

The Relevance of... Ribs

Talk of 'good ribs' is probably more likely to make people think more of summer barbecues than their last - or next - bodywork treatment. In teaching students about the bones they are typically one of the first mentioned and already known about.... and often then denied much further discussion. I have been guilty of this too in the past, grateful that there was only one name to remember for 24 bones! (I also want to clarify here that men and women do indeed have the same number of ribs on both sides of their body... the story that suggests otherwise is possibly metaphoric but definitely not an anatomical fact... I have been asked about this many times over the years...)

Anyway, these ribs are in fact worthy of much more consideration... Why? Well, not least because there are at least 82 small joints associated with them - more if you consider the joints of the mid-thoracic ribs with two of the vertebral bodies as two. How do we get to this number? Ribs 1 to 10 all attach to a piece of cartilage at the front. This piece of cartilage from ribs 1-7 attaches to the sternum. Ribs 11 and 12 are floating ribs so don't attach at the front, but all of the ribs at the back articulate with both the transverse processes of the vertebrae as well as the body of the vertebrae.

As I mentioned, ribs 2-9 have their joint positioned over the edge of the vertebral body below as well as the one above with a ligament bisecting the joint, so this would then bring our total up to 98... Don't you think the sternoclavicular joints and manubrio- and xiphi-sternal are also important enough to include? You can see why it may be worth delving into this area of highly moveable features despite the small range of movement available to each individually.

All of these small joints have the typical features of synovial joints - many connective tissue fibres of the joint capsule, running in many directions, synovial membranes lubricating the inside of joint surfaces and intimate connections with other ligaments in the area. Thus the boney structure should be well aligned for optimum function.

Not only that of course, but there are also layers of muscle in between each of the ribs - the external and internal intercostals and, some researchers have suggested, some 'innermost intercostals', more evident in the middle - ribs 3 - 9, which are thought to act with the inner intercostals. The external intercostals are important in elevating the ribs upwards and outwards in inhalation, expanding the size of the thorax and reducing its air pressure so that air will 'rush in' (to equalize with the outside air pressure), at the same time providing the perfect opportunity for our important gas exchange. In with the oxygen, out with the carbon dioxide... The internal intercostals have their moment only when we need to actively breathe out, helping to return the ribs downwards thus forcing air out.

The inside of this thoracic 'cage' contains the lungs, lined specifically by the outer parietal pleura, which 'sucks' the inner visceral pleura to it by virtue of a thin layer of fluid; this visceral pleura is intimately connected to the lung tissue itself so that the outer edges of the balloon are held in place and enable ventilation (*movement* of air in and out). There is also a connection to the heart via a sternopericardial ligament, and the pericardium sitting directly against the thoracic wall on the lower left side of

the body of the sternum and the sternal ends of the 4th and 5th cartilages of those left side ribs.

All of this 'structure' obviously has direct interplay with the function of breathing. Many physical 'insults' can affect groups of these joints and structures, possibly disturbing the correct balance. Since the ribs are connected at the front *and* back of the body think about the myriad of ways the body could move on receiving trauma and also how it may adapt at these joints in patterns of compensation as time goes on.

Yet breathing also directly mirrors even more of our 'beingness'. Our emotions and feelings are reflected in our breathing, from moment to moment: remember the difference you feel after a good laugh or cry? Or the negative impact of a stressful or fearful experience? If negative emotion is experienced over time then breathing patterns can change which can impact the structure and anatomy of the thorax, potentially leading to longer term disturbances and problems. For example, working with a client recently it transpired that a childhood fear of the dark was emotionally relevant to the distortion and tightness experienced in the ribcage. Physical adaptation had been made for emotional reasons and releasing some of the tension in the skeleton also released some of the emotion.

So to see how important these 24 flat, curved bones are, take the basic boney anatomy with its 100+ joints, mix in connective tissue, combine with some muscles, blend in a couple of organs and emotional experiences (especially fearful ones). Then, add to this a mixture of car or other accidents, impact traumas, infections or illnesses, strains to the vertebral column... Perhaps some rib work could go on the menu!