

Lethal Triad of Trauma

(0:00 - 0:19)

The triangle that we're looking at is going to represent the lethal trauma triad of death, or you may know it as the trauma triad of death. There's a few different names for it, but essentially they're describing the same thing. And what it's describing are these three symptoms that in combination can lead to the death of a trauma patient.

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And these are really some unseemly symptoms. And we see this in patients that have, as the name suggests, experienced some type of traumatic event. And really it's a traumatic event that's going to lead to a significant blood loss, so something that's causing the patient to haemorrhage.

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Let's write that here, haemorrhage, because that's really going to be our base and our underlying problem here. In the event that a patient is haemorrhaging, we have low volume and we have low perfusion. So we have hypovolemia and hypoperfusion.

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Well, in the event that we have hypovolemia and hypoperfusion, we will end up with hypothermia. Low body temperature, right? If you think about it, it makes sense. We don't have that warm circulating blood going around in our body, so our body temperature is going to drop.

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This is one part of our triad. Now, as a result of hypothermia, decreased body temperature, we can actually end up with coagulopathies. So I'll write coagulopathy, because the coagulation cascade actually requires warm body temperature to function properly.

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So if we don't have a warm body temperature, then it's going to interrupt that coagulation cascade. And the enzymes that are involved are not going to be able to do their thing properly. So now we have low body temperature that's causing coagulopathy, and coagulopathy now is going to cause excessive or prolonged bleeding.

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So we're losing even more blood. Our volume is dropping even more. The perfusion is dropping even more.

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So now we're thinking that we're having a significant decrease in this oxygen-rich blood available to the body. And if our body doesn't have oxygen available to do its thing, right, to carry out its functions, it's going to turn on anaerobic mode, and it's going to start working in the absence of oxygen. Well, when that happens, we create lactic acid, and this will cause acidosis.

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And as we know, acidosis is a decrease or lowered blood pH. And a low blood pH can do damage to our tissues, to our organs, and more specifically, it can really decrease our myocardial function or myocardial performance. And if we have decreased myocardial performance, our heart's not doing its thing like it should be, right? It doesn't have a normal cardiac output, then that can just worsen our hypothermia.

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Because again, we don't have that blood circulating around the body. So as you can see, this kind of works like a positive feedback loop. Each thing feeds off of the other, and it can exacerbate each other as it goes around.

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The underlying cause here, as we pointed out, is the fact that we have this patient who's experiencing a haemorrhage, significant blood loss. The goal is really to fix this problem. So perhaps emergency surgery is in line to figure out where this bleeding is coming from and to stop it.

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Because if we can stop this, then we can correct some of these symptoms and hopefully save the patient's life. In addition to that, you should be thinking about each one of these symptoms, hypothermia, the coagulopathy, and the acidosis, and the things that are appropriate that might be in place to fix those symptoms or to treat those symptoms. So hypothermia, we want to rewarm the body.

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Coagulopathy, we want to be sure that we're giving the body the enzymes that are needed to properly clot. Acidosis, we want to correct that blood pH. So again, the underlying goal for this patient is to correct the problem, the haemorrhage, so that we can interrupt this very fatal cycle.