

Cite this article as: Riva MA, Belingheri M, Paladino ME. Evolution of chest defense in the Roman era. *Interdiscip CardioVasc Thorac Surg* 2024; doi:10.1093/icvts/ivae075.

## Evolution of chest defense in the Roman era

Michele Augusto Riva <sup>a,b,\*</sup>, Michael Belingheri <sup>a,b</sup> and Maria Emilia Paladino <sup>a,b</sup>

<sup>a</sup> School of Medicine and Surgery, University of Milano-Bicocca, Fondazione IRCCS San Gerardo dei Tintori, Monza, Italy

<sup>b</sup> Occupational Health Unit, Fondazione IRCCS San Gerardo dei Tintori, Monza, Italy

\* Corresponding author. School of Medicine and Surgery, University of Milano-Bicocca, Fondazione IRCCS San Gerardo dei Tintori, Via Cadore, 48, Monza 20900, Italy. Tel: +39-0264428313; e-mail: michele.riva@unimib.it (M.A. Riva).

Received 13 September 2023, received in revised form 15 April 2024

**Keywords:** History of Medicine • Roman Era • Chest • Heart • Cardiophylax • Armour

Throughout human history, the chest and its contents, particularly the heart and lungs, have been among the most vital parts of the body to protect during battles. In a recent article, Chicco and Tebala attempted to analyse war traumas as depicted in Homer's 'Iliad', written in the ninth century BC [1]. Chest injuries accounted for 16.2% of the total injuries, less frequent than injuries to the head and neck (27.0%) and limbs (20.9%). Despite their lower frequency, chest injuries were often more lethal, likely due to the higher kinetic energy associated with such injuries compared to those in other regions [1]. This understanding led ancient populations to recognize the importance of chest protection, resulting in the development of the earliest armour, primarily designed to safeguard this critical area.

The evolution of armour among Italic populations from the seventh century BC to the Roman era reveals a progressive increase in the emphasis on chest protection over the centuries. While since the fifth century Greek body armour took the form of full-bodied muscle cuirasses, the armour used by ancient Italic populations from the seventh to the fourth centuries was more straightforward, offering less protection. It consisted of a pectoral disc with a diameter ranging from 20 to 50 cm, secured by straps. This type of armour was known as a 'cardiophylax' (καρδιοφύλαξ), as it protected (-*phylax*, φύλαξ) the heart area (*cardia*-, καρδία) [2]. Circular pectorals started to appear in Etruscan contexts in the seventh century, extending south into Latium and east into Umbria. These pectorals were crafted from copper-alloy disks with concentric corrugations, surrounded by small holes for attaching strap fittings [3].

The pectoral plate was fastened to the warrior's body through a system of crossed straps passing over the shoulders or around the fighter's waist, or sometimes a single shoulder strap. Increasingly, a rear plate accompanied the frontal plate, serving to defend the warrior's back as well. An illustrative example of a cardiophylax covering both chest and back can be found in an ancient statue commonly referred to as the 'Warrior of Capestrano' (Fig. 1A) [4]. This limestone statue, dating back to around the first half of the sixth century BC, depicts a Picene warrior equipped with weapons and armour.



**Figure 1:** (A) The 'Capestrano Warrior'. Sixth century BC. Museo archeologico nazionale d'Abruzzo. Chieti, Italy (Sailko/Wikimedia/Public Domain). (B) Samnite Bronze Cuirass Body Armor, from South Italy. Fifth century BC (Gary Todd/Wikimedia/Public Domain). (C) An anatomical cuirass, from a burial at Lanuvium, Rome. Fifth century BC (Ursus/Wikimedia/Public Domain).

In subsequent centuries, the size of the cardiophylax progressively increased. Among Italic populations, especially the Sannites, the 'triple-disc' armour gained popularity in the fourth century (Fig. 1B) [2]. This armour type, prevalent in southern Italy and influenced by the Greek world, provided comprehensive protection for the entire chest region, not limited solely to the cardiac area. It featured a front and back plate connected by bronze joints, offering additional safeguarding for the combatant. The 'triple-disc' armour influenced another Roman armour type, characterized by a rectangular anatomical breastplate with stylized musculature (Fig. 1C). Both armour models were accompanied by a bronze belt designed to protect the abdominal region [2].

While Roman legionary armours became broader and more similar to Greek armours, circular pectoralia continued to be used during the Republican period, primarily by soldiers of lower economic status. The Greek historian Polybius (c.200–c.118 BC) described the use of this armour type by the Roman Army in the mid-second century: 'the common soldiers wear in addition a breastplate of copper alloy a span [228 mm] in diameter, which they place in front of the chest and call the heart-protector (cardiophylax), this completing their accoutrements; but those who are rated above ten thousand drachmas wear instead of this a cuirass (thorax) of mail' (Histories 6.23.14) [3]. Soldiers of more modest origins, unable to afford more sophisticated and costly armours, at least equipped themselves with a cardiophylax to shield their hearts. In the Roman era, these metallic disks were sometimes lined with a soft and spongy layer of wool or felt (*spongia pectoris*), placed inside the cardiophylax to provide cushioning. The exact date of the cardiophylax's abandonment by the Roman military is uncertain, but it likely fell out of use during the first century BC [3].

In conclusion, the evolution of armour throughout human history has been intricately intertwined with the growing understanding of the vital significance of protecting the chest in warfare. Since ancient times, humans have recognized that preserving the heart and lungs during combat is essential for survival on the battlefield. This awareness found expression in early armours, with a particular emphasis on the thoracic region. The history of armour and the awareness of the need to protect the chest in ancient medicine provide a fascinating example of how the evolution of technologies and tactics is closely linked to the health and survival of warriors. Armours, from the humble

'cardiophylax' to the sophisticated Roman cuirasses, became tangible reflections of the ever-deeper understanding of human vulnerabilities and the constant quest for ways to mitigate them—an enduring theme that remains relevant even in modern contexts of military medicine and security (e.g., bulletproof vest). Ultimately, this research underscores how sculptures, such as the Warrior of Capestrano, and the broader domain of fine arts, can provide invaluable insights into unravelling the ancient medical history [5–8].

## FUNDING

No funds are received for this article.

**Conflict of interest:** none declared.

## DATA AVAILABILITY

All relevant data are within the manuscript and its Supporting Information files.

## REFERENCES

- [1] Chicco M, Tebala GD. War trauma in Homer's Iliad: a trauma registry perspective. *Eur J Trauma Emerg Surg* 2021;47:773–8.
- [2] Travis H, Travis J. *Roman Body Armour*. Stroud, UK: Amberley Pub Plc, 2011, 26.
- [3] Bishop MC. *Roman Plate Armour*. Oxford, UK: Osprey Publishing, 2022, 7.
- [4] Feugere M. *Weapons of the Romans*. Oxford, UK: Tempus Pub Ltd, 2002, 73.
- [5] Riva MA, Paleari A, Belingheri M. At the origin of "endocrinology and art": woman's head (third century BCE). *J Endocrinol Invest* 2020; 43:1673–4.
- [6] Bolis A, Belingheri M, Riva MA. Facial cleft in a Mayan Figurine. *J Craniofac Surg* 2019;30:2302.
- [7] Paladino ME, Riva MA. The sponge-bearer suffers from goiter: "The Passion of Christ" (c. 1530) by Fermo Stella. *J Endocrinol Invest* 2022; 45:1463–4.
- [8] Riva MA, Riva E, Spicci M, Strazzabosco M, Giovannini M, Cesana G *et al.* "The city of Hepar": rituals, gastronomy, and politics at the origins of the modern names for the liver. *J Hepatol* 2011;55:1132–6.