthusiastic and dedicated manner seems to help a person in attaining peace and spread this peace and Ananda around him/herself.

TM Srinivasan
 Division of Yoga and Physical Sciences, Swami Vivekananda Yoga
 Anusandhana Samsthana, Eknath Bhavan, 19 Gavipuram,
 KG Nagar, Bengaluru - 560 019, Karnataka, India
 E-mail: editor@ijoy.org.in

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

REFERENCES

1. Harris FA. Facilitation techniques in therapeutic exercise. In: Basmajian JV, editor. *Therapeutic Exercises*. 5th ed. NY: Williams and Wilkins; 1990. p. 93-137.
2. Srinivasan TM. *Yoga Sagara Saram*. Bangalore, India: Swami Vivekananda Yoga Prakashana; 2011. p. 169-86.
3. Capaday C, Stein RB. Difference in the amplitude of the human soleus H reflex during walking and running. *J Physiol* 1987;392:513-22.
4. Available from: http://www.bandhayoga.com/keys_PNF.html. [Downloaded on 2015 Oct 25].
5. Leaf DA, Kleinman MT, Hamilton M, Deitrick RW. The exercise-induced oxidative stress paradox: The effects of physical exercise training. *Am J Med Sci* 1999;317:295-300.

Access this article online	
Website: www.ijoy.org.in	Quick Response Code 
DOI: 10.4103/0973-6131.171724	

How to cite this article: Srinivasan TM. Dynamic and static asana practices. *Int J Yoga* 2016;9:1-3.

“Quick Response Code” link for full text articles

The journal issue has a unique new feature for reaching to the journal’s website without typing a single letter. Each article on its first page has a “Quick Response Code”. Using any mobile or other hand-held device with camera and GPRS/other internet source, one can reach to the full text of that particular article on the journal’s website. Start a QR-code reading software (see list of free applications from <http://tinyurl.com/yzlh2tc>) and point the camera to the QR-code printed in the journal. It will automatically take you to the HTML full text of that article. One can also use a desktop or laptop with web camera for similar functionality. See <http://tinyurl.com/2bw7fn3> or <http://tinyurl.com/3ysr3me> for the free applications.