Snakes

Fortunately for you, the hiker, there are only 3 types of snakes that you need to memorize to stay safe on the trail: the eastern coral snake, the timber rattlesnake, and the copperhead.[1] Unfortunately for you, the hiker, said three types of snakes are highly venomous and can put you out of commission for quite some time (if not forever) if you happen to get bitten. It is important to not panic and attempt to kill any snakes you see, as they are vital parts of the ecosystems and the trail wildlife. Most of the snakes on the trail are not venomous and being bitten will be somewhat painful but not dangerous apart from possible infection. The ones below, however, are the ones that are actually dangerous to hikers on the AT.

Many will be familiar with a common rhyme to keep track of whether a snake is a coral snake or not (there are look-alikes that take advantage of predators' inability to memorize children's rhymes): "Red touch yellow, kill a fellow. Red touch black, friend of Jack." In other words, if the red rings on the snake are surrounded by yellow rings, it is a coral snake that will inject you with nasty neurotoxins that cause fatal respiratory paralysis.[2] If the red rings are surrounded by black rings instead, it is probably a scarlet kingsnake that is a shameless animal con-artist (it is not venomous in the slightest).[3] Coral snakes have fixed fangs in their upper jaw (unlike the pit vipers described below), which means that when they bite you, they don't usually let go, they just chill there filling you up with aforementioned nasty neurotoxins.[2] If you have a lapse of memory and can't remember the stripe order, you can also remember that the true coral snake will always have a black snout, while the scarlet kingsnake has a red snout.[4]

Coral snakes typically only go as far north as North Carolina, but the other snakes make the Northern parts of the AT equally dangerous.

Pop Quiz:
Which one is venomous, and which one is the imposter?

There is no rhyme to identify the timber rattlesnake; fortunately, they are usually kind enough to provide an audible warning to you before they take a chunk out of your leg. If you hear, well, a rattling noise, remain absolutely still until you identify the location of the snake, and then back away **SLOWLY** from the snake's position; fast or uncontrolled motion will cause the snake to strike.[5] As touched on above, rattlesnakes are part of a classification of snake called pit vipers. The good thing about this classification is that they do not have fixed fangs (they can fold their fangs back against their jaw), so they won't just chill out with their fangs embedded in your flesh. The bad thing about this classification is that these snakes have a heat-sensitive sensory organ on each side of the head (the "pit" from where they derive their name) that enables them to locate warm-blooded prey and strike accurately, even in the dark.[6] This classification also means that timber rattlers have the distinctive triangular head shape that indicates that they are vipers. If you happen to have a very good memory: timber rattlers are tan or light brown with dark stripes, and an orange or brown stripe running from head to tail across the top of their back.[6] While it is possible to get away with knowing nothing more than that rattlesnakes rattle, this is not always the best choice of identifier for several reasons. Firstly, rattlesnakes are not compelled by some mystical force to rattle before they strike. It is entirely possible that a snake that does not rattle is a rattlesnake.[7] Secondly, the series of rings that rattlesnakes use to produce the rattling noise are not present in younger rattlesnakes. The snake produces one of these rings each time it molts, so young snakes have fewer of them, and babies have only a "button".[8] Thirdly, wet rattlesnakes cannot rattle, since the water interferes with the functioning of the aforementioned rings that rub together to produce the distinctive sound.[9]

Notice the triangular head and rattle (in the middle of the coils). If you are close enough to see these features in a wild rattlesnake, you are too close.

The last type of non-scuttley fanged individual to worry about is the copperhead, who also has a triangular head; copperheads are pit vipers just like rattlesnakes.[10] The copperhead is probably the hardest of the three to identify because it doesn't have distinctive stripes and doesn't have the capacity to rattle at you before striking. Copperheads range from having a copper hue to having an orange-pink hue, and have brownish red crossbands on the midline of their backs.[10] While all three types of snake generally try to avoid human contact, the copperhead is notable for being relatively the worst at doing such. Coral snakes and timber rattlers will generally have no qualms slithering away from humans, but copperheads have a "freeze" reflex that gets them stepped on more frequently than the others.[11] This tendency to freeze is hypothesized to be present because of the extreme effectiveness of their camouflage: when lying on dead leaves or red clay, they can be almost impossible to notice. They will frequently stay still even when approached closely, and will generally strike only if physical contact is made.

Would you see it if you didn't know it was a picture of a snake?

While it is inevitable that you will come across several slithering somethings if you complete a full thru-hike, there are certain steps that can be taken to both minimize likelihood of encounters and minimize the risk that said encounters entail. Snakes are cold blooded and will therefore be active mostly in warmer climes. While it would be intuitive if all snakes hunted during the day, pit vipers defy logic by hunting primarily at night; [9] this is because their prey (mainly rodents) is nocturnal instead of diurnal. It is wise then, if you are in warmer weather, to wear shoes and carry a flashlight whenever you walk anywhere at night. This general principle does not mean that these types of snakes aren't out during the day, they just are not active. Often snakes will find a nice sunny rock or log to sit on, with crevasses nearby that they can move into if they get too hot (or if they want to hide). This is why it is not

uncommon for hikers to be bitten when traversing anything that requires handholds or footholds; stick your foot in a snake's face, and you're going to get bitten. A good thing to draw from this is to check any places that you can't see into directly with your walking stick/hiking pole to make sure nothing is hiding.

If you have a close encounter of the snake kind, there are several things to keep in mind. First off, don't assume an apparent lack of interest indicates the snake is sleeping, ignoring you, blind and deaf, or too full to move. While a snake may strike across a greater distance if coiled, snakes can attack from any posture (including a seemingly asleep one). Most snakes can strike a distance of roughly two-thirds their body length.[7] This means if you encounter a six-foot snake, it can easily attack any object within a four-foot radius, with zero warning (most snakes strike faster than our eyes can track). Secondly, as was briefly mentioned in the paragraph for timber rattlers, you do not want to move rapidly around snakes. This is because they interpret your rapid motion as threatening and are much more likely to strike than if you move in a calm, controlled manner. Thirdly, if you have anything to keep in between you and the snake (hiking pole, hiking partner), do so. If the snake does strike, there is a possibility it will strike at your front-guard rather than you. Fourthly, do not attempt to poke or prod the snake with a stick or other object in an attempt to get it to move out of your way. This will only annoy the snake and make it more likely to strike. The best solution is to wait until it clears the trail (and then some more so that it doesn't ambush you from the bush that it slithered into).

If you follow the simple guidelines above, your encounters with snakes should be learning experiences and moments to appreciate the beauty of their lethality outside of experiencing it. This section may have been a bit skewed because I am fascinated by snakes, but hopefully you still learned something that you thought was helpful and not frightening. One last fun fact about snakes to make sure you did in fact learn something frightening: if you come across what appears to be snake roadkill, keep your distance. Dead snakes can retain some neurological reflexes, and have been known to bite! [12]

References:

1. Mauldin, David. "Appalachian Trail Wildlife." Appalachian Trail Wildlife. N.p., n.d. Web. 21 Oct. 2014. <http://www.trailquest.net/ATWILDLIFE.html>.

2. "Eastern Coral Snake Micrurus Fulvius." ENature: FieldGuides: Species Detail. ENature, n.d. Web. 21 Oct. 2014. <http://www.enature.com/fieldguides/detail.asp?recnum=AR0122>.

3. "Scarlet Kingsnake / Eastern Milksnake (Lampropeltis Triangulum)." Species Profile: Scarlet Kingsnake / Eastern Milksnake (Lampropeltis Triangulatum). Savannah River Ecology Laboratory, n.d. Web. 21 Oct. 2014. <http://srelherp.uga.edu/snakes/lamtri.htm>.

4. "How to Tell the Difference Between a King Snake and a Coral Snake."WikiHow. WikiHow, n.d. Web. 21 Oct. 2014. <http://www.wikihow.com/Tell-the-Difference-Between-a-King-Snake-and-a-Coral-Snake>.

5. "What to Do If You Encounter a Snake in the Bush." What To Do If You Encounter A Snake In The Bush. Siyabona Africa, n.d. Web. 21 Oct. 2014. <http://www.nature-reserve.co.za/snake-encounter-tips.html>.

6. "Timber Rattlesnake Crotalus Horridus." ENature: FieldGuides: Species Detail. ENature, n.d. Web. 21 Oct. 2014. <http://www.enature.com/fieldguides/detail.asp?recnum=AR0127>.

7. Klinger, Christie. "Rattlesnakes FAQ." Rattlesnakes FAQ. N.p., n.d. Web. 21 Oct. 2014. <http://www.alongtheway.org/rattlesnakes/faq.html>.

8. Deziel, Chris. "How to Identify Baby Rattlesnakes." EHow. Demand Media, 14 Apr. 2011. Web. 21 Oct. 2014. <http://www.ehow.com/how_8229317_identify-baby-rattlesnakes.html>.

9. "How to Avoid a Rattlesnake Attack." WikiHow. WikiHow, n.d. Web. 21 Oct. 2014. <http://www.wikihow.com/Avoid-a-Rattlesnake-Attack>.

10. "Copperhead Agkistrodon Contortrix." ENature: FieldGuides: Species Detail. ENature, n.d. Web. 21 Oct. 2014. <http://www.enature.com/fieldguides/detail.asp?recnum=AR0123>.

11. "VENOMOUS SNAKES." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, 24 Feb. 2012. Web. 21 Oct. 2014. <http://www.cdc.gov/niosh/topics/snakes/>.

12. "Snakes and Snake Bites." Survive Outdoors. Survive Outdoors, n.d. Web. 21 Oct. 2014. < http://www.surviveoutdoors.com/bites-stings/91/ >.

Picture credit:

Coral Snake and Scarlet Kingsnake. Digital image. *Relivearth.com*. RelivEarth, 29 May 2012. Web. 21 Oct. 2014.

Hocking, Daniel. *Copperhead (Agkistrodon Contortrix)*. Digital image. *Hockingphotography.smugmug.com*. Smugmug.com, 1 May 2006. Web. 21 Oct. 2014.

Timber Rattlesnake. Digital image. *Esf.edu*. State University of New York College of Environmental Science and Forestry, 14 Aug. 2003. Web. 21 Oct. 2014.

Non-Tick Arachnids

While there are several venomous scorpion species present on the trail (the Vaejovids), none are covered explicitly because, though their stings may be painful, they have no lasting effect. To minimize scorpion risk, just shake out boots in the morning before putting them on, since scorpions like to take cover in them for warmth overnight.[1] You really shouldn't have to worry about scorpions too much on the AT as long as you pay attention; scorpions are far more common in the desert regions of the Southwest United States (such as Arizona).

Spiders give you potentially more justification for worrying. Brown recluses can cause lasting tissue necrosis and black widows can cause neurotoxic respiratory paralysis similar to that of the coral snake.[2] Most spiders are absolutely harmless to humans; in fact, of the over 20,000 different species of spiders that inhabit the Americas, only 60 are capable of biting humans. Within that small group, only four are known to be dangerous to humans: the brown recluse, the black widow, the hobo or aggressive house spider, and the yellow sac spider. Within this even smaller group, only the brown recluse and the black widow have ever been associated with significant disease and rare reports of death.[3] Unfortunately for hikers, the AT (debatably) has both species, in rather more abundance than the snakes already talked about (statistically, there are many many more spiders than snakes). Other than their higher numbers,

spiders are arguably more dangerous than snakes because their small size makes them much less noticeable than the snakes (meaning you are more likely to absent mindedly walk into a spider than a rattlesnake). Black widows are unquestionably present on the trail, but some refuse to believe that brown recluses are a threat. While non-endemic speciation is discussed more thoroughly on the tick page, there is enough debate out there that I would know how to identify a brown recluse even if certain groups do not wish to believe that they have jumped habitats. Brown recluses are at least present for the very first leg of the trail in North Georgia, for NOBOs that is.[4]

People familiar with the black widow will know that the gender you have to worry about is the females (they are the large and venomous part of the union). While it is actually rare for female black widows to cannibalize the males in the wild,[5] in the case of controlled laboratory experiments where you lock the male in a cage with the female 30 times his size…. it's not so hard to see how they got their name. Adult female black widows are identifiable by the distinctive red hourglass on their abdomen, and through several other physical characteristics (outlined in source 6 and summarized here). They are generally shiny black in appearance (but may be dark brown), and have a plump abdomen attached directly to the thorax behind the legs. Their webs are amorphous with thicker threads than normal spider silk, are usually about 30 centimeters in diameter, and generally have one or two white or light brown egg sacs. Generally, you will know immediately if you have been bitten by a black widow because it is very painful, and other symptoms such as numbness, tingling, rashes, sweating, nausea, vomiting, dizziness, cramps, rigid abdominal muscles, chest tightness, and weakness will manifest themselves.[2] Some people have worse reactions than others to the venom, but black widow bites are not usually fatal for a grown human with an uncompromised immune system.

Brown recluse spiders, just like black widows, are identified almost exclusively by physical characteristics. The most sure way to identify a brown recluse spider is by its coloring: if the spider has stripes or other pigments on its legs, it's not a brown recluse; if the spider has more than two pigments on its body, it's not a brown recluse; if the spider has legs that are darker than its body, it's not a brown recluse.[7] Brown recluses can also be identified by a violin-like pattern on their back (though many other species of spider share a similar pattern) or by their web structure, which is amorphous just like that of the black widow. Finally, if you have no fear of getting up close and personal, brown recluses are almost

unique among spiders because they only have six eyes instead of the standard eight.[7] It is more common for brown recluse bites to be noticed after the fact since their bites don't possess the same stabbing pain as do the black widow's. Whereas the black widow's neurotoxins cause mainly visceral responses, the brown recluse's cytotoxins express themselves dermatologically. Brown recluse bites cause local swelling, pain, itching, redness, tenderness, and blisters. They eventually form large ulcers and may cause tissue necrosis- death of the tissue in the area of the bite.[2] Fever, chills, and nausea may also occur as time passes and the venom spreads.

References:

1. Plotkin, Stuart. Google Books. N.p.: Menasha Ridge, 2013. Google Books. Menasha Ridge Press. Web. 21 Oct. 2014.

2. Balentine, Jerry R., Dr. "Black Widow and Brown Recluse Spider Bite Causes, Symptoms, Treatment - Spider Bite Symptoms - EMedicineHealth."EMedicineHealth. EMedicineHealth, n.d. Web. 21 Oct. 2014.
<http://www.emedicinehealth.com/wilderness_black_widow_and_recluse_spider_bite/page2_em.htm>

3. Balentine, Jerry R., Dr. "Brown Recluse Spider Bite: Click for Pictures and Symptoms." EMedicineHealth. EMedicineHealth, n.d. Web. 21 Oct. 2014. <http://www.emedicinehealth.com/spider_bite_brown_recluse_spider_bite/article_em.htm>

4. Wirth, Chris. "Range of the Brown Recluse - Loxosceles Reclusa - BugGuide.Net." Range of the Brown Recluse - Loxosceles Reclusa - BugGuide.Net. Bug Guide, n.d. Web. 21 Oct. 2014. <http://bugguide.net/node/view/33494>.

5. Crawford, Rod. "The Spider Myths Site." Spider Myths: Mate and Be Eaten! Burke Museum, n.d. Web. 21 Oct. 2014. <http://www.burkemuseum.org/spidermyth/myths/blackwidow.html>.

6. "How to Identify a Black Widow Spider." WikiHow. WikiHow, n.d. Web. 21 Oct. 2014. <http://www.wikihow.com/Identify-a-Black-Widow-Spider>.

7. "How to Identify a Brown Recluse." WikiHow. WikiHow, n.d. Web. 21 Oct. 2014. <http://www.wikihow.com/Identify-a-Brown-Recluse>.

Picture credit:

Black Widow. Digital image. *Hsc.unt.edu*. University of North Texas, 1 Oct. 2013. Web. 21 Oct. 2014.

Brown Recluse. Digital image. *Hsc.unt.edu*. University of North Texas, 1 Oct. 2013. Web. 21 Oct. 2014.

Bite Procedure

This is separate from the individual sections on spiders and snakes because the first few steps are identical regardless of the type of bite. The first thing that should be done is to move away from whatever it was that bit you, assuming you notice the bite immediately; for venomous snake bites and for black widow bites this will usually be the case, while for brown recluse bites, you may not notice the bite until symptoms set in. The next step is to contact health professionals or emergency services, if at all possible. It is mandatory that you get immediate help for the venomous snake bites,[1] but you may choose not to pursue this course for spider bites if you find that your symptoms are neither severe nor persistent (it is not a bad thing to be overly cautious however). If you have no means of communication, but are hiking with a partner, send your partner ahead to request aid and stay where you are. If you have neither means

of communications nor a hiking partner, slowly make your way to a place where you can request aid yourself (the "slowly" part will be discussed further below). After calling for help, wash the wound (spider or snake) with soap and water.[2, 3] If you make it through the neurotoxic paralysis or cytotoxic necrosis, there is a distinct possibility of simple bacterial infection, which, if you think about it, is a really crappy way to go if you survive the initial envenomation. Washing the wound will minimize this risk, as will putting on disinfectants (such as Neosporin), or using hydrogen peroxide to clean the wound. Jewelry or other constricting items should be removed from the bite area so that if swelling occurs they will not get in the way later.[2, 3] After this point, procedures begin to differ.

Snake Bites

For venomous snake bites, your life may be a race against the clock depending on how "wet" a bite you received; the venom injected in snake bites can vary greatly, from none (a "dry bite"), to hundreds of milligrams, enough to kill any normal sized human being.[4] Even though washing the wound is good standard practice (which is why it included above, and in almost all written guides on the topic), it can make the type of snake harder to identify for medical professionals who make their selection of antivenin based off of bite patterns and toxins at the site. This is really not that big a deal nowadays since coral snake antivenin was discontinued in the United States in 2011; [5] the only type of antivenin now used is for rattlesnake bites, which can also be generalized for copperhead bites. Because identifying the type of snake is not as important as it used to be when multiple types of antivenin were offered, and because much of hospitalization for venomous snake bites no longer strictly revolves around antivenin, it is a much better idea to wash the wound to minimize risk of infection rather than wash around the wound to maximize bite identifiability (I have mentioned this here in case multiple types of antivenin are introduced in the future).

An important note after you have called for assistance is to stay calm; there is really very little you can do to help yourself.[2] Panicked thought will increase heart rate and only make the venom spread through your system more quickly. Similarly, hasty movement will also increase heart rate, and will likely be less beneficial than taking a more measured pace if you must move at all (if you are alone and

must get to a position to contact someone). The best you can do is sit down, stay still, and conserve as much energy as possible. **DO NOT** elevate the bite above the level of your heart, because doing such will significantly increase the rate at which the venom spreads throughout your bloodstream (causing a faster onset of symptoms/death). If it is a shallow bite, let the wound bleed out naturally. Because of anticoagulants in the venom, it will bleed extensively for the first few minutes and will taper off as time passes (and your body's platelets begin to become effective). If the bite is deep enough to cause spurting (the strike hit an artery and you are losing blood fast), **DO NOT USE A TOURNIQUET AND DO NOT ICE THE WOUND**.[1] Restricting blood flow is a very bad idea for rattlesnake and copperhead bites because their venom contains hemotoxic compounds that destroy red blood cells; by limiting blood to a certain area, you are effectively guaranteeing necrosis of that area and amputation will be necessary. Instead, if blood loss is significant, apply **SLIGHT** pressure (in the form of a constriction band if you have one) that will reduce blood flow somewhat but not excessively hamper its progress- a good rule of thumb is if you can fit a finger under the wrap without undue effort.[6] The general goals when dealing with a bite that is causing you to lose a lot of blood is to minimize blood loss while allowing adequate enough blood flow to the area such that necrosis does not occur. Do not take stimulants (which elevate heart rate) if you suspect a venomous bite; tobacco and coffee will both increase the rate at which the venom spreads.

Spider Bites

If you have a spider bite on an extremity, elevating that extremity will help reduce swelling, though it will make the venom spread through your body faster too (this is not as big a deal for spider bites since black widow and brown recluse venom is not as debilitating as that of the snakes).[3] You may also place more constriction on spider bites to help slow the spread of the venom, though extreme amounts of pressure should still be avoided (recluse venom is not as potent as rattlesnake/copperhead venom, but it can still cause tissue necrosis). Cold presses may also be useful to help slow the spread of the venom and to reduce swelling (though again, use caution as reduced blood flow does make necrosis more likely).[3] In general, you should not be as worried about spider bites as snake bites because they are

not fatal unless certain conditions are met (very old or very young, low immune functioning, allergies to the venom, etc.). Keep a close eye on the bite, and if symptoms persist or suddenly worsen, you should contact medical services (if you didn't at the outset). Antivenin exists for black widow bites if you have an extremely adverse reaction, but it is not as commonly used since the risk of allergic reaction to the antivenin itself often outstrips the benefit from nullifying the symptoms (which will be quite debilitating for a time, but tend to go away fairly quickly). Fast movement should still be avoided (there is no need to unnecessarily increase the rate of the venom's spread), and it is preferable if you remain relatively immobile until you recover. Tobacco and coffee should still be avoided.

Things Not To Do:

1) Do not make incisions to attempt and "draw the venom out" (you will cause more blood loss and accomplish nothing).

2) Do not attempt to "suck the venom out" of the bite with your mouth (it does nothing but waste time, and for rattlesnake bites, if you have any sores or openings in your mouth, it can lead to immediate loss of unconsciousness or even death).[2]

3) Do not attempt to chase after and kill whatever critter bit you to aid in identification (your exertion is far more costly than whatever benefit you could possibly provide).

References:

1. "How to Treat a Snake Bite." WikiHow. WikiHow, n.d. Web. 21 Oct. 2014. <http://www.wikihow.com/Treat-a-Snake-Bite>.

2. "Snakes and Snake Bites." Snakes and Snake Bites. Survive Outdoors, n.d. Web. 21 Oct. 2014. <http://www.surviveoutdoors.com/bites-stings/91/>.

3. Parada, Jorge, Dr. "Spider Bites." : Symptoms, Signs & Spider Bite Treatment. Pest World, n.d. Web. 21 Oct. 2014. <http://www.pestworld.org/news-and-views/pest-health-hub/posts/spider-bites/>.

4. "What Is a Dry Snake Bite?" Snakes and Spiders. Snakes and Spiders, n.d. Web. 21 Oct. 2014. < http://www.snakesandspiders.com/dry-snake-bite/ >.

5. Murphy, John. "Serpent Research: USA Coral Snake Antivenom Update."Serpent Research: USA Coral Snake Antivenom Update. Serpent Research, n.d. Web. 21 Oct. 2014. <http://squamates.blogspot.com/2010/11/usa-coral-snake-antivenom-update.html>.

6. Mac, Emmalise. "How to Survive a Rattlesnake Attack." EHow. Demand Media, 02 June 2010. Web. 21 Oct. 2014. <http://www.ehow.com/how_6581976_survive-rattlesnake-attack.html>.