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# Exploring the Digital World of Anatomy: A Comprehensive Review of Complete Anatomy 3D App

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**How to cite this article:** Natasha Verma, Sandhya Nagolu, Jeyakumar. Exploring the Digital World of Anatomy: A Comprehensive Review of Complete Anatomy 3D App. International Journal of Contemporary Medicine/Volume 12 No. 2, July-December 2024.

## Abstract

Complete Anatomy, an educational 3D anatomy platform developed by 3D4 Medical, has been in the business of creating medical products since 2009. Their educational content undergoes rigorous scrutiny from an academic review board comprising anatomical experts and clinical practitioners with extensive experience in hospital settings and academic institutions worldwide. This platform serves as a valuable resource for a wide range of users, including students, educators, medical professionals, and academic institutions. With over one million users utilizing its interactive anatomy models, clinical video animations, and virtual dissection tools, Complete Anatomy has become an indispensable tool in the realm of anatomical education.

In the spring of 2019, Complete Anatomy expanded its offerings to include interactive anatomy courses, effectively becoming a publishing platform for such content [1]. These courses are designed to cater to the needs of academic faculty as they develop curricula. Simultaneously, they are also accessible to students who can use them as standalone resources to review material. The Complete Anatomy app, which has received recognition as the recipient of an Apple Design Award, offers a dynamic and engaging approach for students to delve into anatomy's intricacies, surpassing traditional atlases' limitations.

**Keywords:** Complete Anatomy, 3D4Medical, anatomy platform, medical education, academic review board, interactive anatomy courses, Apple Design Award.

## Content

The content available within Complete Anatomy is subject to subscription levels, but all subscriptions revolve around its core interactive anatomy atlas, featuring an array of remarkable features. These include comprehensive gross anatomy models, microscopic representations of tissues and cells, a dynamically pulsating heart model, realistic

simulations of muscle motion, and detailed bone mapping, complete with clear and precise labels for anatomical parts, surfaces, and landmarks.

Within the platform, users have the ability to isolate specific body regions, meticulously trace the intricate pathways of arteries and nerves, and gain insight into the nerve supply of muscles through the Innervation Pathway tool. This tool simplifies the

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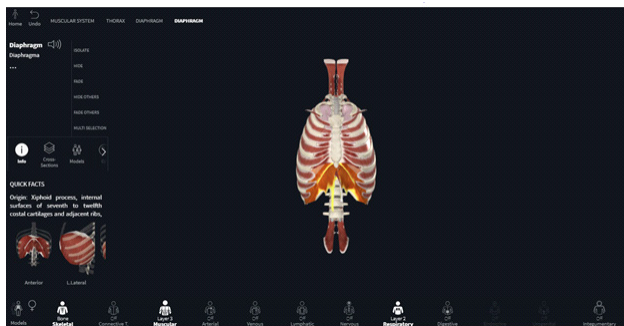
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process by allowing users to effortlessly visualize the innervating nerves of a muscle, as well as the option to either isolate or conceal the nerve pathway for a more focused view.

Furthermore, users can personalize their anatomical exploration by selecting one or more of the twelve available body systems. These encompass skeletal and connective tissues, the muscular system, the vascular system (both venous and arterial components), the lymphatic system, the nervous system, the respiratory system, the digestive system, the endocrine system, the urogenital system, and the integumentary system. This extensive range of options allows users to delve into the specific aspect of anatomy that aligns with their learning or research needs.

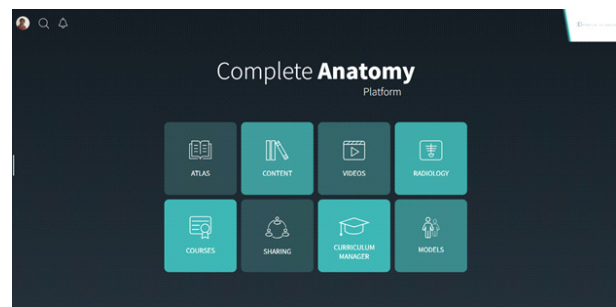
One notable feature of Complete Anatomy is its Augmented Reality (AR) mode, which enables users to virtually place the anatomical model onto any flat surface. This immersive AR experience enhances the understanding of anatomical structures by allowing users to interact with them in real-world settings. Additionally, the platform offers a multiuser Augmented Reality mode, facilitating collaborative learning and exploration (Figure 1).



**Figure 1- Augmented Reality of Diaphragm**

Medical educators have a wealth of resources at their disposal within the Complete Anatomy app to enhance their teaching materials and methods. The platform offers preset dissections that can be seamlessly integrated into lectures and online educational materials. Additionally, educators can tap into a vast library of over 1,500 videos and audio recordings. These resources cover a wide spectrum of medical topics, with videos thoughtfully categorized into specialized areas such as cardiology, orthopedics, ophthalmology, dentistry, and fitness.

Complete Anatomy further facilitates the teaching process with interactive lecture slides that can be used as-is or customized to align with specific classroom requirements. For educators, the platform also introduces the Curriculum Manager module, which becomes accessible with the purchase of an Educator license. This module not only grants access to a plethora of interactive learning resources but also empowers educators to create and share their own learning materials with colleagues and students. Operating akin to a learning management system, the Curriculum Manager enables educators to establish specific groups for sharing courses and resources. Additionally, the platform provides a Dashboard feature, allowing educators to monitor student activity, including quiz results, attendance, and progress through shared materials (Figure 2).



**Fig 2- Dashboard of complete anatomy app**

Navigating the Complete Anatomy app on mobile devices is an intuitive experience, enhanced by the availability of tutorials on the 3D4Medical website. Users can easily manipulate and rotate the selected anatomical model using their fingers on mobile devices or a mouse and keyboard when on a computer (Figure 2). Upon selecting an anatomical structure, users are provided with comprehensive information about it, an audio recording for correct pronunciation, and tools for navigating the structure. Activating the Motion option for a structure initiates a mode that illustrates realistic structural motion and articulation. Moreover, users have the flexibility to toggle the beating heart on or off with a simple double tap on mobile devices or a double click with the mouse, adding an extra layer of interactivity to their learning experience.

The central menu within the Complete Anatomy app, commonly referred to as the "Hub," serves as the dashboard for users and is readily accessible from

the model view. Additionally, users benefit from the convenient “Recents” bar, which smoothly slides in and out from the left-hand side of the app while users are in the “Hub” view. This feature simplifies the process of locating items that users have previously accessed during their sessions. To further assist users in navigating the extensive range of functionality options, helpful tips can be accessed by clicking on the question mark icon in the model view. These tips offer brief video walkthroughs, enhancing the user experience. It’s worth noting that while users can mark videos and specific content in the Complete Anatomy Library as favorites by tapping a heart icon, the process of relocating these items may require some exploration, as it is not entirely intuitive.

When exploring the gross anatomy models, users have access to a diverse array of tools. These tools encompass annotation capabilities, cutting tools that enable both the removal of layers and the addition of fractures, and growth tools, including the option to simulate bone spurs. Furthermore, there is a pain sphere tool that aids in visualizing areas of pain on specific regions of the body. Users can effortlessly search for specific anatomical areas from any screen using the search function. Notably, models are available for offline use, and any changes or additions made to files while offline will synchronize with

the app the next time the user connects to the Internet. However, access to courses, content, and videos within the app requires an active Internet connection.

The Systems menu, conveniently located at the bottom of the screen, provides access to various anatomical systems. Users can navigate through the layers of each system using the plus and minus buttons located above the system representation. Clicking or tapping on the system buttons offers a quick and efficient way to enable or disable specific systems as needed.

## COURSES

Within the Complete Anatomy platform, educators enjoy the dual advantage of being able to create their own course content using the Curriculum Manager while also gaining access to pre-existing, fully developed courses housed within the Complete Anatomy Library. These courses are part of the

premium subscription levels, which encompass Student Plus, Educator, or Professional licenses. Currently, there are 15 courses available in the library, offering users access to over 150 hours of lectures and videos. These courses serve as valuable resources that can be integrated into educational curricula, used as supplementary materials, or aid in exam preparation. Importantly, the course content is expected to expand significantly within the upcoming year, providing even more comprehensive educational resources.

In addition to courses, the Complete Anatomy Library boasts a collection of 130 pre-built quizzes, thoughtfully color-coded to indicate varying levels of difficulty. User ratings for these quizzes are prominently displayed in the thumbnail view, allowing educators and students to make informed choices regarding quiz selection. Furthermore, users have the flexibility to view individual quiz questions, incorporate them into customized groups, and make edits within those groups. This feature enhances the adaptability and customization of the quiz content to meet specific learning objectives and preferences.

## TARGET POPULATION

The Complete Anatomy app serves a versatile role, catering to various user groups. It offers a valuable learning resource for students seeking to deepen their understanding of anatomy. Educators can leverage it to create lectures and provide relevant educational material. Medical professionals find it useful for educating their patients, while institutions have the option to integrate Complete Anatomy into their curricula and educational offerings.

In the reviewer’s assessment, Complete Anatomy presently excels as a learning tool with certain teaching capabilities. Ongoing and forthcoming developments indicate a shift towards enhancing Complete Anatomy into a comprehensive educational platform, particularly for those who wish to utilize it as a teaching tool.

## Conclusion

Complete Anatomy stands as a formidable and remarkable resource, primarily catering to students looking to enhance their traditional medical education. It offers an array of 3D models and tools that serve as potent supplements to reinforce their

classroom and laboratory learning experiences. Utilizing Complete Anatomy effectively transforms the cadaver experience into a portable and accessible resource on mobile devices, bridging the gap between students and the anatomy lab.

In the realm of education, Complete Anatomy plays a pivotal role for educators. It serves as a foundational platform for constructing curricula, featuring a wealth of pre-built lessons and slides contributed by anatomy educators worldwide. This collaborative approach enriches the teaching experience by incorporating insights and materials from a global community of experts.

For educators working within established learning management platforms like Canvas or

Blackboard, the precise functionality of Complete Anatomy within these systems remains a subject of ongoing exploration and development. The full extent of how its educational features seamlessly integrate with existing systems is yet to be fully realized.

**CONFLICT OF INTEREST:** NIL

**FUNDING:** SELF

**ETHICAL CLEARANCE:** Narrative review studies typically do not require ethical clearance.

### **References**

1. 3D4 Medical launches Complete Anatomy as a publishing platform<sup>1</sup>.
2. System requirements for Complete Anatomy are available on the 3D4Medical website<sup>2</sup>.