KEN HUB

Learn How To Learn

Ultimate Anatomy Study Guide

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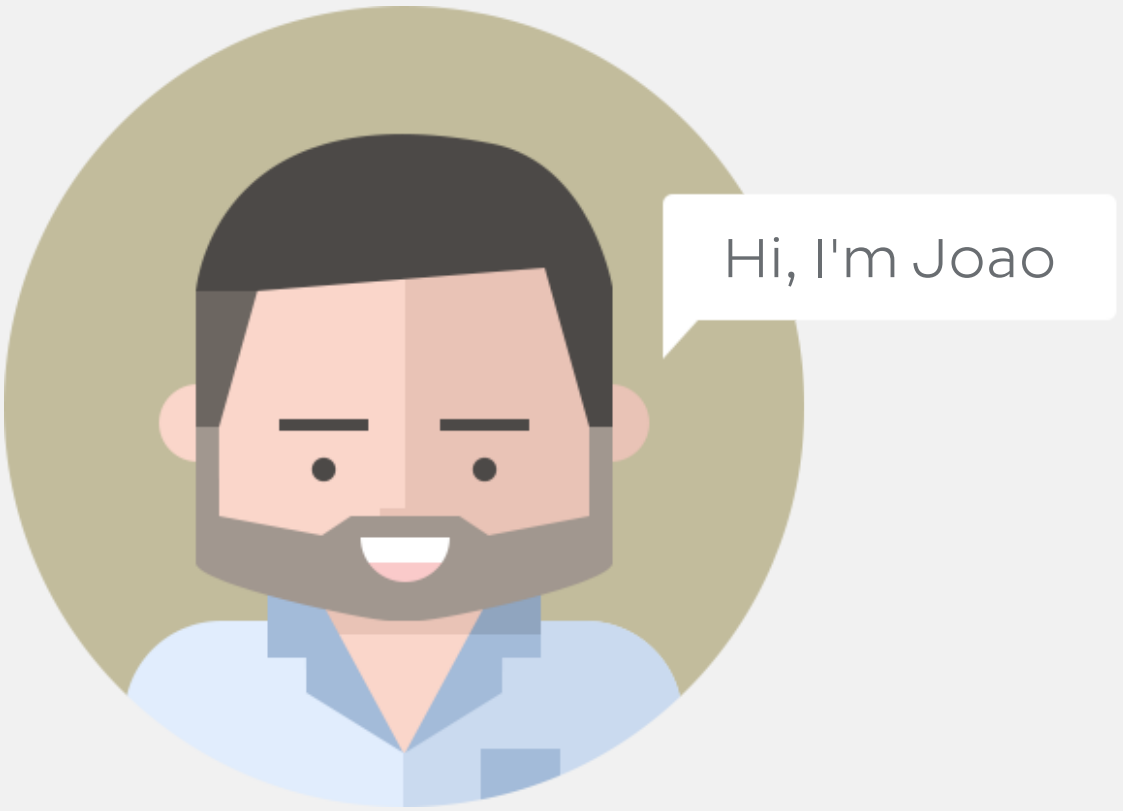
Introduction



If you are like 99% of students, you are probably learning by rote. In other words, you become a robot - mechanically repeating the information that needs to be learned. Studying this way is extremely easy, especially with a subject like anatomy, which has rote learning written all over it. More than likely, understanding the subject is quite easy for you. And that's great! But the question is, how long will you retain the information you have learned using this technique? **Do you feel that after two or three days you forget all the important stuff? Well, join the club**; we have been there (and some of us still are) and we understand the feeling.

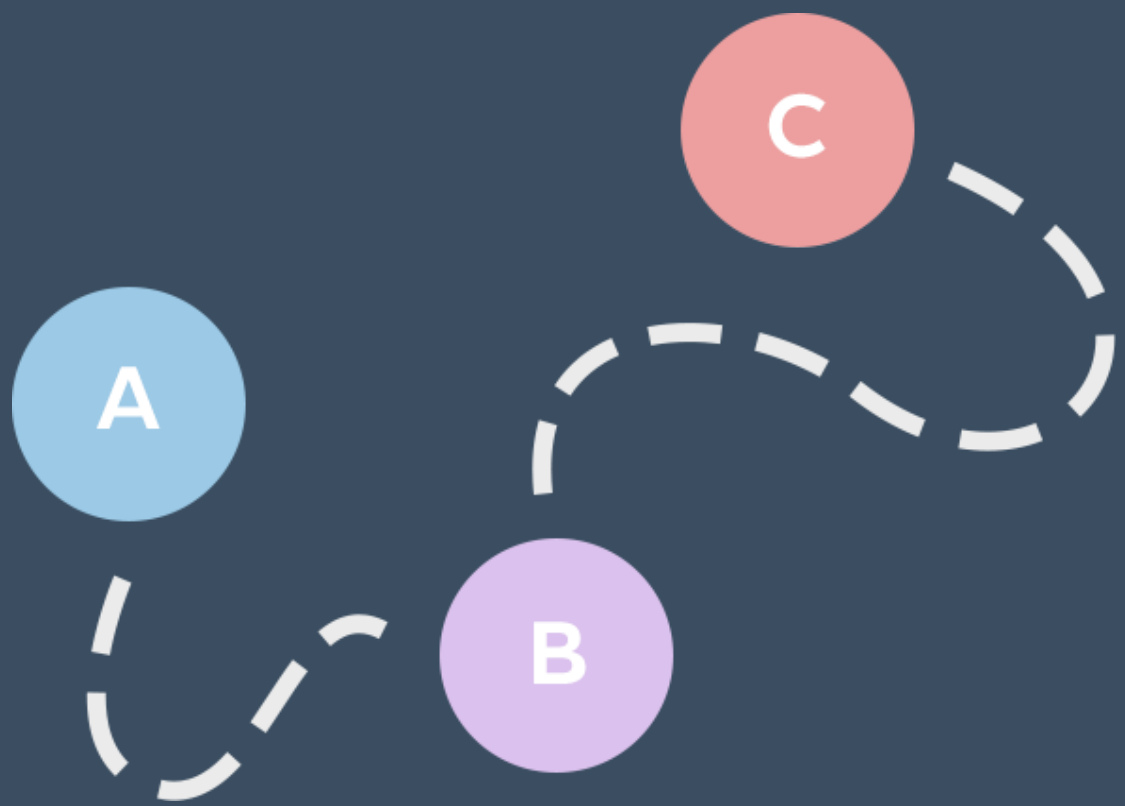
Do you feel that after two or three days you forget all the important stuff? Well... join the club.

Most of the students we know follow a rather straightforward method of learning: they open their anatomy book, start reading the page, take some notes, revise a bit and hope for the best. Do you follow a similar approach? It is definitely not the *worst* strategy, but you'll shed a lot of blood, sweat, and tears...

The good news is that there are a lot of alternatives to this strategy and we are here to show you some of them. But we'll be honest from the very beginning; there are no magic tricks that will enable you to learn everything automatically. There is no "one simple rule" to remember everything. Whoever told you that has never studied anatomy!

On the other hand, there are some steps that you can follow and we do believe that they will make your life a lot easier. We have followed these steps and succeeded. We have also shared these steps with thousands of students worldwide and many of them have also aced their exams. Therefore, we want to share these steps with YOU. To help you overcome the feeling of being a bit lost and start remembering all of the important stuff.

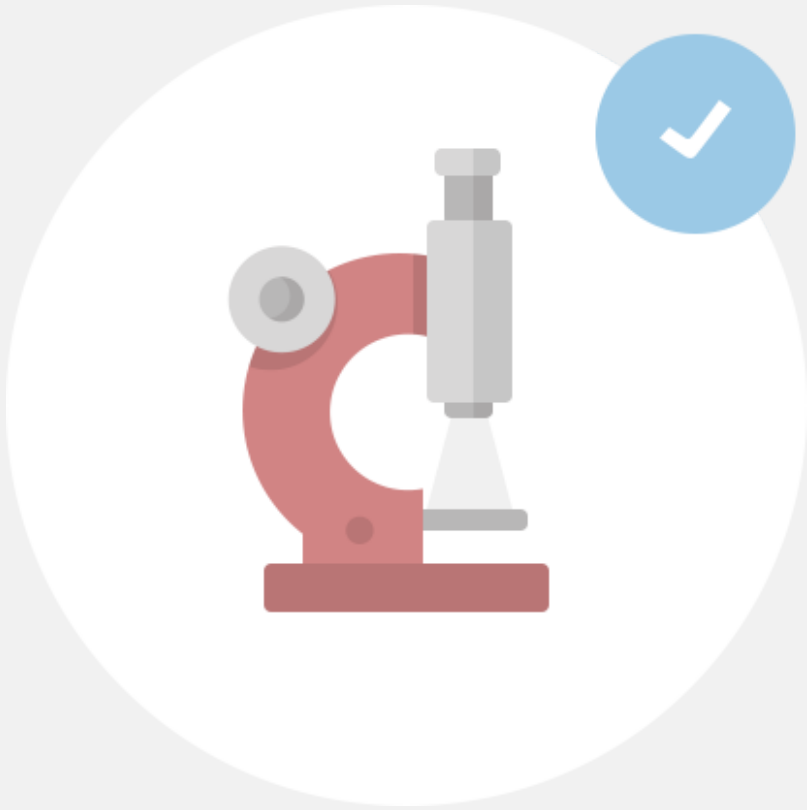
How to use this guide



This guide is written in an easy to read format. We don't like having to read long blocks of text in order to take out the interesting bits - it should be the other way around. Easily applicable steps with practical advice and as little fluff as possible.

The most practical way to read the whole guide is from cover to cover. When you are finished, you will have a complete plan on how to start studying from day one.

What will you find in this book?



In the following pages, you will find:

- **Some real-world, practical steps** that can help you learn in an easy, fun and efficient way
- **Tips, tricks and mind hacks** to improve your memory
- **Learning strategies** that we have used to succeed in our exams
- **Some cool ways** that you can use Kenhub while you are preparing for your next exam.

Step 1:
Stop procrastinating

Do you study for your anatomy exams when it’s time, or do you put it off for as long as possible? If it’s the latter, you are a victim of procrastination. Not to worry, though. It’s something we all do, and there’s a way to handle it.

Why do we procrastinate?

Research has been going on for years to understand why people procrastinate, and the reasons are still not fully known.

The latest work has shown that time-management has nothing to do with this phenomenon, so telling a procrastinator to “stop wasting time and simply do it”, is like urging a depressed individual to “stop worrying and cheer up.”

Why is this the case? **The root cause of procrastination is a failure to properly regulate emotions at a point in time.** When you face a significant task as a procrastinator, it goes like this:

- you **realise** that delaying it is harmful
- you **focus** on making yourself feel better in the present moment (your Kryptonite)
- this desire takes over completely
- you **postpone** the task
- you **hope for the best** in the future (which is a gamble)

Dr. Timothy A. Pychyl at Carleton University says it is a coping mechanism and we *“give in to feel good”*. This is because of the dread that may come with studying anatomy (or any other subject). If you don’t grasp the material, you may want to avoid it like the plague – and that’s understandable. But, you can’t keep doing other things to make you feel better forever.

If you were to do that, you would never get around to studying or achieving the grades you're capable of.

Fortunately, there are many ways to deal with procrastination (although we may not always like to hear it!). Here are some ideas:

- **Divide your work:** The main problem of procrastination is feeling good in the present moment. Therefore, why not fight fire with fire and provide yourself with exactly that? If you have to complete a certain task but you find yourself losing focus midway through, try dividing it into smaller, more manageable parts. By breaking a task into its component parts, we trick ourselves into thinking we are accomplishing more, and this acts to keep us motivated.

- **Make it positive and rewarding:** Distractions can momentarily improve your mood because they help you to forget the unpleasantness of the task at hand. Suddenly, searching online for the origins and history of your surname or trying to see your car on Google Earth is incredibly appealing. As your growing desire to avoid the task at hand threatens to overcome you, the likelihood of blocking distractions gradually becomes less and less likely.

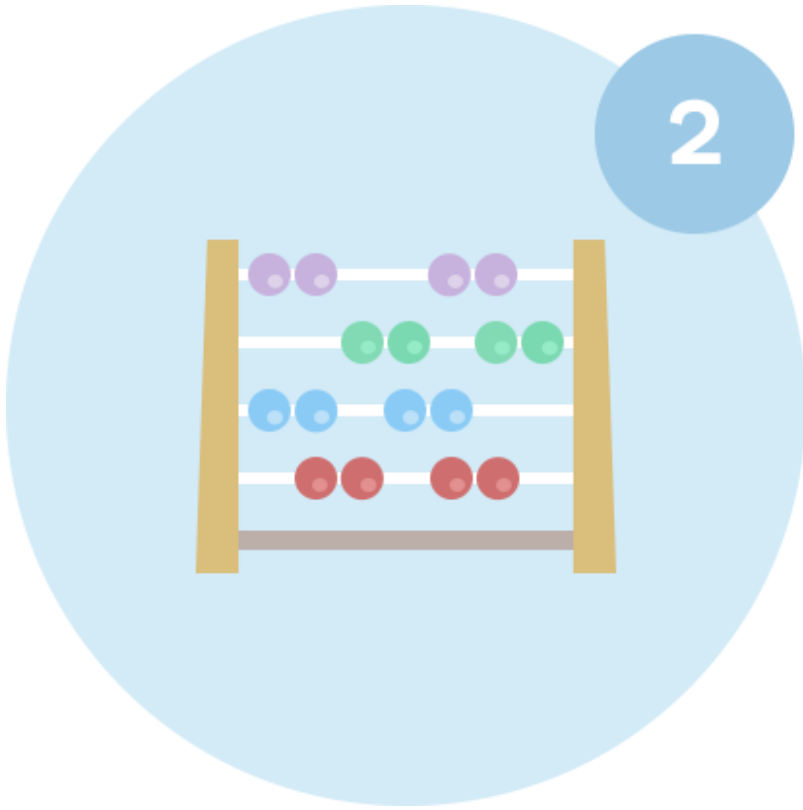
- **Forgive yourself:** As a procrastinator, deep down you know that what you are doing is harmful to your future performance. If this results in you underperforming, you may criticise yourself and the inability to stop procrastinating. But this will only serve to add more negative emotions to your plate, and, as you've seen, a procrastinator does not enjoy negative emotion. A helpful practice is to simply forgive yourself after procrastinating, accept that sometimes things simply go wrong and resolve to do better next time.

In summary: Procrastination is not so much a time management problem, but an emotional problem. And with focus and perseverance, you *can* overcome it!

Ready to start doing something about your procrastination? Don't just *say* you're going to do it... *do it!* :)

Before you start studying, schedule your "me-time" so you have a reward to look forward to.

Step 2:
Study smart (AKA: spaced repetition)



Did you know that there's a technique that can help your brain remember things much better and for longer? It's true that **cramming is just as ineffective as your teachers always said.**

There's a better way to retain what you have learned.

There's a *better* way to retain what you have learned.

Whether you need to learn lists of information, or for instance, every muscle and bone in the human body including how they function together, there is a method that really works to help you out. The bonus? You get to take lots of breaks, so you can stress less! It's called **spaced repetition**, and it's the way to go for knowledge that sticks in your cranium.

> Cramming is just as ineffective as your teachers always said.

By using spaced repetition, you work through a series of increasing intervals of time between the initial learning of a topic and the later testing to see how well you have retained it. This method utilizes the psychological spacing effect, which occurs when you are going back over information that you have already learned in order to remember it better.

Spaced repetition works well for lists of items or new vocabularies such as medical terminology. If you are looking for ways to integrate spaced repetition into your studies, you can:

- **Build flashcards** to help you review information quickly between your breaks
- **Make a schedule** of study time and breaks
- **Place revision topics** that you are confident on a little further down on your schedule. Whenever you go over something, if you know it well, make a note to revise it a little later on. If you don't know it well, or feel like you should revise more, make a note on your study plan to make revising it a priority. It's just that simple!

Another way of studying uses quizzes:

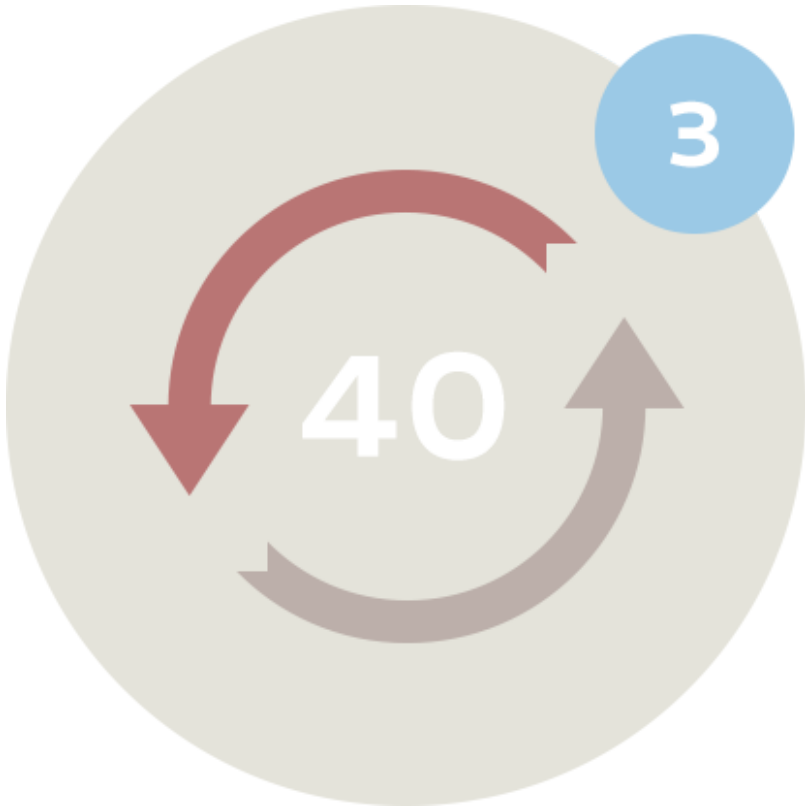
Anki is a great, free tool to help you build your own flashcards. It fits any subject, not just anatomy. However, you'll have to prepare your own flashcards.

If you are looking for something with specific concepts such as anatomy in a quiz format, you'll definitely want to try out the Kenhub quizzes. Unlike Anki, they are all prepared for you.

Spaced repetition is a whole lot like your teachers have advised you to study - review a bit, take a break, repeat. The fact is, that it actually works and it works really well. Repetition is an important part of studying in order to recall information, but the *smartest* form of repetition is by using spaced repetition.

Don’t let your short term memory fool you. Allow at least a few hours, if not days, between your repetitions to really test your knowledge.

Step 3:
Improve your memory in 40 seconds



Remember sitting in an exam and something you clearly knew a moment ago just went “poof”? Improving your memory can be one of the most amazing gifts. Imagine being able to remember more for your next human-anatomy exam. It’s a surefire way to up your grades.

Recent research has shown that memories can be strengthened as a result of consolidation through rehearsal or repetition.

It has found that, within the posterior cingulate cortex, the strength of reinstatement predicted how well things were remembered. So, how do you take advantage of the science for your own benefit?

Remember sitting in an exam and something you clearly knew a moment ago just went “poof”?

In an interview from the BBC with researcher Chris Bird, there is a tip to improve your memory. It goes like this: In your mind, replay what you want to remember, then describe it to yourself for 40 seconds. It sounds too simple, but it works!

Bird asked students to lie in a brain scanner and watch some short clips. Some were given 40 seconds to replay and describe in their mind what they had seen, while others moved on to the next video. Which half do you think had better recall of events? The ones given just 40 seconds improved their recall substantially.

On average, they remembered twice as many details as the control group a week later.

In summary: Describe what you learn. Take 40 seconds to just repeat it to yourself. This has the potential to help you remember the facts a week from now!

Here are a few other tips that can help you to improve a memory:

- **Compare it** to other characters or events. Learning how it differs from something else familiar to you may improve your chances of remembering it.
- **Pick out** most vivid details
- **Rehearse** a sequence of events in your mind

Knowing the flexors of the forearm, branches of the brachial artery or any other fact is not something you can master overnight. Using these tips can help you remember what you read in your textbooks or learn during lectures.

Short term memories do not automatically transition into long term memories. In order to consolidate information long term, we must rehearse it over and over again.

Take a few extra seconds to commit these things to memory and this can really help you to recall them later on.

Go ahead and give it a try!

Step 4:
Read effectively

Although the vast majority of students understand the connection between acquiring knowledge, reading, and intelligence, very few know how to read effectively. Reading should be much more than a one sided conversation where the book teaches you, or even worse, simply gives you information. It should be an organic and engaging exchange of replies. It should be a conversation.

But what *is* effective reading in practice? For anatomy and academic materials, such reading is reflected by selectivity, questioning, surveying, focus, and efficiency. By practicing it, reading will become much more than a familiarisation step because you will absorb and retain the information at a deeper level.

Learning is not merely about understanding. Consolidating the information is a crucial step in forming long term memories.

A powerful and useful reading strategy that incorporates many of those aspects is the SQ3R method.

This is how you can use it:

Step 1: Survey - This involves previewing or skimming your desired chapter in your anatomy textbook. Look for anything eye-catching, like headings, sub-headings, diagrams, tables, summaries and so on. Identify the overall organisation of the topic and then begin to read 'in layers'. How do you do this? As the name implies, you read certain types or 'layers' of information. Specifically, you read the first sentence of each paragraph and read any sentences containing at least one bold word. Just remember that this is intended as a PRE-view - so don't spend a long time doing this.

Step 2: Question - This step allows you to get your foot in the door and really start to read effectively. As you preview, ask yourself as many questions as possible. Try and transform each heading into a question, formulate questions you expect the text to answer, create future exam questions, etc. Essentially, be a curious five year old child who is constantly looking for answers.

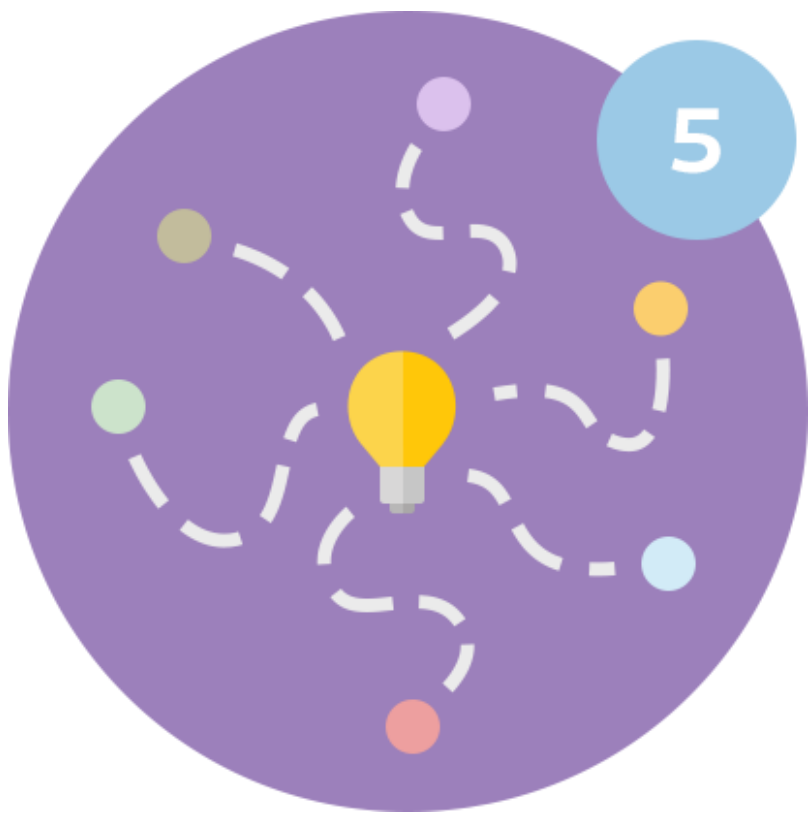
Step 3: Read - You familiarised yourself with the content and now it is time to tackle it. However, don't simply plough through it until the end! Divide it into manageable chunks of approximately one to two pages. Try and answer your previous questions and deeply process what you are reading. Try and fit it into your existing web of knowledge. Make an outline or take notes. You can also highlight, as long as you do it properly. To mark correctly, avoid highlighting entire sentences, chain words together to form new 'sentences' and put down the highlighter when you preview.

Step 4: Recite - This involves *recalling* what you have just read. Close the book and start *explaining* what you have just read in the previous two pages (this is actually active recall, an essential principle for any learner!). The easiest way to do this step is using the *"2, 1, 0 method"* (there are a lot more here!). After you finish your explanation, quickly glance at your anatomy book and score yourself - a "2" if you remembered *most* of the information, "1" if it was about fifty-fifty and "0" if your attempt was straight up terrible. This method is basically a quick yet effective test. Remember to *connect* the ideas, *simplify* the concepts and *use your own words* rather than pure recitation.

Step 5: Review - This step is more of a constant and ongoing process that you need to undertake, especially for a fact-filled subject like anatomy. Revise the notes that you took and try to answer the questions that you formulated at the beginning. In terms of a long-term plan, good methods to revise would include Kenhub's learning strategies and quizzes. Specifically designed to learn and test all your anatomy knowledge, your learning will certainly skyrocket from using them. Do you want to see the most common learning mistakes to avoid when studying this subject, or revise the heart using active recall? Go and have a look, they're all waiting for you!

As you can see, reading effectively is extremely important for learning anatomy. Fortunately, you can do it quite easily by using a specifically designed method like the SQ3R. Don't be someone who takes reading for granted. By improving it, you can unlock your true learning potential.

Step 5:
Use mind maps



What are mind maps and how can they help you learn anatomy? Did you know that creative geniuses like Leonardo da Vinci, Galileo, and Albert Einstein used them constantly to elaborate their ideas?

A mind map is an organizational thinking tool - a Swiss army knife of the brain. Exactly as the name implies, it is a map reflecting what is present inside your brain.

Michael Michalko, a renowned creative expert described it as “the whole brain alternative to linear thinking, [which] reaches out in all directions and catches thoughts from any angle”.

A mind map looks exactly like a map of a city. The most important idea, or the city center, is situated in the middle. Major branches, or main roads, radiate out of the city center and they represent your primary thoughts. Smaller, secondary thoughts branch out from the primary ones and so on. Images, symbols, and scribbles are placed on some branches to facilitate your learning. Just like a city has interesting sites, buildings, and tourist attractions worth stopping at and admiring.

The principle behind mind maps is radiant thinking, which is very similar to how your brain works. It is easiest to understand this idea with an example. If you start thinking of the heart, your mind will instantly bring into consciousness its location (enclosed by the pericardium, in the thorax), its function (pumps blood), the chambers (atria and ventricles), innervation (cardiac plexus), and so on.

If you focus your learning on the vertebral region, this will hopefully prompt you to think about the spinal column.

From here, you may want to study each individual vertebrae and the connected structures, such as facet joints and intervertebral discs. You can then focus on one of these ‘smaller’ ideas and continue to develop it further, or you can go back to the initial idea about the vertebral region and take your learning in a different direction, this time by focusing on something like the muscles attached to the lumbar vertebrae.

... You get the idea. New and old information is constantly ‘hooked’ onto an already existing one, which acts to build up a map. Knowledge is organised like a spider web inside your mind, allowing you to link seemingly unrelated topics together.

Creating a mind map is a very natural and intuitive process because it is a reflection of what goes on inside your brain.

The use of mind maps is a great way to make links between topics which may initially appear unconnected.

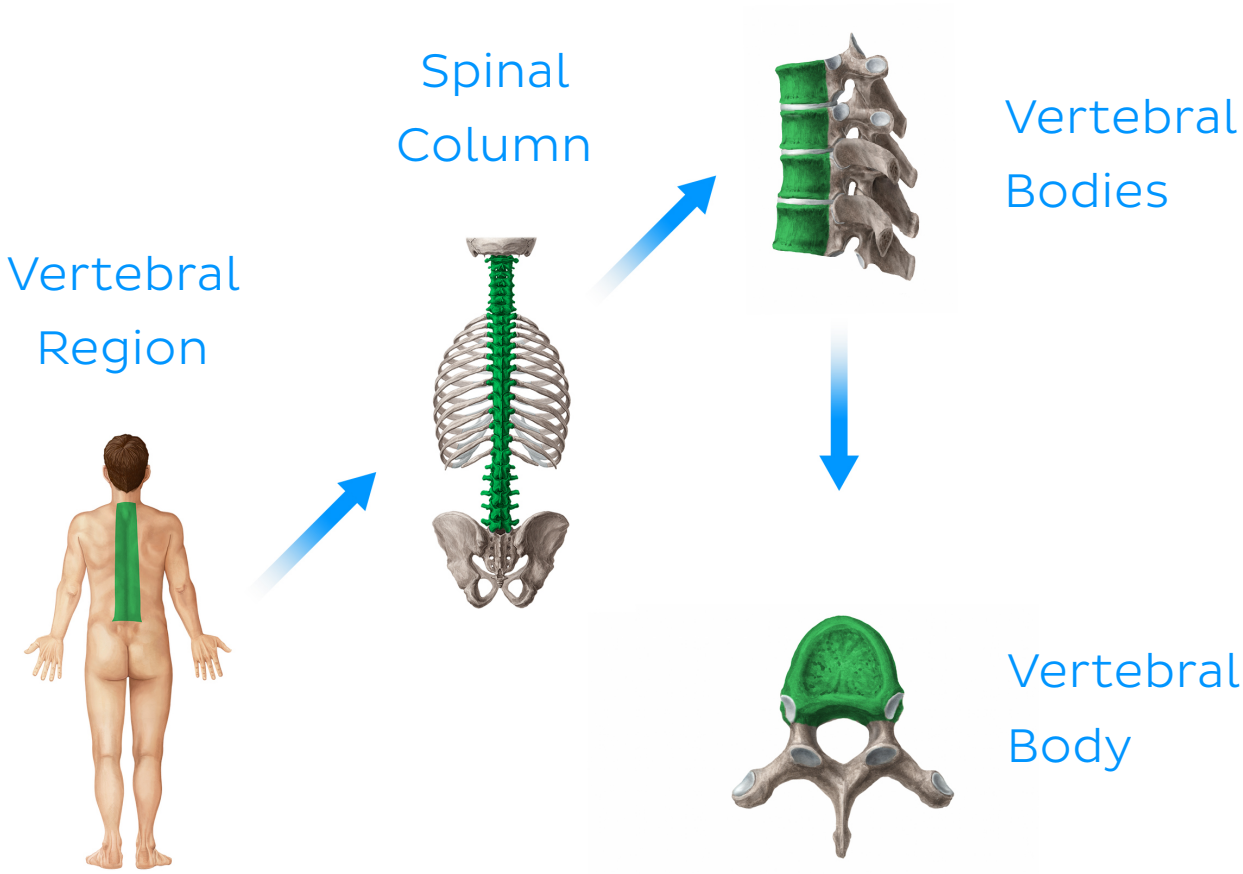
Mind maps are another potential learning strategy that you can use to learn anatomy. Being the Swiss army knife of the brain, they can filter out the essential information, organise it clearly, create associations, and inject some fun into the process.

Actually, not following a series of defined steps is the whole idea behind mind maps - they should just flow naturally according to your imagination and the associations your brain creates. Perfect for procrastinators, as it avoids the feeling of having to rigidly labour over one topic at a time.

Just make sure that you incorporate the following aspects:

- **Colours**
- **Images**, pictures or sketches
- Curved and organic **lines**
- **Keywords** only
- **Branch out** from the center in decreasing order of importance

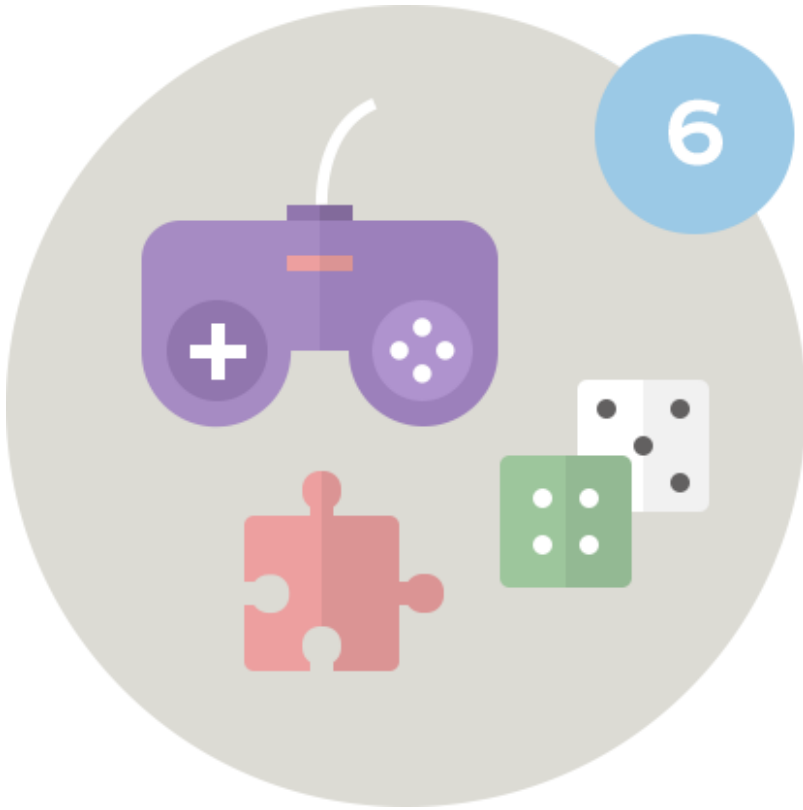
To give you an idea, a mind map of the vertebral region is shown below:



It is possible to create mind maps electronically on your computer or your favorite portable device - So don't worry if you can't draw like da Vinci! In fact, special tools aren't needed at all. Quick and simple sketches are enough to make a connection. In addition, anatomy offers an amazing tool that many students have a love-hate relationship with. This resource is an atlas and it can be the inspiration for all your anatomical drawings. For instance, the images in the above mind map are from Kenhub's atlas, a collection of clear and professional illustrations that will help you learn anatomy with ease.

Mind maps are another potential learning strategy that you can use to learn anatomy. Being the Swiss army knife of the brain, they can filter out the essential information, organise it clearly, create associations, and inject some fun into the process. They might be exactly what you need to stimulate your learning!

Step 6:
Learn anatomy while playing games



“It is paradoxical that many educators and parents still differentiate between a time for learning and a time for play without seeing the vital connection between them.”

- Leo F. Buscaglia

This quote, written by an American author and motivational speaker, resonates throughout the world of today’s learning.

“It is paradoxical that many educators and parents still differentiate between a time for learning and a time for play without seeing the vital connection between them.”

Leo F. Buscaglia

From a very innocent and early age, your parents, family and teachers have drawn a very clear and distinct line between learning and playing. Commands like “It’s time to end your game and start doing your homework” or “Are you playing again? For heaven’s sake, you’ll get nowhere in life with your laziness!” were probably a daily occurrence in your childhood.

… And so, we learn to separate work from play. Boo.

Luckily, not all hope is lost. Possibilities do exist to make your learning different, fun and enjoyable. Check out the suggested games below to get you started!

- **Matching term and image –** If you have ever learned a new language then you are familiar with this. You simply need to match each image with its corresponding term. Doing this online is even better because the cards keep flipping and turning their backs to you, so you have to mentally keep track of what each one shows.

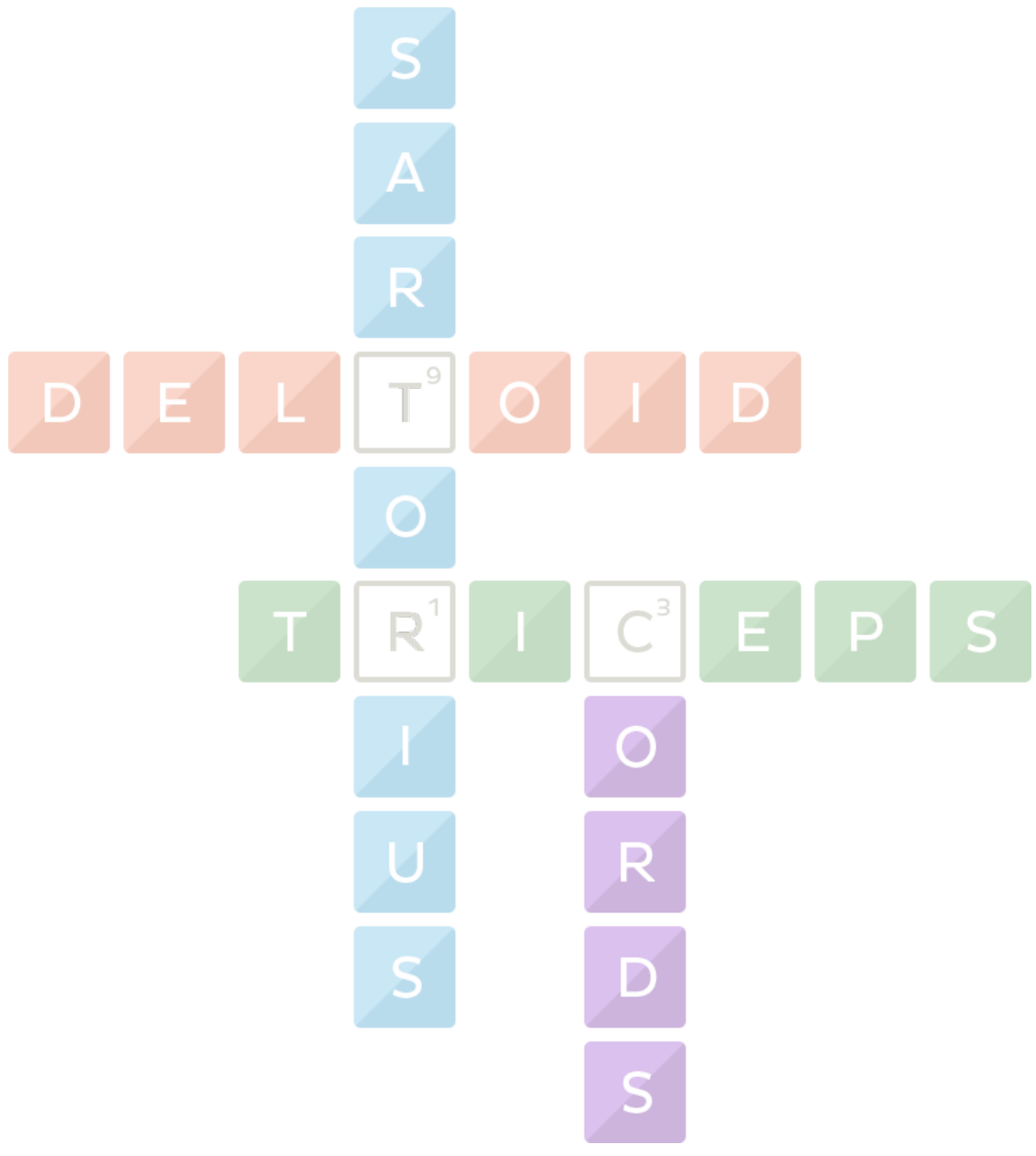
- **Crosswords –** Unlike the ones in your morning newspaper, anatomy crosswords are a fun way to learn new terms and how to spell them.

- **Hangman –** Stop yourself from getting hanged by knowing the anatomy word. Excellent for revising terminology.

- **Scrabble –** Master your anatomy vocabulary by chaining words together. Words are usually quite long in this subject so winning is not far fetched.

- **Anatomy Arcade –** The paradise of anatomy games. It is an online collection offering you jigsaws, crosswords, word-search, matching and much more! You can even whack a bone or poke a muscle! Have a go and learn with a smile.

- **Kenhub quizzes –** Learn anatomy while answering Kenhub quizzes? Yes, it can be done! And we will explain exactly how later on in this eBook.



As you can see, it is definitely possible to learn and have fun at the same time. Using a collection of different -and fun!- learning methods is the best way to reach the finish line in the anatomy marathon.

If you’re finding your anatomy learning a little dry, try one of Kenhub’s fun anatomy quizzes!

Step 7:
Learn anatomy with a coloring book

Memorizing anatomy from blocks of text requires time and a lot of repetition - and there's no changing that. However, there *is* a way to reduce the hardship - and that is by using an anatomy coloring book.

An anatomy coloring book has a simple format. It has black and white anatomical diagrams waiting to be colored. These diagrams, rather than being randomly arranged, are organised very precisely and logically.

The subject matter inside the book is organised into sections, with each section containing many topics. Each topic is presented on a single page full of anatomical illustrations and specific terminology associated with these drawings. A column of text is written on the following page after each topic, providing more details in a written rather than visual form.

Cerebrum Brainstem Cerebellum

Using a coloring book is very easy. It only requires you to follow a set of simple steps:

- **Choose a section** that you wish to study. For example, if the nervous system is on the menu for this study session, you would go to the first page titled “Nervous System” and begin the colouring fun.

- **Read the coloring notes** on the first illustration *before* you dive into coloring. This step is essential because you need to color the structures in a specific order to take advantage of the book’s structure and build your knowledge as a pyramid. For instance, for the “Nervous System”, on the “Organization” page you would first and only color the names and structures of the central nervous system (CNS). Then you would color the cranial nerves and the associated names and lastly you would color the spinal and autonomic nerves, which are part of the peripheral nervous system (PNS). This way, you learn one system or region at a time and avoid confusion.

- **Start coloring** the “Organization page” while following the coloring notes and system.

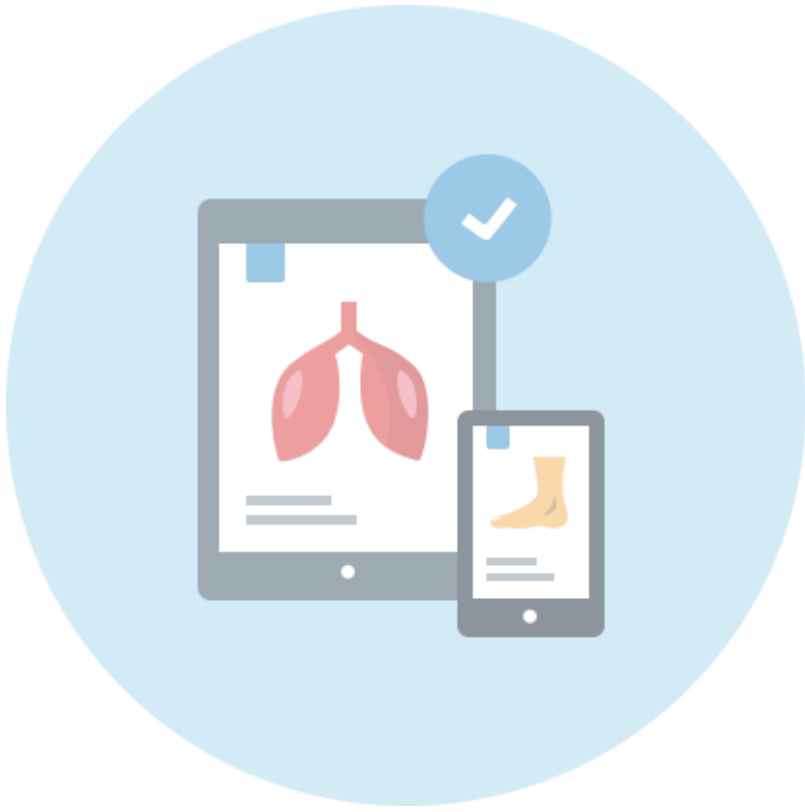
- **Read the text and explanations** following the "Organization" page to learn more details about the CNS, PNS, motor and sensory neurons and autonomic nervous system. This would provide more details about all the structures you colored since the only thing you know about them so far are the names, what they look like and where in the body they are situated.

- **Continue** to the next page called "Functional Classification of Neurons" and repeat all the steps again. It is essential to follow the illustrations in the right order rather than skip them. You need to first understand the basic organization of the nervous system before you can begin to functionally classify the neurons. And only then you can start learning about synapses and transmission.

An anatomy coloring book can surely prove to be a beneficial addition to your learning arsenal. More like a sharp blade than a Swiss Army knife, it helps you memorize anatomical structures in an easy and fun way, creating colourful relationships between narrow strings representing nerves and long names like zygomaticotemporal nerve.

Linking specific colours with specific structures is a great way to associate structure with function.

Start using Kenhub today



After reading all these tips, tricks and mind hacks (you did read all of them - didn't you??), you might be wondering where to start. You may know that you need to learn the muscles and the bones of the upper limb but one look at your textbooks and you feel alone and scared again. Well, stay calm. We are here to help you.

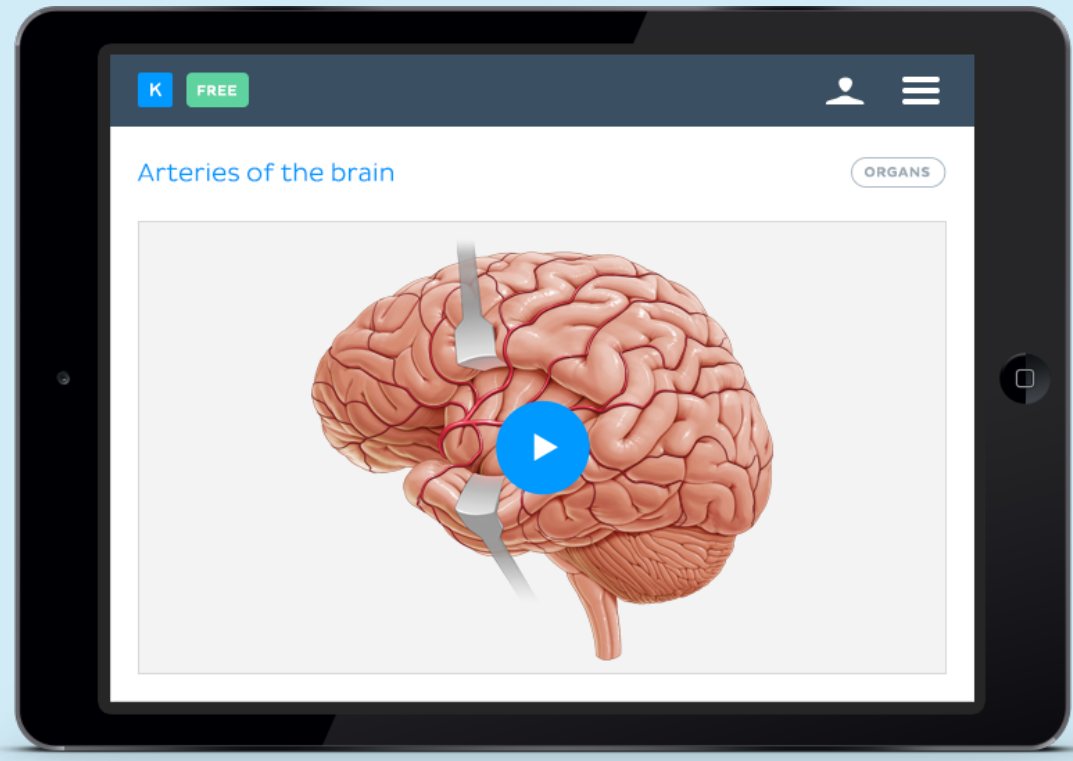
We designed and are constantly improving Kenhub with users like you in mind.

We want to make your learning not only easy and efficient, but fun, too. Kenhub, unlike other tools and apps, is an *all-in-one solution* for learning anatomy and histology. At Kenhub we don’t leave you alone in this process; we don’t give you just a skeleton model, or a “3D muscular model” to play around with and scroll infinitely with no direction. We don't let you get lost as you try to understand what the function of a given muscle is, or as you try to memorize every last detail. No, we have a completely different view of education. We want to become your guide. We want to explain everything you need, and help you memorize all of these new terms.

In order to achieve that, we offer not just one, but four different types of content for each topic so that you don’t get bored - video tutorials, illustrations, articles and interactive quizzes. Let’s take a look at what each of these learning methods provide.

1. Video Tutorials:

Think of these tutorials as a friend, who guides and explains the specific topic in the most easy-to-follow way. We use as simple language as possible, and we try to explain everything from scratch.

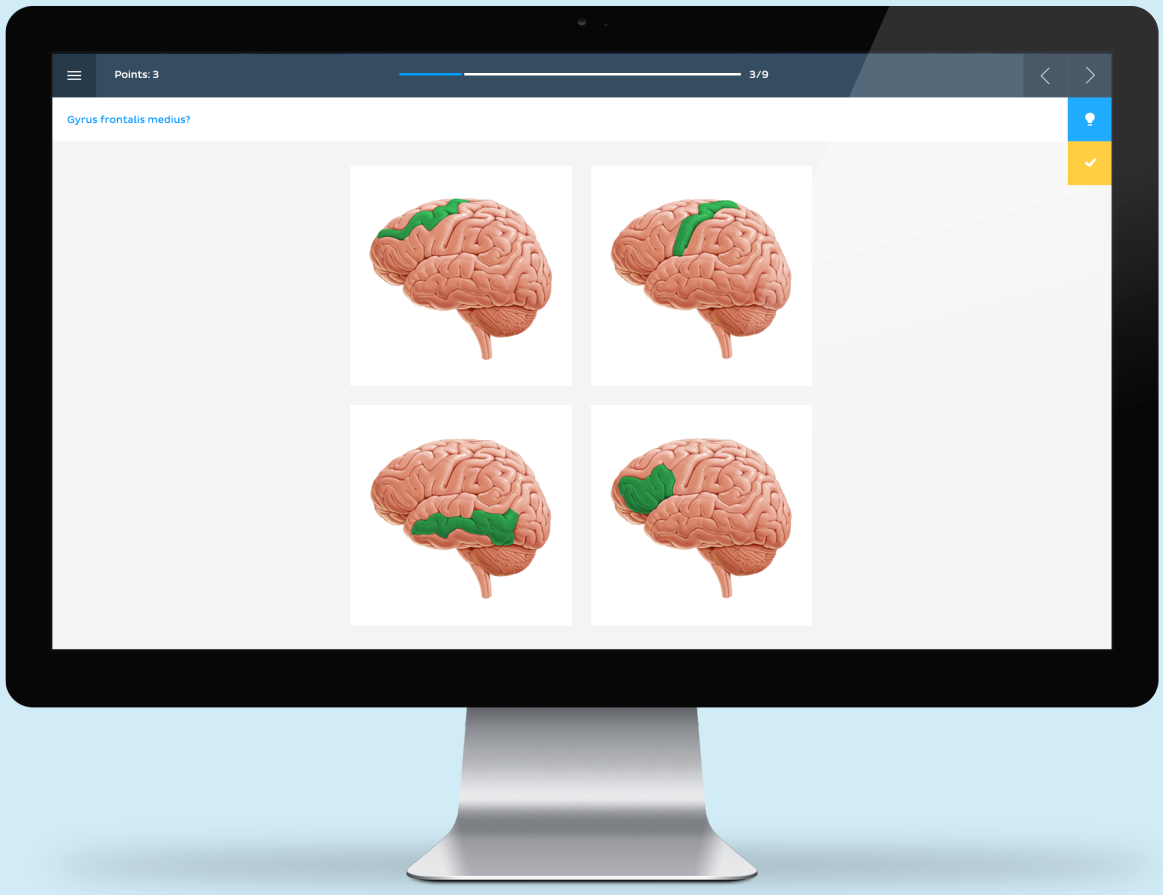


Watch these videos as many times as you want. You can go back and forth and you can even see the transcript of the video in order to better follow your guide. The videos cover most topics, from the simplest ones, to the most advanced and complicated.

Not enough time? Increase the play speed and cover the material in a fraction of the time! Explanations too fast? Slow it way down!

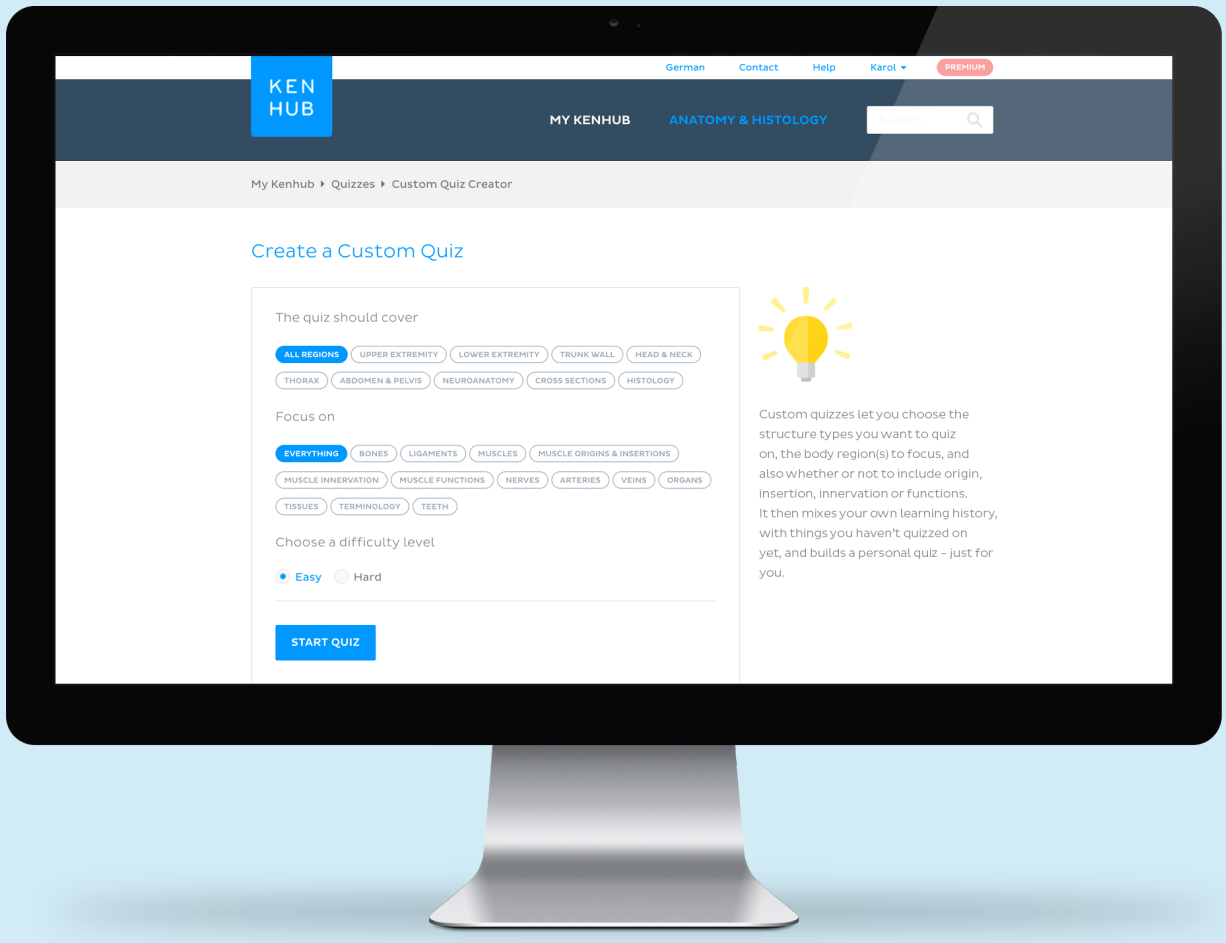
2. Quizzes:

Next stop: quizzes! You watched the video and you got an idea of the topic. But now you need to memorize the terms and the relations. Kenhub quizzes are specifically designed for easier learning and more fun. Unlike the quizzes from other tools or apps that are designed to test your knowledge, with our quizzes you can actually learn the topic, without having any prior knowledge. They follow a proven logical approach and they guide you step by step in order to memorize terms and understand the concepts.

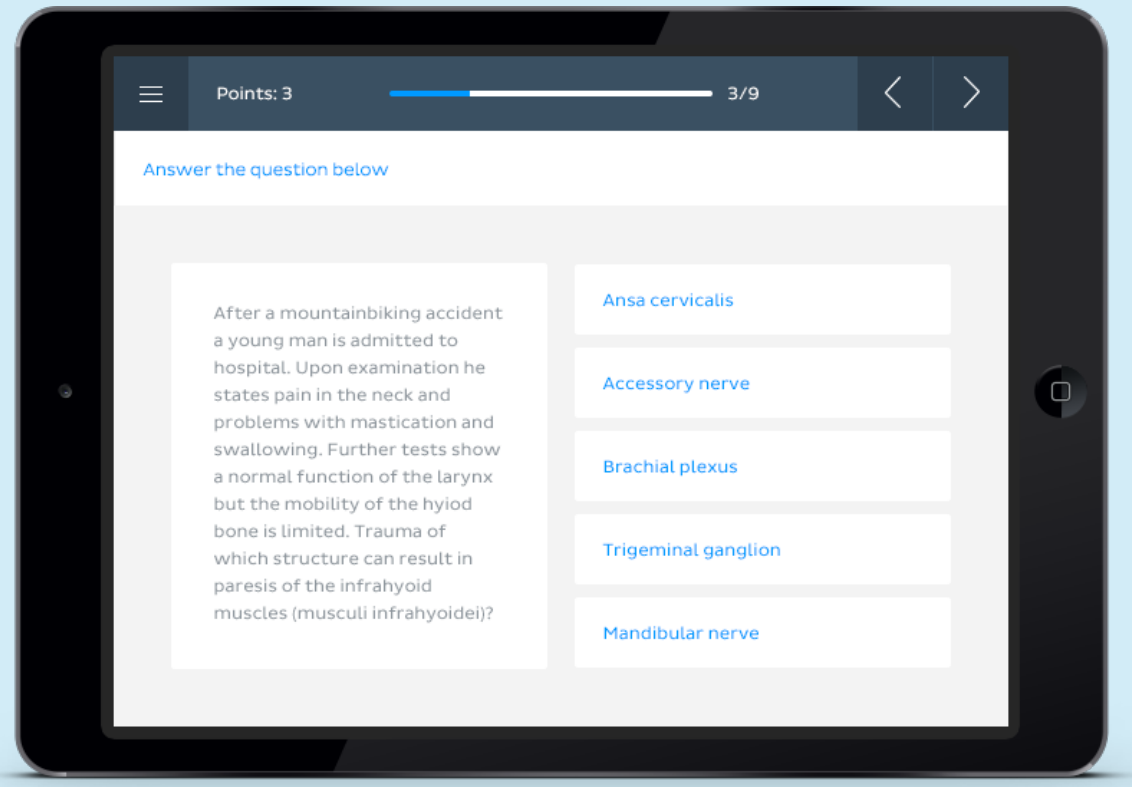


You can choose from a long list of more than 400 interactive quizzes. These “smart” quizzes adapt to your knowledge and they use sophisticated algorithms. This makes sure you are exposed to the same information in a multitude of ways to ensure that you understand the concept. The quizzes are designed to allow you to repeat questions in areas that you are not so confident on, until you grasp the concept (you remember “spaced repetition”, right?)

Another very cool feature is the custom quizzes. That means that you can “build” your own quizzes. So, if you want to review in detail the muscles of the upper limb, you have the option to build a quiz according to your needs.



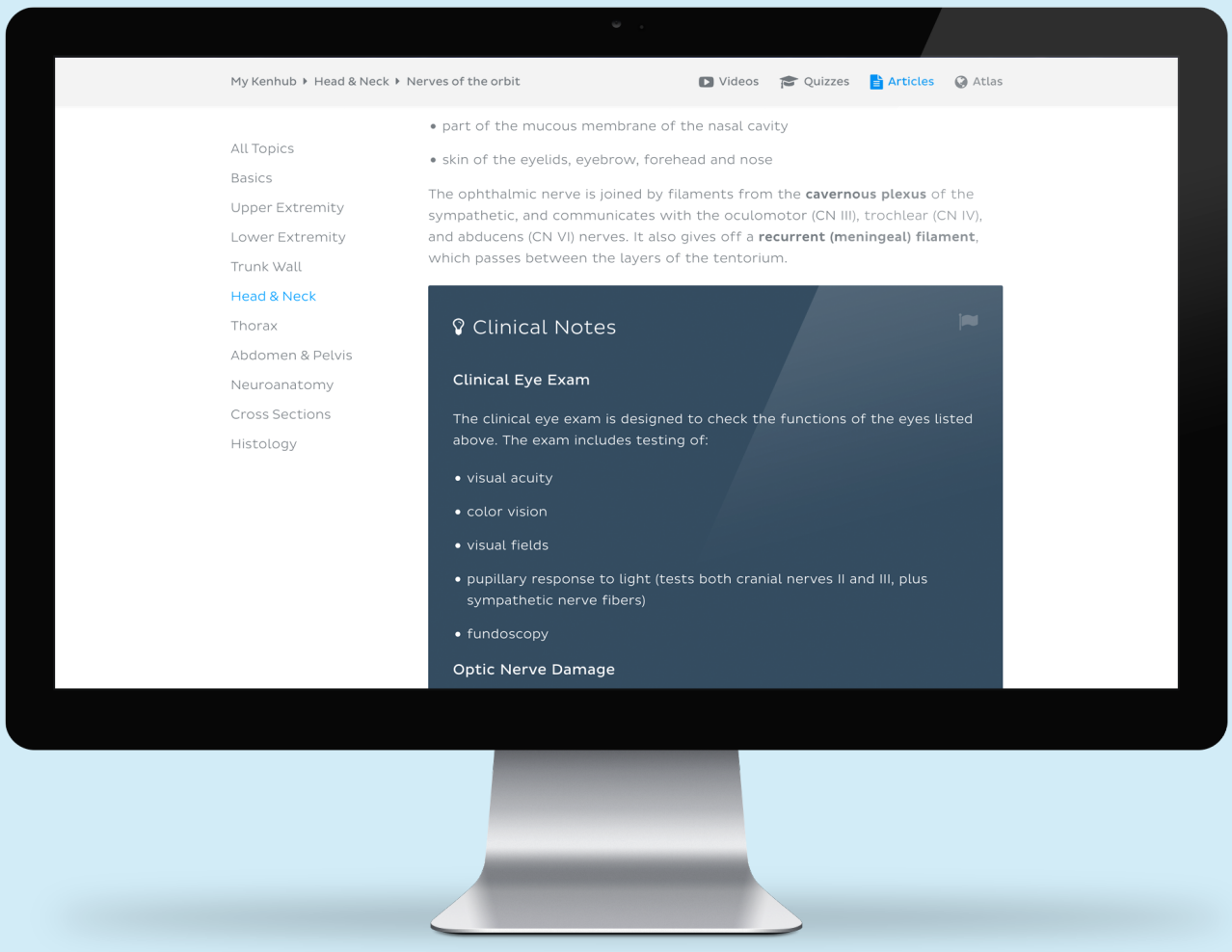
Last, but not least, there are hundreds of questions for clinical cases. If you are preparing for USMLE or other clinical related exams, you should try these questions!



Did you know? Kenhub's quizzes don't just test, but help you learn from scratch. Start building your knowledge with our 2nd order quizzes about origins, insertions, innervations and functions.

3. Articles:

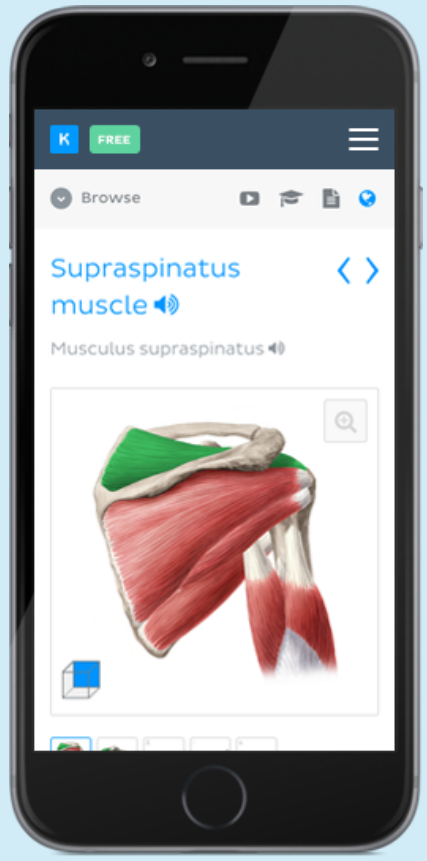
If you want to dive deeper into a topic, you should also take a look at Kenhub's articles. There are hundreds of illustrated articles that go into detail and explore not only the anatomical aspects of the topics, but also the relevant clinical conditions.



Don’t simply read! Watch the embedded videos inside the articles narrated by our expert anatomy geeks.

4. Atlas:

Kenhub offers you one of the most complete anatomy and histology atlases, completely for free! There are tons of images for more than 4000 anatomy and histology terms. Just select the region and the specific term, and you will see images in illustration format, cadaveric images and radiological images as well as the English and Latin names. But wait- it gets even better! You can hear how terms are pronounced, too! Feel free to use it on your smartphone or tablet so you will always have the most complete atlas by your side (even in the operation room!)



Did you know? Kenhub’s atlas illustrates the structures from different perspectives, making you ready to tackle your next exam from every angle!

5. Support:

Most of us here at Kenhub are students or instructors ourselves, so we know how important it is to have someone by your side when you need help. That's why we'll always be here to offer you expert advice on how to study better and avoid all the common mistakes when learning anatomy. No other anatomy learning platform offers this level of support. Feel free to shoot us an email and we will get back to you as soon as we can- usually within a couple of hours.

Kenhub's support team can help you to create a personalised study plan based on what you need to learn.

START LEARNING WITH KENHUB

Final words

So, there you have it! An ‘Ultimate Anatomy Study Guide’, completely free and ready to hold your hand and guide you every step of the way. Similar to a teacher, it shows you not only **what** to study, but also **how** to do it, which is what separates the wheat from the chaff when it comes to learning anatomy. After all, the difficulty faced by many students stems from using ineffective study methods, rather than the material itself.

Here's what you've covered:

Mental preparation – anatomy is no ordinary subject, so you can't simply tackle it head on! You need to be aware of what to do and what to avoid.

- **Stop procrastinating** by rewarding yourself and tricking your emotions.
- **Study smart** rather than hard using spaced repetition.
- **Improve your memory** by reflecting upon what you've learned for 40 seconds.

Learning strategies – some tips and tricks to inject some variety into a dull and challenging subject like anatomy.

- **Read effectively**
- **Use mind maps**
- **Play games**
- **Incorporate colour**

Kenhub's top-notch study materials - readily accessible and educationally connected to make your learning even easier.

- Videos
- Quizzes
- Articles
- Atlas

START LEARNING WITH KENHUB

Luckily for you, the above compilation is only the tip of the iceberg. The good news? There are a lot more learning strategies waiting for you on our website. The *best* news? We have even more of these in the pipeline, ready to make your learning even easier. Keep a close look on the learning strategy section so you don't miss out on them! Don't keep this little secret to yourself. Share it with your friends now!

We hope you enjoyed this e-book and good luck with your studies!