

Proper wear of Hard Armor

Purpose

Body armor is meant to keep you in the fight. That is, armor is meant to protect your vital organs which, if hit, would immediately take you down and prevent you from putting rounds on target. The possibility of saving your life is a secondary benefit of body armor.

What to protect

With this purpose in mind we must understand those structures we need to protect which we can realistically protect while still maintaining a high degree of mobility. Our primary concern is the heart and the large blood vessels which sprout from the top of the heart: the superior vena cava, the arch of the aorta and the pulmonary trunk. I will refer to these vessels simple as "related vessels" from here on. A hit to the heart and its immediately related vessels will very quickly take you out of the fight and kill you within a minute or two.

Second in importance to the heart is the respiratory diaphragm, the muscle which, when contracting, allows you to decrease air pressure within your lungs and thus take in air. Destroy the diaphragm and you destroy one's ability to breath.

Protecting the vertebral column goes without saying -we wish to protect as much of this as possible without sacrificing mobility for obvious reasons.

It is important to note that a hit to the lungs may prove to eventually be lethal but is not nearly as lethal as quickly as a hit to the heart and its immediately related blood vessels. The liver and kidneys, while highly vascular, are also not immediately incapacitating.

Front/chest plate

The top of your plate should be at the level of your suprasternal notch aka jugular notch. If you follow your sternum towards your head, the soft spot you reach at the top of it is the suprasternal notch. Your plate should ride at least level with the top of your sternum while standing.

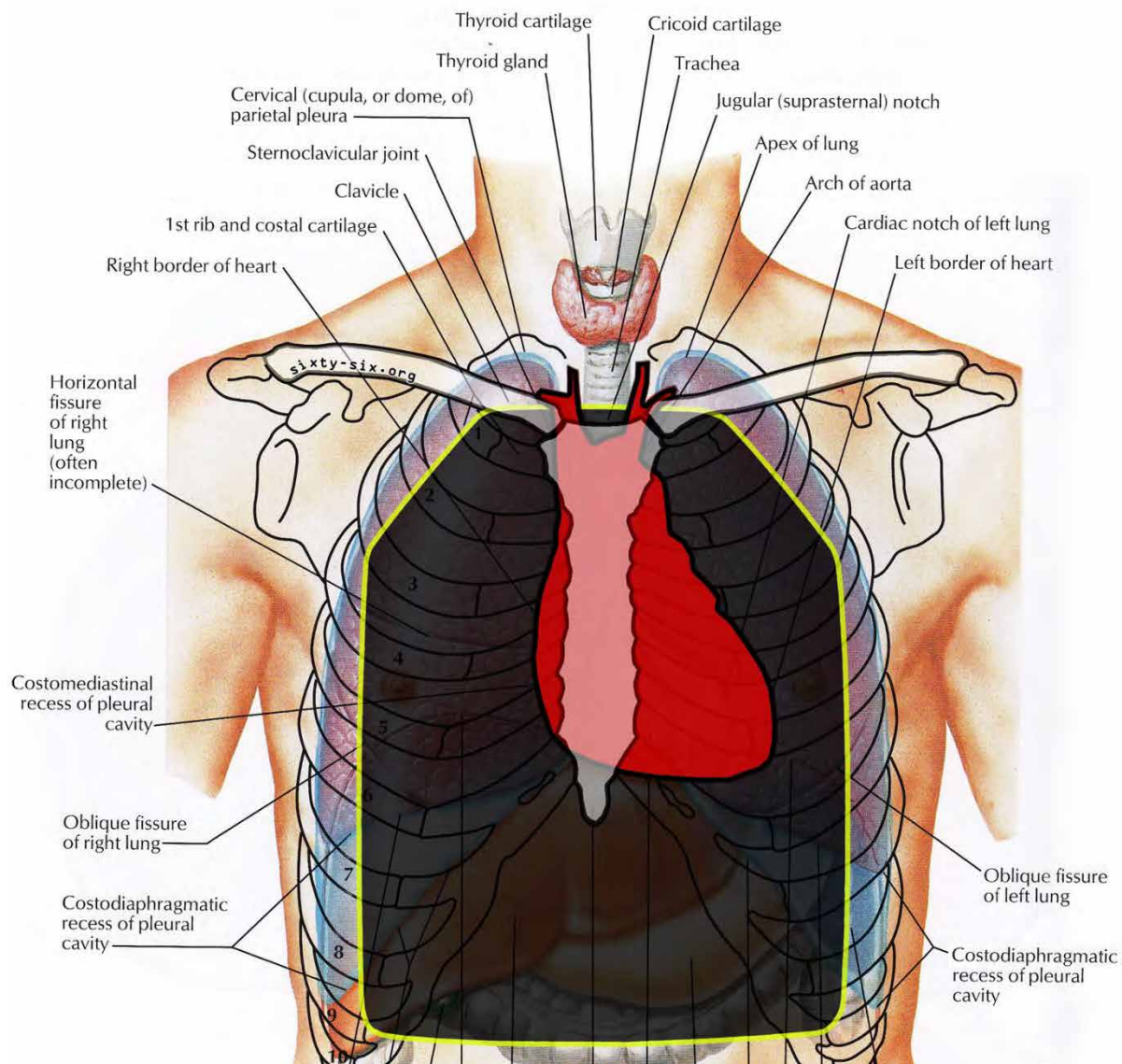
The importance of positioning the plate at the top of the SN Notch is that you have a bundle of large blood vessels which rest on top of your heart and lie behind the manubrium (the uppermost portion of your sternum), most notably the aortic arch. The aortic arch receives blood from your left ventricle and will have the highest velocity of all the blood in you systemic circulatory system. Get hit here and you will be done. So, make sure your plate is riding higher, rather than lower because protecting your aortic arch is much more important than protecting your guts.

Also, as you can clearly see with the image below, a smaller plate allows for more comfort and mobility to the shooter will not necessarily mean you will leave immediately incapacitating areas unprotected -large plates will only cover a little more of your peripheral lung tissue and viscera.

Reference image (anterior view)

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Red is your heart and related blood vessels
 Dark Grey/Yellow is a properly positioned plate
 The sternum and clavicle are white with black outline



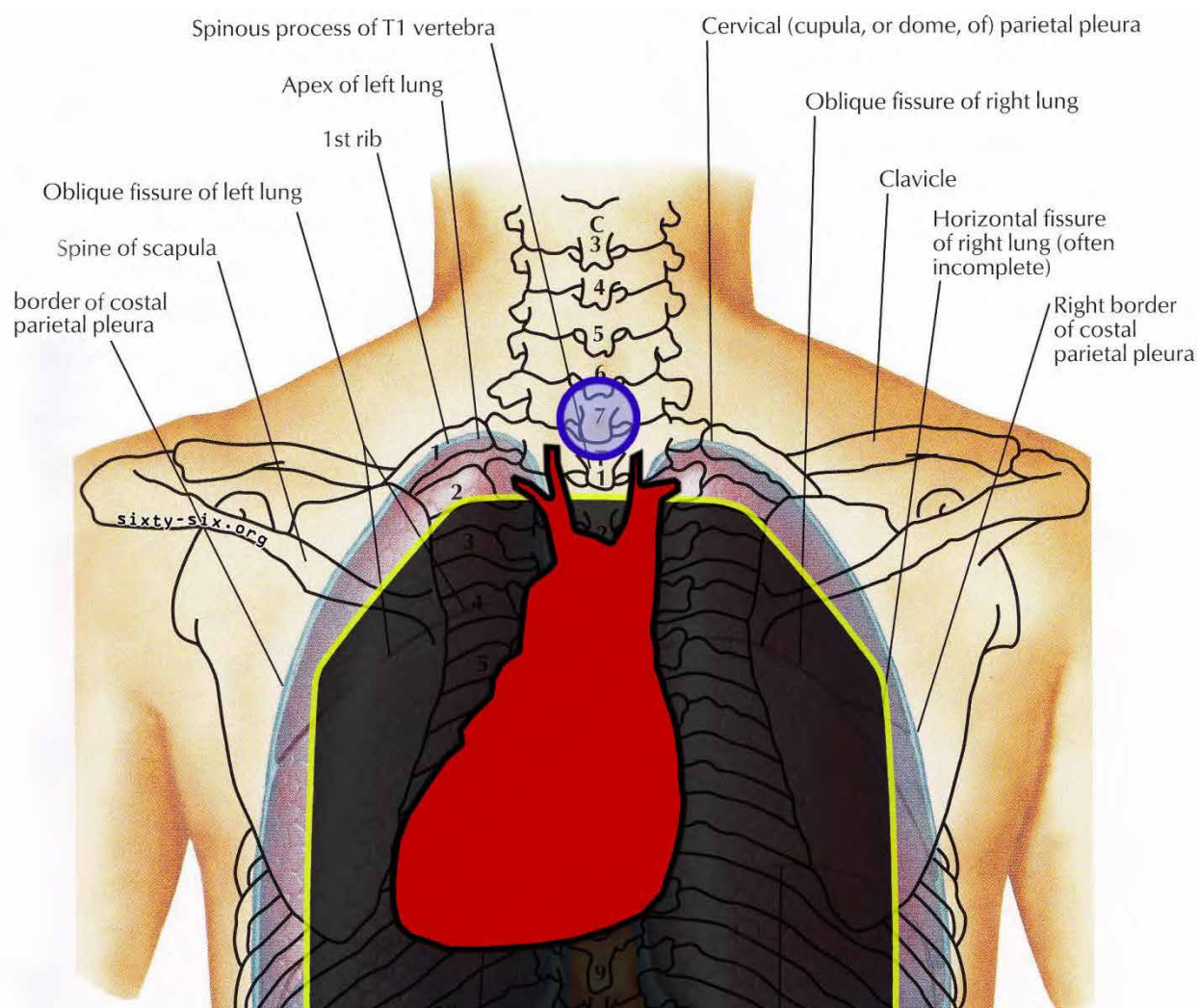
Positioning of rear/back plate

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Find the most prominent bony eminence at the base of your neck. This is your vertebral eminence. Count down two bony spinous (or measure down about an inch) and that should be above the level of the superior aspect of your sternum. Positioning at least this high will ensure your entire heart and its immediately related blood vessels are protected.

Reference image (posterior view)

The vertebral eminence is marked in the diagram below in blue.



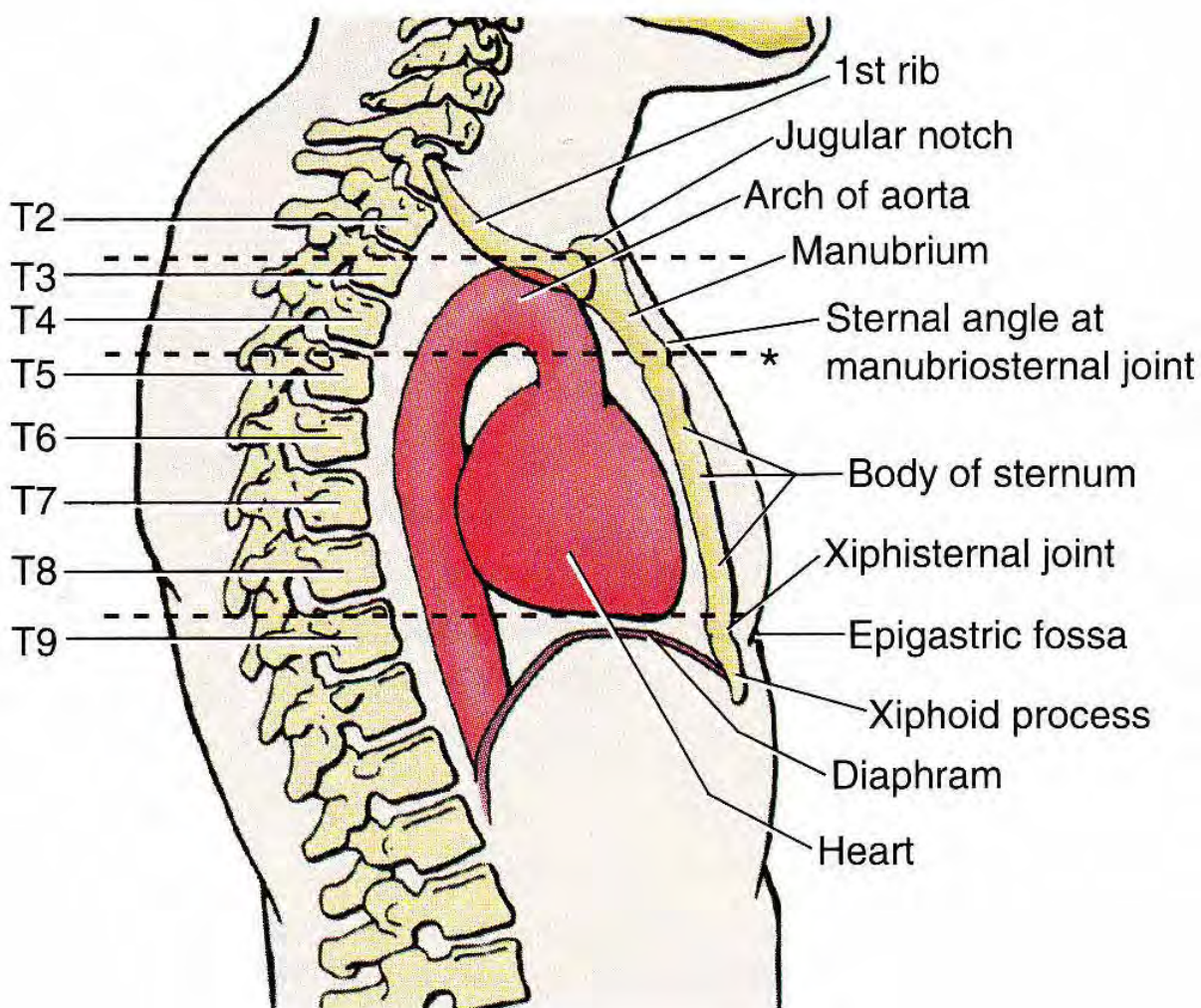
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Side plates and shoulder plates

Side plates are intended to protect the highly vascular elements of your abdomen. They were introduced to prevent troops from bleeding out in the chopper on the way to the field hospital. Side plates were not necessarily intended to protect the heart, but if you wear them high up into your armpits you can protect some of the lower portion of your heart.

Protecting your heart from a shot to side is accomplished by shoulder plates, such as the ones manufactured by Crye Precision.

Reference: lateral view of thorax



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To sum it up

Here are general guidelines to follow at a bare minimum. As always, the more protection you can have without sacrificing mobility the better. This is just the bare bones.

Front plate: should be even with top of the sternum while standing, extend at least 1.5 inches past the bottom of your sternum and should cover the entirety of your nipples

Rear plate: should lie no lower than an inch below your vertebral prominence

Side plates: the higher they ride the better

