1. Major surface muscles located in the body

The occipitofrontalis or the epicranius covers the forehead and it raises the eyebrows in surprise. Its origin is the occipital bone and its point of insertion is the tissues of the eyebrows. An exercise for this muscle includes placing a finger on each eyebrow and pulling down slightly, followed by raising the eyebrows against the weight of the fingers. The corrugator supercilii helps in frowning. Its origin is the frontal bone and its point of insertion is the skin of the eyebrow. An exercise for this muscle includes placing four fingers on each eyebrow and pulling them away from each other. The orbicularis oculi helps in blinking. This muscle encircles the eyelids. An exercise for this muscle is closing each eye alternately. The orbicularis oris and the buccinator muscles help in kissing. The orbicularis oris encircles the mouth. The origin of the buccinator muscle is the maxillae and its point of insertion is the skin of the sides of the mouth. An exercise for both these muscles is hooking a finger at the corners of the mouth and pulling away from each other. The zygomaticus major helps in laughing. Its origin is the zygomatic bone and its point of insertion is the angle of the mouth. An exercise for this muscle is placing fingers beneath the eyes and smiling against the weight of the fingers.

The sternocleidomastoid muscle has its origin in the sternum and clavicle and its point of insertion is the mastoid process of the temporal bone. It helps in flexing the head on the thorax. The neck retraction exercise helps in strengthening this muscle.

2. Levers of the musculoskeletal system

In first class levers, the fulcrum lies between the effort and the load. The first class levers of the body include the head being raised and the head being tipped backward on the atlas. In second class levers, the load lies between the fulcrum and the effort. The second class levers of

the body include raising the body on the toes and opening the mouth against resistance. In third class of levers, the effort lies between the fulcrum and the load. The third class levers of the body include flexing of the forearm at the elbow joint, pinch grip of the fingers, flexion of the knees, biting using the front teeth, and adduction of the thigh using the hip joint. These are the most common type found in the body.

Examples of exercises for the third class levers in the body include biceps curls, seated and lying hamstring curls, seated leg extensions, dumbbell flyes and shoulder dumbbell front and lateral raises. The biceps curl is performed in the sagittal plane which is a vertical plane dividing the body in right and left parts. The hamstring curls and seated leg extensions are also done in the sagittal plane. The dumbbell flyes are performed in the frontal plane and around a sagittal horizontal axis. The frontal plane passes through the body perpendicular to the sagittal plane. During the shoulder dumbbell front raises, the humerus moves in the sagittal plane and during the shoulder dumbbell lateral raises, the humerus moves in the frontal plane.

3. Exercise equipment

Some common pieces of exercise equipment include barbells, dumbbells, cable and pulley system, offset cam, elliptical pulleys, Keiser resistance machines, mini-gyms, ergometers, treadmills, metal springs, powerlifting gear, Smith machine, power racks, resistance bands, and leg press machine. Of these, barbells, dumbbells, and cable and pulley system use constant resistance, offset cam and elliptical pulleys use variable resistance, Keiser resistance machines, mini-gyms, ergometers, metal springs and powerlifting gear use accommodating resistance, and Smith machine, power racks, resistance bands, and leg press machine use static resistance.

Most equipment found in gyms belong to the variable resistance equipment category. This is because the muscles are worked to their maximum extent through their complete range of motion. It is also very good for muscle growth. However, it has several disadvantages. It does not provide a natural feel to the body and hence, can transmit unclear signals to the brain regarding force and movement. As it lacks the use of stabilizers, it is not highly recommended for athletes.

Hence, gyms need to replace variable resistance equipment with constant, accommodating and static resistance equipment due to their several advantages. The constant resistance equipment are more natural and turn out to be more beneficial in the future. It also contributes to greater overall strength. Accommodating resistance equipment help users to apply the maximum possible resistance through the complete range of motion, hence placing maximum stress on the muscles. Static resistance equipment is also called isometric training where the muscles are contracted without movement. Each of these types of training equipment need to be used in balance to achieve complete workout for the muscles.

4. Periodization

Periodization is a systematic approach to fitness routines which involves targeted involvement in various activities of a training program in a specific period of time. It enables a person to understand and develop healthy habits and regular workout timings to ensure success of their training. The major components of periodization are frequency, intensity, duration and volume. Frequency is how often a particular activity needs to be repeated. Intensity is a measure of capability of a person in his/her choice of exercises. Duration refers to the time period of one complete cycle of training and knowledge acquisition. Volume refers to the amount of knowledge and skills retained in one complete cycle.

There are oftentimes instances when people might choose to undergo cycles of periodization. A veteran international-class athlete who has recently won a world championship medal may choose to undergo periodization for the competitions going to be held in the coming year. Similarly, martial artists may indulge in one, two, or three cycles of periodization based on the upcoming competitions within the next few months. Athletes training in rugby or soccer may use this strategy to build their strength in the preseason and maintain it up to 35 weeks.

Periodization is beneficial for everyone and not just for athletes. It is slowly becoming a popular form of training as it offers many benefits over the standard training programs. It allows the body to develop progressively without giving it a sudden shock. Also, it allows a person to slowly reach the peak right before a specific event. Continuous change can also keep the user engaged and interested in the sessions.

5. Supplements

Given below is a list of top 5 supplements in the market that I researched and their related studies:

- Creatine – it is used primarily as a supplement for ATP which provides the energy source for all muscular activities. About 500 research studies have been done to understand the necessity of taking creatine supplements, especially for athletes. As many as 70% of the studies conducted indicate positive benefits of taking creatine. However, no study has mentioned any negative effect of this supplement. Its positive effects include increasing strength, amount of fat-free mass and performance of exercises. This research has been published in the journal, Molecular and Cellular Biochemistry which is a credible source (Kreider 2003).

- Casein-whey protein supplements – it helps in promoting a balance of nitrogen in athletes. Studies regarding the combined usage of casein and whey in a single supplement has been conducted by institutions like Baylor University, Mayo Clinic, and University of Texas Medical Branch. All studies indicate that the combination of casein and whey is extremely beneficial for muscle growth, at the same time aiding loss of body fat (Stoppani 2015).
- Omega-3 fatty acids – this supplement is extremely good for the brain and also prevents certain types of cancers. According to studies conducted by the AHA Science Advisory "Fish consumption, fish oil, lipids, and coronary heart disease", omega-3 fatty acids is highly beneficial for people's heart health. Its effects on cardiac function, hemodynamics and arterial endothelial function have been widely researched and asserted. These results have been confirmed by studies such as the Chicago Western Electric Study and Nurses' Health Study (Kris-Etherton 2002).
- Antioxidants – these are most widely known for clearing toxins from the body. However, the benefits of this supplement have been overhyped. Clinical trials conducted to explore the health benefits of antioxidant supplements did not provide a very good picture and some studies have reported no real benefit from taking these supplements. However, this is a growing industry and the hype created by media has encouraged a lot of people to begin using it (Antioxidants: Beyond the hype).
- Fiber supplements – often, the consumption of fiber in one's daily diet is not enough and athletes might require fiber supplements to bridge their needs. It protects against high blood pressure and lowers inflammation in the body. Studies conducted by institutions like the University of Maryland Medical Center and the Vanderbilt University have shed

light on the benefits of fiber supplements in people who consume an insufficient amount of dietary fiber. However, all studies have stressed the fact that people should talk to their doctor before beginning fiber supplements (Ehrlich 2015).

6. Stability ball exercises

For the group of chest muscles, I chose to perform the dumbbell chest press on ball. For the lat exercises, I chose to do the supine pullover on ball. For the triceps exercises, I chose to do the one arm dumbbell triceps extension on stability ball. For the biceps exercises, I chose to do the dumbbell hammer curl on ball. For abdominal muscles, I chose to do the oblique stability ball crunches. For leg muscles, I performed the ball leg curl. For back muscles, I performed the ball bridge. For shoulder muscles I performed the ball shoulder rotation. For each of these exercises, I found that it was quite difficult to apply complete resistance or complete weight as compared to normal. I guess this is because a stability ball requires more resistance to maintain stability and perform exercises.

Stability ball exercises are especially beneficial for athletes as they help in building greater strength and balance of the body. It is useful for both men and women and people of all ages. It is also being considered that stability balls be used to replace chairs in offices and schools for greater concentration and focus. It may also be used to aid the process of labor during childbirth.

Stability ball training is contraindicated for people who are new to resistance training. This is because they first need to get used to the concept before beginning something more difficult. People who have joint injuries or muscular strain should also avoid these exercises. Ball exercises are not recommended for people trying to build strength, power and muscle.

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