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Lecture – 01 Part b Skeletal System

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So, the skeletal system has various functions. The functions of the skeletal system what does it do it provides the internal framework for the body. It is what gives it the structure to the body right. Your body is shaped a certain way because of this rigid skeleton that is inside. It also therefore provides support to the body. It is what takes the external loads like gravity right. It is it also protects the various internal organs of the body. You have you know all your internal organs, your heart, your lungs, your digestive system all those other organs of your body are housed within this skeletal system. It sort of provides like a cage a protective cage for your organs.

Then we talked about you know what causes the various parts of the skeleton to move are the muscles, so where will the muscles attach they also attach to the bones to the skeletal system. So, the skeletal system provides various points for the muscle to attach. So, provides points of muscle attachment. And it also has other functions like it is a living organ, so it produces blood cells and stores minerals and it performs other functions in the body as well. We will be concerned with the actions of the skeletal system with regards to movement in this particular course. So, when we are talk about the organs of the skeletal system, the two parts of the skeletal system are you have the bones and you have the joints right. The bones are the rigid members; the joints are the places where they come together because that is what allows the movement. So, they are connect to each other about 205 bones in the body for an in adulthood. As children you actually have many more bones, but as you grow older the bones fuse together and adults will have typically two total of 206 bones in the body.

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So, bones are connected to each other to form the skeletal framework. And joints are the places where two bones meet. In the human body, the joints are held together by I mentioned this earlier ligaments. The joints are held together by ligaments and they give flexibility to the skeleton. The bones are also called osseous tissue, and they made of one of the hardy hardest materials in the body; and it is formed by a process that is called ossification.

So, initially when we are in the fetal form you know as a fetus its mainly cartilage it is all flexible tissue and that is gradually replaced by more immature bone cells which finally, become which become mature in mature into osteocytes which are the which form the bones. So, the formation of strong bones, so it actually you know from cartilage to osteoblasts to osteocytes in adults. So, to form strong bones, you need adequate minerals

in the body which is why a good diet is necessary and bones also because bones are living tissue they also respond to stress.

So, if you do not exercise, if you do not load your bones, then the bones become porous and weak that is why you are asked you know in the human body a lot of it works that way if you do not use it you lose it ok. So, it is very important that you know the reason exercise is very important is that otherwise the bones thing so the bones if they have to do you know if they have to support loads, then they keep you know they stay strong, they keep the otherwise they just sort of start disintegrating to some extent, they become porous and they become weaker that is why it is a natural process that happens with aging in the bones start losing some of them minerals and become weaker.

But if you continue the reason you know even elderly people are asked to walk regularly or you know do some form of gentle exercise is to maintain this bone health because without that then they become more prone to fractures. One of the reasons elderly people get their bones fractured easily is because you know with ageing the bones start losing the their strength. So, one of the ways to maintain it is through exercise and of course, a good diet ok.



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So, if you look at the skeleton, here are some of the, what view would this would I call this one this view on the this is a view in the frontal plane, and this view is the anterior view of the skeleton. I am looking at it from the front the front view is the anterior view.

This is you can see the back of the head this is the posterior view of the skeleton. So, some of the bones that we will encounter again and so you can see here this skeleton has like a central part, you have the head the neck you know the chest part of it. So, you have the you know which the thoracic part, then you have the spinal column here and then you have the hip the pelvis. And then you have to this part is attached the arms, you have the arms attached at the shoulder and then you have the legs attached the skeleton at the hip. In fact, when they assemble this skeleton that was more or less how it was assembled. So, you had the head this part of it separately, then the arms and the legs were then attached to this central portion ok.

In this of course, this is not this does not give you a true picture of the joints because instead of ligaments you actually have mechanical fastening at each of these joints. So, you may not have the same kind of motion at these joints as you do in the human body. And we will look at you know we will go through the skeletal system from top to bottom to study some of the major bones.

So, you have here you have the skull then you have the spinal column which consists of various vertebrae, then you also have the ribs you have what is known as the sternum for the breast bone in the front and then to which are attached the ribs the ribcage is attached to the sternum in the anterior side. Then you have your upper arm which is called that bone is called the humerus and then in the fore arm.

Forearm is the lower part of the arm, you call that the forearm, you have two bones called the radius and ulna ok. Then you have the pelvis and then to the pelvis are attached you have a big bone called the femur which is your thigh bone. And then below the femur comes the tibia; the tibia sometimes is also called the shank. And there is also another long bone by the side of it called the fibula. And then you have the bones of the hand and you have the bones of the feet.

So, you have you know the hands and feet are actually made up of many, many bones, you have multiple bones they are not made up of and that is the reason you have you can do so many different things with your hands because it gives you so many ways you can move the bones relative to one another. A lot of your dexterity comes from the fact that you have a number of bones in your hands.

In the feet it is more of you know it can adapt very well when you walk you know even on uneven terrain, you know if you can you can walk on rough surfaces and it will still adapt very nicely because of the fact that it is made up of multiple bones instead of a single solid bone that lends flexibility of movement. So, this is just the and couple of other important bones you have here your clavicle or your collarbone this is your collarbone. And then you have at the back you can see in the posterior view, you can see this bone that is called the scapula this is what we normally refer to as the shoulder blade. You can see here me see if I can move this to get give you a look of the posterior view, you can see this is the shoulder blade. You can feel this part is called the we call that as the shoulder blade.

So, this is the scapula the vertebrae, they form the spinal column. So, they made up of many individual bones that are put together to form the spinal column. So, you have many bones here in the vertebrae sorry in the spinal column each one of them is called a vertebra. So, the spinal column extends up to where it the pelvis comes.



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So, you have what is known as the sacrum here that articulates with the pelvis. So, the skeletal system can actually be classified into two parts. So, you have what is known as the axial skeleton and then so the axial skeleton along the axis the central part of the skeleton is called the axial skeleton. And then you have what is known as the appendicular skeleton. So, to the axial skeleton, you have some bones appendages, you

must have heard the word appendages these are some extra things that are attached right. So, the arms and the legs are the appendages that are attached to the central axial skeleton, and therefore, they form part of the appendicular skeleton.

So, in the axial skeleton, you have the skull, you have the spinal column or the vertebral column, you have the ribcage these all form part of the axial skeleton. And in the appendicular skeleton, you have what is known as the shoulder girdle because that is the part that connects the appendages to the axial skeleton. So, it is like the framework for the arms to connect which is formed by the clavicle and the scapula.

So, you have the clavicle and the scapula which form the shoulder are also known as the pectoral girdle pectoral girdle or shoulder girdle. And then of course, you have the arm and the hand and then in the lower part of the body the pelvis the pelvic girdle is a set of bones that form the you know that attach the legs to the rest of the to the axial skeleton. So, you have the pelvic girdle and then the legs and the feet.