

**PROSPECTUS SUPPLEMENT**

(To Prospectus Dated December 8, 2023)

**SeaStar Medical Holding Corporation****Up to \$25 Million of  
Common Stock**

We have entered into an at the market offering agreement (the “Offering Agreement”), dated August 20, 2024, with H.C. Wainwright & Co., LLC, as sales agent (the “Sales Agent” or “Wainwright”), relating to the sale of our common stock, par value \$0.0001 per share (“Common Stock”), offered by this prospectus supplement and the accompanying base prospectus. In accordance with the terms of the Offering Agreement and this prospectus supplement and the accompanying base prospectus, we may offer and sell shares of our Common Stock pursuant to this prospectus supplement having an aggregate offering price of up to \$25 million from time to time through Wainwright acting as our sales agent.

Sales of our Common Stock, if any, under this prospectus supplement and the accompanying base prospectus may be made by any method permitted by law deemed to be “at-the-market” offerings as defined in Rule 415 promulgated under the Securities Act of 1933, as amended (the “Securities Act”), including, without limitation, sales made directly on or through the Nasdaq Capital Market (“Nasdaq”), the existing trading market for our Common Stock, or any other existing trading market in the United States for our Common Stock, sales made to or through a market maker other than on an exchange or otherwise, directly to the Sales Agent as principal in negotiated transactions at market prices prevailing at the time of sale or at prices related to such prevailing market prices, and/or in any other method permitted by law. If we and Wainwright agree on any method of distribution other than sales of shares of our Common Stock on Nasdaq or another existing trading market in the United States at market prices, we will file a further prospectus supplement providing all information about such offering as required by Rule 424(b) under the Securities Act. Wainwright is not required to sell any specific number or dollar amount of shares, but will act as a sales agent and use commercially reasonable efforts to sell on our behalf all of the shares of Common Stock requested to be sold by us, consistent with its normal trading and sales practices, on mutually agreed terms between Wainwright and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement. There is no minimum offering requirement. We provide more information about how the shares of Common Stock will be sold in the section entitled “Plan of Distribution.”

Wainwright will be entitled to compensation at a fixed cash commission rate of 3.0% of the gross sales price of the shares sold by it under the Offering Agreement. In connection with the sale of Common Stock on our behalf, Wainwright will be deemed to be an “underwriter” within the meaning of the Securities Act and the compensation of Wainwright will be deemed to be underwriting commissions or discounts. We provide more information about our compensation arrangements with the Sales Agent in the section entitled “Plan of Distribution.” We have also agreed to provide indemnification and contribution to Wainwright with respect to certain liabilities, including liabilities under the Securities Act. This offering pursuant to this prospectus supplement will terminate upon the termination by us or Wainwright of the Offering Agreement pursuant to its terms.

Our Common Stock and warrants exercisable for one share of Common Stock for \$287.50 per share (which does not include the Warrants) (the “Listed Warrants”) are traded on Nasdaq under the symbols “ICU” and “ICUCW,” respectively. On August 16, 2024, the last reported sale price on Nasdaq of our Common Stock was \$6.51 per share and the closing price of our Listed Warrants was \$0.06 per warrant.

On June 7, 2024, we effected a 1-for-25 reverse stock split (the “Reverse Split”) of our issued and outstanding shares of Common Stock, and the Company’s shares of Common Stock began trading on a split-adjusted basis on Nasdaq on June 10, 2024 under the same symbol “ICU”. All stock options and warrants of the Company outstanding immediately prior to the Reverse Split were proportionally adjusted except for the Listed Warrants and the private placement warrants that were issued as part of the SPAC transaction, which total 16,788,000 outstanding warrants in the aggregate (the “Unadjusted Warrants”). The Unadjusted Warrants retain an \$11.50 exercise price each and require the exercise of 25 warrants to purchase one share of Common Stock. Unless otherwise indicated, all share and per share prices in this prospectus have been adjusted to reflect the Reverse Split. However, Common Stock share and per share amounts in certain of the documents incorporated by reference herein have not been adjusted to give effect to the Reverse Split.

On June 14, 2023, we received a letter from the Nasdaq Staff notifying us that the market value of listed securities (“MVLS”) of our Common Stock had been below the minimum \$35,000,000 MVLS Requirement.

The letter also stated that we would be provided 180 calendar days, or until December 11, 2023, to regain compliance with the MVLS Requirement. On December 13, 2023, we received a notification from the Listing Qualification Department of Nasdaq that

we had not regain compliance with the MVLS Requirement and that our Common Stock would be subject to delisting unless we timely request a hearing before a Panel. On December 19, 2023, we submitted a hearing request to the Panel to appeal the delisting determination. On the same date, we received a notice from Nasdaq stating that its delisting action had been stayed pending a final written decision by the Panel and that a hearing would be held on March 12, 2024. On February 6, 2024, we received notification from Nasdaq that we had regained compliance with the MVLS Requirement.

---

On June 26, 2023, we received a letter from the Listing Qualifications Department of Nasdaq notifying us that the Company was not in compliance with the \$1.00 per share minimum Bid Price Requirement for continued inclusion on the Nasdaq Capital Market pursuant to Nasdaq Listing Rule 555(a)(2).

This letter had no immediate effect on the listing of the Company's Common Stock on Nasdaq and the Company had 180 calendar days from the date of the notice, or until December 26, 2023, to regain compliance with the Bid Price Requirement. On December 27, 2023, we received notification from Nasdaq that the Company had not regained compliance with the Bid Price Requirement and that the Panel would consider this matter in rendering a determination regarding the Company's continued listing on The Nasdaq Capital Market. Pursuant to Listing Rule 5810(d), the Company should present its views with respect to this deficiency at its Panel hearing to be held on March 12, 2024. If we failed to address the aforementioned issue, the Panel would consider the record as presented at the hearing and would make its determination based upon that information.

On February 21, 2024, the Company made a pre-hearing submission to Nasdaq, outlining its plan to gain compliance with the minimum Bid Price Requirement. On March 6, 2024, we received a letter from the Nasdaq Staff granting the Company a temporary exception until June 24, 2024, subject to certain milestones, to regain compliance with the Bid Price Requirement by evidencing a closing bid price of \$1.00 or more per share for a minimum of ten consecutive trading sessions. On June 7, 2024, as discussed in further detail below, the Company effected a reverse stock split to regain compliance with the Bid Price Requirement.

On June 24, 2024, we received a letter from the Nasdaq Staff indicating the Company was no longer in compliance with the MLVS of \$35 million required for listing on Nasdaq. The Company has 180 days, or until December 23, 2024, to regain compliance with the MVLS.

On July 3, 2024, we provided notice to Nasdaq regarding a possible violation of Nasdaq Listing Rule 5635(d)(2). The notification to Nasdaq related to the issuance of shares of our Common Stock upon conversion of convertible notes and upon exercise of warrants issued to an institutional investor (the "Investor") that may have required additional shareholder approval prior to the issuance of such securities.

The issuance of the convertible notes in aggregate amount of \$9.8 million in four tranches and the warrants equal to 25% of the conversion amount of the notes pursuant to a Securities Purchase Agreement entered into on March 15, 2023, with the Investor (the "Securities Purchase Agreement") was approved at our 2023 Annual Meeting of Stockholders held on June 28, 2023. On August 7, 2023, after completing the initial two tranches for \$5.4 million in convertible notes, we and the Investor entered into a First Amendment to the Securities Purchase Agreement, pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes in four closings at a conversion price of \$0.20. In addition, on August 7, 2023, we and the Investor also agreed to issue 4,765,620 (190,624 post reverse stock split) additional warrants at an exercise price of \$0.20 (\$5.00 post reverse stock split) (the "Additional Warrants") and provided that the conversion price of the remaining convertible notes outstanding from the first two tranches be reset to \$0.20 (\$5.00 post reverse stock split). On December 11, 2023, we and the Investor entered into a Second Amendment to the Securities Purchase Agreement pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes. 1,055,416 Additional Warrants (42,216 post reverse stock split) were issued in connection with the Second Amendment.

We have requested that Nasdaq determine whether the issuance of and adjustment to the conversion price of certain of the convertible notes to \$0.20, which was less than the floor price agreed to in the initial Securities Purchase Agreement, and the issuance of the Additional Warrants violated Nasdaq Listing Rule 5635(d)(2).

Although Nasdaq has not yet responded to our request as of August 19, 2024, Nasdaq may require us to take remedial action with respect to such potential noncompliance, including, but not limited to, obtaining shareholder ratification of the transactions described above. If we are unable to satisfy any such remedial requirements in a timely manner or at all, our securities may be subject to delisting from Nasdaq.

We are a "smaller reporting company" and an "emerging growth company" as defined under the federal securities laws and, as such, have elected to comply with certain reduced reporting requirements for this prospectus and may elect to do so in future filings.

**Investing in our Common Stock involves a high degree of risk. See "Risk Factors" beginning on page S-5 of this prospectus supplement, page 3 of the accompanying base prospectus and under similar headings in the documents incorporated by reference into this prospectus supplement and the accompanying base prospectus for a discussion of information that you should consider before investing in our Common Stock.**

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement or the accompanying base prospectus is truthful or complete. Any representation to the contrary is a criminal offense.**

---

**H.C. Wainwright & Co.**  
The date of this prospectus supplement is August 20, 2024.

---

---

## **TABLE OF CONTENTS**

### **Prospectus Supplement**

	<b><u>Page</u></b>
<a href="#"><u>ABOUT THIS PROSPECTUS SUPPLEMENT</u></a>	S-iii
<a href="#"><u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u></a>	S-iv
<a href="#"><u>PROSPECTUS SUPPLEMENT SUMMARY</u></a>	S-1
<a href="#"><u>THE OFFERING</u></a>	S-4
<a href="#"><u>RISK FACTORS</u></a>	S-5
<a href="#"><u>USE OF PROCEEDS</u></a>	S-9
<a href="#"><u>DILUTION</u></a>	S-10
<a href="#"><u>PLAN OF DISTRIBUTION</u></a>	S-11
<a href="#"><u>LEGAL MATTERS</u></a>	S-12
<a href="#"><u>EXPERTS</u></a>	S-12
<a href="#"><u>WHERE YOU CAN FIND MORE INFORMATION</u></a>	S-12
<a href="#"><u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u></a>	S-13

## Prospectus

	<u>Page</u>
<a href="#"><u>ABOUT THIS PROSPECTUS</u></a>	ii
<a href="#"><u>PROSPECTUS SUMMARY</u></a>	1
<a href="#"><u>RISK FACTORS</u></a>	3
<a href="#"><u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u></a>	4
<a href="#"><u>USE OF PROCEEDS</u></a>	5
<a href="#"><u>DESCRIPTION OF COMMON STOCK</u></a>	5
<a href="#"><u>DESCRIPTION OF PREFERRED STOCK</u></a>	6
<a href="#"><u>DESCRIPTION OF WARRANTS</u></a>	7
<a href="#"><u>DESCRIPTION OF DEBT SECURITIES</u></a>	9
<a href="#"><u>DESCRIPTION OF RIGHTS</u></a>	13
<a href="#"><u>DESCRIPTION OF UNITS</u></a>	14
<a href="#"><u>PLAN OF DISTRIBUTION</u></a>	14
<a href="#"><u>LEGAL MATTERS</u></a>	16
<a href="#"><u>EXPERTS</u></a>	16
<a href="#"><u>WHERE YOU CAN FIND MORE INFORMATION</u></a>	16
<a href="#"><u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u></a>	17

## ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus are part of a “shelf” registration statement on Form S-3 (File No. 333-275968) that we filed with the Securities and Exchange Commission, or the SEC, on December 8, 2023, and that was declared effective on December 22, 2023.

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of this offering and certain other matters. The second part, the accompanying base prospectus, provides more general information about us and our Common Stock. Generally, when we refer to the prospectus, we are referring to both parts of this document combined. To the extent information in this prospectus supplement conflicts with information in the accompanying base prospectus, you should rely on the information in this prospectus supplement. You should rely only on the information contained in, or incorporated by reference into, this prospectus supplement and the accompanying base prospectus and any related “free writing prospectus.” None of the Company or the Sales Agent has authorized anyone to provide information different from that contained in, incorporated or deemed incorporated by reference into this prospectus supplement or the accompanying base prospectus.

We note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference herein were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreement, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

Before you invest, you should read the registration statement of which this document forms a part, this document, the accompanying base prospectus and the documents incorporated by reference herein that are described under the headings “Where You Can Find More Information” and “Incorporation Of Certain Information By Reference.”

The information in this document may only be accurate on the date of the document. You should assume that the information appearing in this prospectus supplement is accurate only as of the date on the front cover of this prospectus supplement. Our business, financial condition, results of operations and prospects may have changed since that date.

We are not making an offer of these securities in any jurisdiction where the offer is not permitted.

This prospectus supplement relates only to an offering of up to \$25 million of our Common Stock through Wainwright. These sales, if any, will be made pursuant to the terms of the Offering Agreement entered into between us and Wainwright on August 20, 2024, a copy of which is incorporated by reference into this prospectus supplement. This prospectus supplement contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus supplement is a part, and you may obtain copies of those documents as described below under the heading “Where You Can Find More Information.”

Unless otherwise expressly indicated or the context otherwise requires, we use the terms “SeaStar Medical Holding Corporation,” “Company,” “we,” “us” and “our” or similar references to refer to SeaStar Medical Holding Corporation.

## CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement and the accompanying base prospectus, including the documents incorporated by reference herein and therein, contain forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act of 1934, as amended (the “Exchange Act”). These statements are based on our management’s current beliefs, expectations and assumptions about future events, conditions and results and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the sections titled “Business,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” incorporated by reference from our most recent Annual Report on Form 10-K and our subsequent Quarterly Reports on Form 10-Q filed with the SEC, as well as any amendments thereto reflected in subsequent filings with the SEC.

Any statements in this prospectus supplement and the accompanying base prospectus, or incorporated by reference herein or therein about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and are forward-looking statements. Within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act, these forward-looking statements may include, but are not limited to, statements regarding:

- the Company’s future capital requirements and sources and uses of cash;
- the Company’s ability to obtain funding or raise capital for its operations and future growth;
- any delays or challenges in obtaining FDA approval of the Company’s SCD product candidates;
- economic downturns and the possibility of rapid change in the highly competitive industry in which the Company operates;
- the ability to develop and commercialize its products or services following regulatory approval of the Company’s product candidates;
- the failure of third-party suppliers and manufacturers to fully and timely meet their obligations;
- product liability or regulatory lawsuits or proceedings relating to the Company’s products and services;
- inability to secure or protect its intellectual property;
- dispute or deterioration of relationships with the Company’s major partners and collaborators;
- the ability to maintain the listing of the Company’s Common Stock on Nasdaq;
- the ability to recognize the anticipated benefits of the Business Combination, which may be affected by, among other things, competition, and the ability of the Company to grow and manage growth profitably; and
- other risks and uncertainties indicated in this prospectus supplement, including those under “Risk Factors” herein, and other filings that have been made or will be made with the SEC.

In some cases, you can identify forward-looking statements by terminology such as “anticipate,” “believe,” “continue,” “could,” “estimate,” “expects,” “intend,” “may,” “might,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative or plural of those terms, and similar expressions intended to identify statements about the future, although not all forward-looking statements contain these words. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus supplement, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

You should refer to the risks and uncertainties described in the sections titled “Risk Factors” in this prospectus supplement, and under similar headings in the other documents that are incorporated by reference into this prospectus supplement, for a discussion of important factors that may cause our actual results to differ materially from those expressed or implied by our forward-looking statements. Given these risks, uncertainties and other factors, many of which are beyond our control, we cannot assure you that the forward-looking statements in this prospectus supplement will prove to be accurate, and you should not place undue reliance on these forward-looking statements. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified time frame, or at all.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus supplement, even if new information becomes available in the future.

## PROSPECTUS SUPPLEMENT SUMMARY

*The following summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus supplement. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. For a more complete understanding of our company and this offering, you should read and consider carefully the more detailed information included or incorporated by reference into this prospectus supplement, including the factors described under the heading “Risk Factors.”*

### **Business Summary**

#### **Company Overview**

We are a commercial stage medical technology company developing a proprietary platform therapy, our Selective Cytopheretic Device (“SCD”), to reduce the consequences of hyperinflammation on vital organs. We received Food and Drug Administration (the “FDA”) approval for our pediatric SCD on February 22, 2024, under a Humanitarian Device Exemption, and shipped our first commercial product in July 2024.

The inflammatory response is critical to fend off infections and repair damaged tissue in the body. Central to inflammation are the cells within blood and lymph circulatory systems, called white blood cells (primarily neutrophils and monocytes), also referred to commonly as “pus” cells.

In a normal inflammatory response, neutrophils are the first immune cells to arrive at the site and are key to the entire immune response that kills pathogens and promotes tissue repair. These inflammatory cells release chemicals (cytokines) that trigger the immune system to eliminate the foreign pathogens or damaged tissue, enhancing the immune response.

If the inflammatory response becomes excessive and dysregulated (referred as proinflammatory), normal neutrophil cells die off (“apoptosis”), allowing the inflammatory cells to continue to produce cytokines, further enhancing the dysregulated immune response, and altering feedback mechanisms that regulate the immune system. This results in damaging hyperinflammation spreading uncontrollably to other parts of the body, often leading to acute chronic solid organ dysfunction or failure, including heart, lung, kidney and liver diseases. This hyperinflammatory response is also known as the “cytokine storm,” referring to the body’s reaction to the category of small-secreted proteins released by hyperinflammatory cells that affect communication between cells. The cytokine storm, when left uncontrolled, can lead to organ damage and even death.

Based on clinical and preclinical studies conducted over the last 15 years, the Company’s technology has shown promise in modulating the degree of activity of proinflammatory cells to help reduce tissue damage and speed the repair and recovery of organ function. We believe this approach, if successful, will transform the ability of clinicians to treat acute organ failure in the intensive care unit (“ICU”) and to improve organ function in hospitalized patients.

Currently, few therapeutics are available to clinicians to address hyperinflammation and for those options that do exist, such options are either immunosuppressive or only target one cytokine. We believe our technology has the potential to overcome limitations in existing anti-inflammatory treatments and address the challenge of selectively targeting activated neutrophils and monocytes.

We are leveraging our patent protected and scalable SCD technology platform to develop proprietary therapies that are organ agnostic and target both acute and chronic indications. Preclinically, our SCD was tested in various animal models, which include acute myocardial infarction, intracranial hemorrhage, chronic heart failure, sepsis, and acute respiratory distress syndrome. The animal models demonstrated the inflammatory response and how it was modified by our SCD. We will continue to explore the application of our SCD technology across a broad range of markets and indications where proinflammatory activated neutrophils and monocytes may contribute to disease progression or severity in both acute and chronic indications.

We are using our SCD to clinically validate several acute and chronic organ injury indications, which include kidneys, heart, liver, brain and lungs. Our investigational SCD for adults is an extracorporeal synthetic membrane device that is currently being evaluated in a pivotal clinical trial in the US for pre-market clearance by the FDA. The SCD for adults is designed to be easily integrated into existing continuous renal replacement therapy (“CRRT”) systems that are commonly installed in hospitals, including in ICUs throughout the United States. Similar to our pediatric SCD, once approved and commercialized, our adult SCD is expected to initially target acute kidney injury in adults on CRRT. In addition, we are developing our SCD to address inflammation associated with liver disease, chronic dialysis and chronic heart failure in adult populations.

On October 28, 2022, we completed a business combination with LMAO, pursuant to that certain Agreement and Plan of Merger, dated as of April 21, 2022 (the “Merger Agreement”), by and among LMAO, LMF Merger Sub, Inc., a Delaware corporation and direct wholly owned subsidiary of LMAO (“Merger Sub”), and SeaStar Medical, Inc., a Delaware corporation (“SeaStar Medical, Inc.”). As contemplated by the Merger Agreement, SeaStar Medical, Inc. merged with and into Merger Sub,

with SeaStar Medical, Inc. continuing as the surviving entity in the merger as a wholly owned subsidiary of LMAO (the “Business Combination”). In connection with the closing of the Business Combination, LMAO changed its name to “SeaStar Medical Holding Corporation.”

### ***Corporate Information***

Our principal executive offices are located at 3513 Brighton Boulevard, Suite #410, Denver, Colorado 80216, and our phone number is 844-427-8100.

### ***Implications of Being a Smaller Reporting Company***

We are a “smaller reporting company” meaning that the market value of our Common Stock held by non-affiliates is less than \$250.0 million measured on the last business day of our most recent second fiscal quarter or our annual revenue is less than \$100.0 million during the most recent completed fiscal year and the market value of our Common Stock held by non-affiliates is less than \$700.0 million measured on the last business day of our most recent second fiscal quarter. Accordingly, we may provide less public disclosure than larger public companies, including the inclusion of only two years of audited financial statements and only two years of management’s discussion and analysis of financial condition and results of operations disclosure. As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

### ***Recent Developments***

#### ***Company Update***

The Company obtained a Humanitarian Device Exemption (“HDE”) regulatory approval to commercialize and sell its pediatric SCD product on February 22, 2024. Since the approval date, the FDA has notified the Company that certain label insert changes were required prior to a first commercial sale. Such label changes have been made and agreed to by the FDA on June 28, 2024. In July 2024, the Company successfully shipped its first commercial product. Under the HDE, the SCD product may be administered only in facilities that have oversight from an Institutional Review Board designated to review and monitor use of innovative medical device technologies.

#### ***Nasdaq Listing***

On June 14, 2023, we received a letter from the Nasdaq Staff notifying us that the market value of listed securities of our Common Stock had been below the \$35,000,000 minimum requirement (the “MVLS Requirement”).

The letter also stated that we would be provided 180 calendar days, or until December 11, 2023, to regain compliance with the MVLS Requirement. On December 13, 2023, we received a notification from the Listing Qualification Department of Nasdaq that we had not regain compliance with the MVLS Requirement and that our Common Stock would be subject to delisting unless we timely request a hearing before a Panel. On December 19, 2023, we submitted a hearing request to the Panel to appeal the delisting determination. On the same date, we received a notice from Nasdaq stating that its delisting action had been stayed pending a final written decision by the Panel and that a hearing would be held on March 12, 2024. On February 6, 2024, we received notification from Nasdaq that we had regained compliance with the MVLS Requirement.

On June 26, 2023, we received a letter from the Listing Qualifications Department of Nasdaq notifying us that the Company was not in compliance with the \$1.00 per share minimum bid price requirement (the “Bid Price Requirement”) for continued inclusion on Nasdaq pursuant to Nasdaq Listing Rule 5550(a)(2).

This letter had no immediate effect on the listing of the Company’s Common Stock on Nasdaq and the Company had 180 calendar days from the date of the notice, or until December 26, 2023, to regain compliance with the Bid Price Requirement. On December 27, 2023, we received notification from Nasdaq that the Company had not regained compliance with the Bid Price Requirement and that the Panel would consider this matter in rendering a determination regarding the Company’s continued listing on Nasdaq.

On February 21, 2024, the Company made a pre-hearing submission to Nasdaq, outlining its plan to gain compliance with the minimum Bid Price Requirement. On March 6, 2024, we received a letter from the Nasdaq Staff granting the Company a temporary exception until June 24, 2024, subject to certain milestones, to regain compliance with the Bid Price Requirement by evidencing a closing bid price of \$1.00 or more per share for a minimum of ten consecutive trading sessions. On June 7, 2024, as discussed in further detail below, the Company effected a reverse stock split to regain compliance with the Bid Price Requirement. On June 27, 2024, we received a letter from the Nasdaq Staff indicating the Company regained compliance with the minimum Bid Price Requirement for listing on Nasdaq.

On June 24, 2024, we received a letter from the Nasdaq Staff indicating the Company was no longer in compliance with the MVLS Requirement of \$35 million required for listing on Nasdaq. The Company has 180 days, or until December 23, 2024, to regain compliance with the MVLS Requirement.

On July 3, 2024, we provided notice to Nasdaq regarding a possible violation of Nasdaq Listing Rule 5635(d)(2). The notification to Nasdaq related to the issuance of shares of our Common Stock upon conversion of convertible notes and upon exercise of warrants issued to an institutional investor (the "Investor") that may have required additional shareholder approval prior to the issuance of such securities.

The issuance of the convertible notes in aggregate amount of \$9.8 million in four tranches and the warrants equal to 25% of the conversion amount of the notes pursuant to a Securities Purchase Agreement entered into on March 15, 2023, with the Investor (the "Securities Purchase Agreement") was approved at our 2023 Annual Meeting of Stockholders held on June 28, 2023. On August 7, 2023, after completing the initial two tranches for \$5.4 million in convertible notes, we and the Investor entered into a First Amendment to the Securities Purchase Agreement, pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes in four closings at a conversion price of \$0.20. In addition, on August 7, 2023, we and the Investor also agreed to issue 4,765,620 (190,624 post reverse stock split) additional warrants at an exercise price of \$0.20 (\$5.00 post reverse stock split) (the "Additional Warrants") and provided that the conversion price of the remaining convertible notes outstanding from the first two tranches be reset to \$0.20 (\$5.00 post reverse stock split). On December 11, 2023, we and the Investor entered into a Second Amendment to the Securities Purchase Agreement pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes. 1,055,416 Additional Warrants (42,216 post reverse stock split) were issued in connection with the Second Amendment.

We have requested that Nasdaq determine whether the issuance of and adjustment to the conversion price of certain of the convertible notes to \$0.20, which was less than the floor price agreed to in the initial Securities Purchase Agreement, and the issuance of the Additional Warrants violated Nasdaq Listing Rule 5635(d)(2).

Although Nasdaq has not yet responded to our request as of August 19, 2024, Nasdaq may require us to take remedial action with respect to such potential noncompliance, including, but not limited to, obtaining shareholder ratification of the transactions described above. If we are unable to satisfy any such remedial requirements in a timely manner or at all, our securities may be subject to delisting from Nasdaq.

### ***Reverse Stock Split***

On June 5, 2024, our Board of Directors approved a 1-for-25 reverse stock split of the Common Stock. The Company's stockholders duly approved the Reverse Split at a Special Meeting of Stockholders on September 6, 2023. The Reverse Split was effective as of 5:00 p.m. Eastern Standard Time on June 7, 2024, and the Company's shares of Common Stock began trading on a split-adjusted basis on Nasdaq on June 10, 2024 under the same symbol "ICU". All stock options and warrants of the Company outstanding, except the Unadjusted Warrants, immediately prior to the Reverse Split were proportionally adjusted. While the number of Listed Warrants actively traded under the symbol ICUCW remains at 10,550,000, holders of Listed Warrants will be required to exercise 25 warrants for an aggregate exercise price of \$287.50 to purchase one share of Common Stock.

As a result of the Reverse Split, every 25 shares of the Company's issued and outstanding Common Stock was automatically combined and converted into one issued and outstanding share of Common Stock, par value \$0.0001 per share reducing our outstanding shares of Common Stock from 77,740,887 shares outstanding, to 3,109,671 shares as of the effective date. The Company did not issue any fractional shares in connection with the Reverse Split. Instead, the number of shares were rounded up to the next whole number. The Reverse Split did not modify the rights or preferences of the Common Stock.

## THE OFFERING

<b>Common Stock offered by us</b>	Shares of our Common Stock having an aggregate offering price of up to \$25 million.
<b>Common Stock outstanding after this offering</b>	Up to 3,840,245 shares, based on \$25 million available under this prospectus supplement and assuming sales at a price of \$6.51 per share, which was the closing price of our Common Stock on Nasdaq on August 16, 2024. The actual number of shares issued will vary depending on the sales price under this offering.
<b>Plan of Distribution</b>	“At the market offering” that may be made from time to time through our sales agent, Wainwright. See “Plan of Distribution” on page S-11 of this prospectus supplement.
<b>Use of Proceeds</b>	We currently intend to use the net proceeds from this offering primarily for general corporate purposes. See “Use of Proceeds” on page S-9 of this prospectus supplement.
<b>Risk Factors</b>	Investing in our securities involves a high degree of risk. You should consider carefully all the information included or incorporated by reference into this prospectus supplement and the section titled “Risk Factors” beginning on page S-5 of this prospectus supplement, the “Risk Factors” section beginning on page 3 of the accompanying base prospectus, the “Risk Factors” section beginning on page 30 of our Annual Report on Form 10-K for the year ended December 31, 2023, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying base prospectus before deciding whether to purchase our Common Stock in this offering.
<b>Nasdaq symbol</b>	Our Common Stock and Listed Warrants are listed for trading on Nasdaq under the symbols “ICU” and “ICUCW,” respectively.

The number of shares of Common Stock to be outstanding after this offering as reflected in the table above is based on the actual number of shares outstanding as of August 18, 2024, which was 4,191,783 shares and does not include (vested and unvested):

- 21,931 shares of Common Stock issuable upon the exercise of stock options, with a weighted-average exercise price of \$45.32 per share;
- 39,677 shares of Common Stock issuable upon the settlement of outstanding restricted stock units;
- 2,359,829 shares of Common Stock issuable upon the exercise of outstanding warrants, with a weighted-average exercise price of \$92.88 per share; and
- 269,218 additional shares of Common Stock reserved for future issuance under our 2022 Omnibus Equity Incentive Plan.

Except as otherwise indicated, all information in this prospectus supplement assumes no exercise of outstanding options and warrants.

## RISK FACTORS

*Investing in our securities involves a high degree of risk. In addition to other information contained in this prospectus supplement and in the accompanying prospectus, before investing in our securities, you should carefully consider the risks described under the heading “Risk Factors” in our most recent Annual Report on Form 10-K and Quarterly Reports on Form 10-Q and any subsequent Quarterly Reports on Form 10-Q or Current Reports on Form 8-K and in any other documents incorporated by reference into this prospectus supplement, as updated by our future filings. These risks are not the only ones faced by us. Additional risks not known or that are deemed immaterial could also materially and adversely affect our financial condition, results of operations, our products, business and prospects. Any of these risks might cause you to lose all or a part of your investment.*

### **Risks Related to this Offering**

*The market valuation of our business may fluctuate due to factors beyond our control and the value of the investment of our stockholders may fluctuate correspondingly.*

Our market valuation may fluctuate significantly in response to a number of factors, many of which are beyond our control, including:

- market acceptance and commercialization of our products;
- our being able to timely demonstrate achievement of milestones, including those related to revenue generation, cost control, cost effective source supply and regulatory approvals;
- regulatory developments or enforcements in the United States and non-U.S. countries with respect to our products or our competitors’ products;
- failure to achieve pricing acceptable to the market;
- actual or anticipated fluctuations in our financial condition and operating results, or our continuing to sustain operating losses;
- competition from existing products or new products that may emerge;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- issuance of new or updated research or reports by securities analysts;
- announcement or expectation of additional financing efforts, particularly if our cash available for operations significantly decreases;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- additions or departures of key management personnel;
- disputes or other developments related to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- entry by us into any material litigation or other proceedings;
- sales of our Common Stock by us, our insiders, or our other stockholders;
- market conditions for stocks in general; and
- general economic and market conditions unrelated to our performance.

***Since we have broad discretion in how we use the net proceeds from this offering, we may use the net proceeds in ways with which you disagree.***

We have not allocated specific amounts of the net proceeds from this offering for any specific purpose. Accordingly, our management will have some flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the net proceeds are being used appropriately. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for us. The failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flow.

***The actual number of shares we will issue under the Offering Agreement, at any time or in total, is uncertain.***

Subject to certain limitations in the Offering Agreement and compliance with applicable law, we have the discretion to deliver a placement notice to Wainwright at any time and from time to time during the term of the Offering Agreement, as discussed in the “Plan of Distribution” below. The actual number of shares of Common Stock that are sold to or through Wainwright on our behalf pursuant to any placement notice we deliver to Wainwright will depend on the market price of the Common Stock during the periods in which sales are made and any restrictions or limitations applicable to such sales, such as a minimum price below which sales may not be made, that we may include in such placement notice or that otherwise apply under the Offering Agreement. Because the price per share of each share of Common Stock sold will fluctuate based on the market price of our Common Stock during the sales period, it is not possible at this stage to predict the number of shares that will ultimately be issued.

***You may experience immediate dilution in the book value per share of the Common Stock you purchase.***

The price per share in this offering may exceed the net tangible book value per share of our Common Stock outstanding prior to this offering. Assuming that an aggregate of 3,840,245 shares of our Common Stock are sold at a price of \$6.51 per share, the last reported sale price of our Common Stock on Nasdaq on August 16, 2024, for aggregate gross proceeds of \$25,000,000 (the amount available under this prospectus supplement), and after deducting estimated offering commissions and estimated offering expenses payable by us, you will experience immediate dilution of \$5.24 per share, representing the difference between our as adjusted net tangible book value per share as of June 30, 2024 after giving effect to this offering at the assumed offering price. The exercise of outstanding stock options and the vesting of outstanding restricted stock units will result in further dilution of your investment. See “Dilution” on page S-10 for a more detailed discussion of the dilution you will incur in connection with this offering.

***You may experience future dilution as a result of future equity offerings.***

In order to raise additional capital, we may at any time, including during the pendency of this offering, offer additional shares of our Common Stock or other securities convertible into or exchangeable for our Common Stock at prices that may not be the same as the price per share in this offering. We may sell shares or other securities in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our Common Stock, or securities convertible or exchangeable into Common Stock, in future transactions may be higher or lower than the price per share paid by investors in this offering.

***A large number of shares may be sold in the market following this offering, which may depress the market price of our Common Stock.***

All of our shares of Common Stock sold in the offering will be freely tradable without restriction or further registration under the Securities Act. As a result, a substantial number of our shares of Common Stock may be sold in the public market following this offering, which may cause the market price of our Common Stock to decline. If there are more shares of Common Stock offered for sale than buyers are willing to purchase, then the market price of our Common Stock may decline to a market price at which buyers are willing to purchase the offered shares of Common Stock and sellers remain willing to sell the shares of Common Stock.

We cannot predict the effect, if any, that future issuances or sales of our securities, including sales of our Common Stock pursuant to the Offering Agreement or the availability of our securities for future issuance or sale, will have on the market price of our Common Stock. Issuances or sales of substantial amounts of our securities including sales of our Common Stock pursuant to the Offering Agreement, or the perception that such issuances or sales might occur, could negatively impact the market price of our Common Stock and the terms upon which we may obtain additional equity financing in the future.

## Risks Related to our Company

***Our Common Stock may be delisted from Nasdaq if we do not maintain compliance with Nasdaq's continued listing requirements. If our Common Stock is delisted, it could negatively impact the Company.***

Continued listing of a security on Nasdaq is conditioned upon compliance with various continued listing standards. There can be no assurance that we will be able to comply with the applicable listing standards.

On June 14, 2023, we received a letter from the Nasdaq Staff notifying us that the market value of listed securities ("MVLS") of our Common Stock had been below the minimum \$35,000,000 MVLS Requirement.

The letter also stated that we would be provided 180 calendar days, or until December 11, 2023, to regain compliance with the MVLS Requirement. On December 13, 2023, we received a notification from the Listing Qualification Department of Nasdaq that we had not regain compliance with the MVLS Requirement and that our Common Stock would be subject to delisting unless we timely request a hearing before a Panel. On December 19, 2023, we submitted a hearing request to the Panel to appeal the delisting determination. On the same date, we received a notice from Nasdaq stating that its delisting action had been stayed pending a final written decision by the Panel and that a hearing would be held on March 12, 2024. On February 6, 2024, we received notification from Nasdaq that we had regained compliance with the MVLS Requirement.

On June 26, 2023, we received a letter from the Listing Qualifications Department of Nasdaq notifying us that the Company was not in compliance with the \$1.00 per share minimum Bid Price Requirement for continued inclusion on the Nasdaq Capital Market pursuant to Nasdaq Listing Rule 5550(a)(2).

This letter had no immediate effect on the listing of the Company's Common Stock on Nasdaq and the Company had 180 calendar days from the date of the notice, or until December 26, 2023, to regain compliance with the Bid Price Requirement. On December 27, 2023, we received notification from Nasdaq that the Company had not regained compliance with the Bid Price Requirement and that the Panel would consider this matter in rendering a determination regarding the Company's continued listing on The Nasdaq Capital Market. Pursuant to Listing Rule 5810(d), the Company should present its views with respect to this deficiency at its Panel hearing to be held on March 12, 2024. If we failed to address the aforementioned issue, the Panel would consider the record as presented at the hearing and would make its determination based upon that information.

On February 21, 2024, the Company made a pre-hearing submission to Nasdaq, outlining its plan to gain compliance with the minimum Bid Price Requirement. On March 6, 2024, we received a letter from the Nasdaq Staff granting the Company a temporary exception until June 24, 2024, subject to certain milestones, to regain compliance with the Bid Price Requirement by evidencing a closing bid price of \$1.00 or more per share for a minimum of ten consecutive trading sessions. On June 7, 2024, the Company effected a reverse stock split to regain compliance with the Bid Price Requirement. On June 27, 2024, we received a letter from the Nasdaq Staff indicating the Company regained compliance with the minimum Bid Price Requirement for listing on Nasdaq.

On June 24, 2024, we received a letter from the Nasdaq Staff indicating the Company was no longer in compliance with the MLVS of \$35 million required for listing on Nasdaq. The Company has 180 days, or until December 23, 2024, to regain compliance with the MVLS.

On July 3, 2024, we provided notice to Nasdaq regarding a possible violation of Nasdaq Listing Rule 5635(d)(2). The notification to Nasdaq related to the issuance of shares of our Common Stock upon conversion of convertible notes and upon exercise of warrants issued to an institutional investor (the "Investor") that may have required additional shareholder approval prior to the issuance of such securities.

The issuance of the convertible notes in aggregate amount of \$9.8 million in four tranches and the warrants equal to 25% of the conversion amount of the notes pursuant to a Securities Purchase Agreement entered into on March 15, 2023, with the Investor (the "Securities Purchase Agreement") was approved at our 2023 Annual Meeting of Stockholders held on June 28, 2023. On August 7, 2023, after completing the initial two tranches for \$5.4 million in convertible notes, we and the Investor entered into a First Amendment to the Securities Purchase Agreement, pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes in four closings at a conversion price of \$0.20. In addition, on August 7, 2023, we and the Investor also agreed to issue 4,765,620 (190,624 post reverse stock split) additional warrants at an exercise price of \$0.20 (\$5.00 post reverse stock split) (the "Additional Warrants") and provided that the conversion price of the remaining convertible notes outstanding from the first two tranches be reset to \$0.20 (\$5.00 post reverse stock split). On December 11, 2023, we and the Investor entered into a Second Amendment to the Securities Purchase Agreement pursuant to which the Investor agreed to purchase an aggregate of \$2.2 million of additional convertible notes. 1,055,416 Additional Warrants (42,216 post reverse stock split) were issued in connection with the Second Amendment.

We have requested that Nasdaq determine whether the issuance of and adjustment to the conversion price of certain of the convertible notes to \$0.20, which was less than the floor price agreed to in the initial Securities Purchase Agreement, and the issuance of the Additional Warrants violated Nasdaq Listing Rule 5635(d)(2).

Although Nasdaq has not yet responded to our request as of August 19, 2024, Nasdaq may require us to take remedial action with respect to such potential noncompliance, including, but not limited to, obtaining shareholder ratification of the transactions described above. If we are unable to satisfy any such remedial requirements in a timely manner or at all, our securities may be subject to delisting from Nasdaq.

If the Company's Common Stock ultimately were to be delisted for any reason, it could negatively impact the Company by (i) reducing the liquidity and market price of the Company's Common Stock; (ii) reducing the number of investors willing to hold or acquire the Company's Common Stock, which could negatively impact the Company's ability to raise equity financing; (iii) limiting the Company's ability to use a registration statement to offer and sell freely tradable securities, thereby preventing the Company from accessing the public capital markets; and (iv) impairing the Company's ability to provide equity incentives to its employees.

***We may become a defendant in one or more stockholder derivative, class-action, and other litigation, and any such lawsuits may adversely affect our business, financial condition, results of operations and cash flows.***

We may in the future become defendants in one or more stockholder derivative actions or other class-action lawsuits. For example, certain former directors of the Company have threatened litigation for purported harm to the Company in connection with certain allegations made by the former directors against other members of our Board of Directors and management of the Company. The former directors have also made demands in connection with certain alleged contractual rights and purported agreements with the Company. The Company and the Board of Directors dispute these allegations and believe they are unfounded.

In addition, on July 5, 2024, Forrest A K Wells (the "Plaintiff"), a purported stockholder of the Company, filed a putative class action complaint in the United States District Court for the State of Colorado (the "Class Action"), alleging that the Company and its management members made material misstatements or omissions regarding the Company's business and operations, including disclosures relating to FDA approval of product candidates of the Company, allegedly culminating in the restatement of the Company's consolidated financial statements as disclosed in the Form 8-K filed on March 27, 2024. The Class Action asserts claims under Section 10(b) of the Exchange Act against the Company, its Chief Executive Officer and former Chief Financial Officer (collectively, the Defendants"), as well as claims under Section 20(a) of the Exchange Act against the Defendants. Among other remedies, the Class Action seeks to recover compensatory and other damages. The Company intends to vigorously defend the action.

Any such lawsuit could divert our management's attention and resources from our ordinary business operations, and we would likely incur significant expenses associated with their defense (including, without limitation, substantial attorneys' fees and other fees of professional advisors and potential obligations to indemnify current and former officers and directors who are or may become parties to such actions). In connection with these lawsuits, we may be required to pay material damages, consent to injunctions on future conduct and/or suffer other penalties, remedies or sanctions, or issue additional shares upon the exercise of certain warrants, which may cause additional dilution. In addition, any such future lawsuits could adversely impact our reputation and/or ability to launch and commercialize our products, thereby harming our ability to generate revenue. Accordingly, the ultimate resolution of these matters and any future matters could have a material adverse effect on our business, financial condition, results of operation and cash flow and, consequently, could negatively impact the trading price of our common stock.

***The Company outsources many of its operational and development activities to maintain the ability to scale operations as needed and therefore relies on the capabilities of its partners for which it may not have full control.***

The Company relies on third-party consultants, vendors and distributors to manage and implement much of the day-to-day responsibilities of conducting clinical trials and manufacturing and distribution of its current products and product candidates. Accordingly, the Company is and will continue to be dependent on the timeliness and effectiveness of the efforts of these third parties. The Company's dependence on third parties includes key suppliers and third-party service providers supporting the development, manufacturing, distribution and regulatory approval of its SCD, as well as support for its information technology systems and other infrastructure. While its management team oversees these vendors, the failure of any of these third parties to meet their contractual, regulatory, and other obligations, or the development of factors that materially disrupt the performance of these third parties, could have a material adverse effect on the Company's business, results of operations and financial condition.

For example, in December 2022, we entered into a license and distribution agreement (the "Distribution Agreement") with Nuwellis, Inc. ("Nuwellis"), pursuant to which we appointed Nuwellis as our exclusive distributor for the sale and distribution of our pediatric SCD product throughout the United States once we receive from the FDA a written authorization to market such product for pediatric use pursuant to our HDE application. In the event of a material breach if such breach is not cured within ninety (90) days after written notice, we have the right to terminate the Distribution Agreement in accordance with the terms set forth in the Distribution Agreement. In May 2024, the Company provided notice to Nuwellis that Nuwellis had breached the Distribution

Agreement. Nuwellis has disputed the breach, and the parties are engaged in negotiations to resolve the matter. Resolution of the matter may result in litigation or require changes to the Distribution Agreement or payments to Nuwellis.

## USE OF PROCEEDS

We may issue and sell shares of our Common Stock having aggregate gross proceeds of up to \$25 million from time to time. There can be no assurance that we will sell any shares under the Offering Agreement with Wainwright as a source of financing.

We intend to use the net proceeds from this offering for general corporate purposes. General corporate purposes may include additions to working capital and capital expenditures.

We will retain broad discretion over the use of the net proceeds from the sale of the securities offered hereby. Accordingly, we reserve the right to use these proceeds for different purposes or uses which we have not listed above. See “Risk Factors – Since we have broad discretion in how we use the net proceeds from this offering, we may use the net proceeds in ways with which you disagree.”

Until we use the net proceeds of this offering, we intend to invest the funds in investment grade, interest-bearing securities or hold such proceeds in deposit accounts.

## DILUTION

Net tangible book value per share is total tangible assets, reduced by total liabilities, divided by the total number of outstanding shares of Common Stock. Our net tangible book value as of June 30, 2024, was approximately (\$6.9) million, or approximately (\$1.65) per outstanding share of Common Stock.

After giving effect to the assumed sale of 3,840,245 shares of our Common Stock at a price of \$6.51 per share, the last reported sale price of our Common Stock on Nasdaq on August 16, 2024, for aggregate gross proceeds of \$25,000,000 (the amount available under this prospectus supplement), and after deducting estimated offering commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of June 30, 2024 would have been approximately \$22.3 million, or \$1.13 per share. This represents an immediate increase in net tangible book value of \$2.92 per share to existing stockholders and immediate dilution of \$5.24 per share to investors purchasing our Common Stock in this offering at the public offering price. The following table illustrates this calculation on a per share basis, assuming that we sell all of the securities we are offering:

Assumed public offering price per share		\$	6.51
Net tangible book value per share as of June 30, 2024		\$	(1.65)
Increase in net tangible book value per share after this offering		\$	<u>2.92</u>
As adjusted net tangible book value per share as of June 30, 2024, after this offering		\$	<u>1.27</u>
Dilution in as adjusted net tangible book value per share to new investors		\$	<u><u>5.24</u></u>

The table above assumes for illustrative purposes that an aggregate of 3,840,245 shares of our Common Stock are sold at a price of \$6.51 per share, the last reported sale price of our Common Stock on Nasdaq on August 16, 2024, for aggregate gross proceeds of \$25,000,000 (the amount available under this prospectus supplement). The shares subject to the Offering Agreement with Wainwright are being sold from time to time at various prices. An increase of \$1.00 per share in the price at which the shares are sold from the assumed offering price of \$6.51 per share shown in the table above, assuming all of our Common Stock in the aggregate amount of \$25,000,000 (the amount available under this prospectus supplement) during the term of the Offering Agreement with Wainwright is sold at that price, would increase our as adjusted net tangible book value per share after the offering to \$3.11 per share and would increase the dilution in net tangible book value per share to new investors in this offering to \$6.04 per share, after deducting estimated offering commissions and estimated aggregate offering expenses payable by us. A decrease of \$1.00 per share in the price at which the shares are sold from the assumed offering price of \$6.51 per share shown in the table above, assuming all of our Common Stock in the aggregate amount of \$25,000,000 (the amount available under this prospectus supplement) during the term of the Offering Agreement with Wainwright is sold at that price, would decrease our as adjusted net tangible book value per share after the offering to \$0.91 per share and would decrease the dilution in net tangible book value per share to new investors in this offering to \$4.60 per share, after deducting estimated offering commissions and estimated aggregate offering expenses payable by us. This information is supplied for illustrative purposes only and may differ based on the actual offering price and the actual number of shares offered.

The number of shares of Common Stock to be outstanding immediately after this offering is based on 3,221,104 shares of our Common Stock outstanding as of June 30, 2024 and excludes (in each case as of June 30, 2024):

- 970,679 shares of Common Stock issued subsequent to June 30, 2024;
- 21,931 shares of Common Stock issuable upon the exercise of stock options, with a weighted-average exercise price of \$45.32 per share;
- 36,977 shares of Common Stock issuable upon the settlement of outstanding restricted stock units;
- 1,471,940 shares of Common Stock issuable upon the exercise of outstanding warrants, with a weighted-average exercise price of \$142.19 per share;
- 269,218 additional shares of Common Stock reserved for future issuance under our 2022 Omnibus Equity Incentive Plan;
- Up to 28,252 shares of Common Stock to be issued to directors of the Company in lieu of cash fees due to the directors for their services.
- Up to 2,660 shares of Common Stock to be issued to the Chief Financial Officer, in lieu of cash due the Chief Financial Officer.

## PLAN OF DISTRIBUTION

We entered into the Offering Agreement with Wainwright on August 20, 2024, under which we may issue and sell shares of our Common Stock through or to Wainwright acting as sales agent or principal.

Upon delivery of a placement notice and subject to the terms and conditions of the Offering Agreement, Wainwright may offer and sell shares of our Common Stock by any method permitted by law deemed to be an “at-the-market” offering as defined in Rule 415 promulgated under the Securities Act, including sales made directly on or through Nasdaq, the existing trading market for our Common Stock, sales made to or through a market maker other than on an exchange or otherwise, directly to Wainwright as principal, in negotiated transactions at market prices prevailing at the time of sale or at prices related to such prevailing market prices, and/or in any other method permitted by law. We or Wainwright may suspend the offering of Common Stock upon notice and subject to other conditions.

We will pay Wainwright commissions, in cash, for its services in acting as agent in the sale of our Common Stock. Wainwright will be entitled to compensation at a commission rate of up to 3.0% of the gross sales price per share sold. Because there is no minimum offering amount required as a condition of this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. We have also agreed to reimburse Wainwright for fees and expenses of its legal counsel in an amount up to \$50,000, in addition to certain ongoing disbursements of its legal counsel payable in the amount of up to \$2,500 in connection with each diligence bring-down thereafter. We estimate that the total expenses for the offering, excluding compensation and reimbursements payable to Wainwright under the terms of the Offering Agreement, will be approximately \$75,000.

Settlement for sales of shares of Common Stock will occur on the first trading day following the date on which any sales are made, or on some other date that is agreed upon by us and Wainwright in connection with a particular transaction, in return for payment of the net proceeds to us. Sales of our Common Stock as contemplated in this prospectus supplement will be settled through the facilities of The Depository Trust Company or by such other means as we and Wainwright may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

Wainwright will use its best efforts, consistent with its sales and trading practices, to solicit offers to purchase the shares of Common Stock under the terms and subject to the conditions set forth in the Offering Agreement. In connection with the sale of the shares of Common Stock on our behalf, Wainwright will be deemed to be an “underwriter” within the meaning of the Securities Act and the compensation of Wainwright will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to Wainwright against certain civil liabilities, including liabilities under the Securities Act.

This offering of shares of our Common Stock pursuant to the Offering Agreement will terminate upon termination of the Offering Agreement as permitted therein. We and Wainwright may each terminate the Offering Agreement as provided therein.

From the date of this prospectus supplement until 12 months thereafter, we or any of our subsidiaries decides to raise funds by means of a public offering (including ATMs) or a private placement or any other capital-raising financing of equity or equity-linked securities, Wainwright (or any affiliate designated by Wainwright) shall have the right to act as sole book-running manager, sole underwriter or sole placement agent for such financing.

To the extent required by Regulation M, Wainwright will not engage in any market making activities involving our Common Stock while the offering is ongoing under this prospectus supplement. Wainwright and its affiliates may in the future provide various investment banking, commercial banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees.

This summary of the material provisions of the Offering Agreement does not purport to be a complete statement of its terms and conditions. A copy of the Offering Agreement is filed with the SEC and is incorporated by reference into the registration statement of which this prospectus supplement is a part. See “Where You Can Find More Information; Incorporation of Certain Information by Reference” below.

This prospectus supplement in electronic format may be made available on a website maintained by Wainwright, and Wainwright may distribute this prospectus supplement electronically.

## LEGAL MATTERS

Certain legal matters in connection with the offering and the validity of the securities offered by this prospectus supplement will be passed upon for us by Dorsey & Whitney LLP, Salt Lake City, Utah. The Sales Agent is being represented in connection with this offering by Lucosky Brookman LLP, Woodbridge, New Jersey.

## EXPERTS

The consolidated financial statements as of December 31, 2023 and for the year then ended incorporated by reference into this prospectus supplement have been so incorporated in reliance on the report of WithumSmith+Brown, PC, an independent registered public accounting firm, and given on the authority of said firm as experts in auditing and accounting. The report on the consolidated financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

The consolidated financial statements as of December 31, 2022 and for the year then ended incorporated by reference into this prospectus supplement have been so incorporated in reliance on the report of Armanino LLP, an independent registered public accounting firm, and given on the authority of said firm as experts in auditing and accounting. The report on the consolidated financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

## WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities we are offering under this prospectus supplement and the accompanying base prospectus. This prospectus supplement and the accompanying base prospectus do not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus supplement and the accompanying base prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, where our SEC filings are also available. The address of the SEC's website is <http://www.sec.gov>.

We maintain a website at [www.seastarmedical.com](http://www.seastarmedical.com). Information contained in or accessible through our website does not constitute a part of this prospectus supplement.

## INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus supplement and the accompanying prospectus the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement and the accompanying prospectus. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference into this document modifies or supersedes the statement. We incorporate by reference into this prospectus supplement and the accompanying prospectus the following information (other than, in each case, documents or information deemed to have been furnished and not filed in accordance with SEC rules):

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2023, filed with the SEC on April 16, 2024, and as amended on [Form 10-K/A](#), filed with the SEC on April 26, 2024;
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2024 and June 30, 2024, filed with the SEC on [May 15, 2024](#) and [August 13, 2024](#) respectively,
- our Current Reports on Form 8-K filed with the SEC on [January 11, 2024](#), [January 12, 2024](#), [January 24, 2024](#), [January 30, 2024](#), [February 9, 2024](#), [February 16, 2024](#), [February 22, 2024](#), [March 8, 2024](#), [March 27, 2024](#), [March 27, 2024](#), as amended on Form 8-K/A, filed with the SEC on [March 27, 2024](#), [April 18, 2024](#), [June 4, 2024](#), [June 7, 2024](#), [June 10, 2024](#), [June 11, 2024](#), [June 28, 2024](#), [July 2, 2024](#), [July 5, 2024](#), [July 9, 2024](#), and [July 11, 2024](#); and
- the description of our Common Stock which is registered under Section 12 of the Exchange Act, in our registration statement on [Form 8-A](#), filed on January 22, 2021, as updated by the description of our Common Stock contained in [Exhibit 4.5](#) to our Annual Report on Form 10-K/A filed with the SEC on July 3, 2024, including any amendments or reports filed for the purposes of updating this description.

We also incorporate by reference into this prospectus supplement all documents (other than Current Reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items) that are filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus supplement is a part and prior to effectiveness of such registration statement, as well as after the date of this prospectus supplement until we file a post-effective amendment that indicates the termination of the offering of the shares of our Common Stock made by this prospectus supplement and will become a part of this prospectus supplement from the date that such documents are filed with the SEC. These documents include periodic reports, such as Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, as well as proxy statements.

We will provide to each person, including any beneficial owner, to whom a prospectus supplement is delivered, without charge upon written or oral request, a copy of any or all of the documents that are incorporated by reference into this prospectus supplement but not delivered with this prospectus supplement, including exhibits which are specifically incorporated by reference into such documents. You should direct any requests for documents to SeaStar Medical Holding Corporation, 3513 Brighton Blvd., Suite 410, Denver, CO 80216; telephone: (844) 427-8100.

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference into this document modifies or supersedes the statement.

## PROSPECTUS



**\$100,000,000**

**Common Stock  
Preferred Stock  
Warrants  
Debt Securities  
Rights  
Units**

From time to time, we may offer and sell up to \$100,000,000 in aggregate of the securities described in this prospectus separately or together in any combination, in one or more classes or series, in amounts, at prices and on terms that we will determine at the time of the offering.

This prospectus provides a general description of the securities we may offer. We may provide specific terms of securities to be offered in one or more supplements to this prospectus. We may also provide a specific plan of distribution for any securities to be offered in a prospectus supplement. Prospectus supplements may also add, update or change information in this prospectus. You should carefully read this prospectus and the applicable prospectus supplement, together with any document incorporated by reference herein, before you invest in our securities. The applicable prospectus supplement will contain information, where applicable, as to the listing of any other securities covered by the prospectus supplement other than our common stock, par value \$0.0001 per share (the "Common Stock") on The Nasdaq Capital Market (the "Nasdaq") or any other securities exchange.

Our Common Stock, and publicly traded warrants exercisable for one share of Common Stock for \$11.50 per share (the "Listed Warrants") are traded on Nasdaq under the symbols "ICU" and "ICUCW," respectively. On December 7, 2023, the last reported sale price on Nasdaq of our Common Stock was \$0.48 per share and the closing price of our Listed Warrants was \$0.0342 per warrant. We are a "smaller reporting company" and an "emerging growth company" as defined under the federal securities laws and, as such, have elected to comply with certain reduced reporting requirements for this prospectus and may elect to do so in future filings.

We will sell these securities directly to investors, through agents designated from time to time or to or through underwriters or dealers, on a continuous or delayed basis. For additional information on the methods of sale, you should refer to the section entitled "Plan of Distribution" in this prospectus. If any agents or underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such agents or underwriters and any applicable fees, commissions, discounts or over-allotment options will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

As of December 7, 2023, our public float, which is equal to the aggregate market value of our outstanding voting and non-voting common stock held by non-affiliates, was approximately \$16.5 million, based on 44.5 million shares of outstanding common stock, of which approximately 34.5 million shares were held by non-affiliates, and a closing sale price of our Common Stock of \$0.48 on that date. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below \$75.0 million.

***Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading "Risk Factors" on page 3 of this prospectus as well as those contained in the applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus.***

**Neither the Securities Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.**

The date of this prospectus is December \_\_\_\_\_, 2023.

---

## **TABLE OF CONTENTS**

	<b><u>Page</u></b>
<a href="#"><u>ABOUT THIS PROSPECTUS</u></a>	ii
<a href="#"><u>PROSPECTUS SUMMARY</u></a>	1
<a href="#"><u>RISK FACTORS</u></a>	3
<a href="#"><u>CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS</u></a>	4
<a href="#"><u>USE OF PROCEEDS</u></a>	5
<a href="#"><u>DESCRIPTION OF COMMON STOCK</u></a>	5
<a href="#"><u>DESCRIPTION OF PREFERRED STOCK</u></a>	6
<a href="#"><u>DESCRIPTION OF WARRANTS</u></a>	7
<a href="#"><u>DESCRIPTION OF DEBT SECURITIES</u></a>	9
<a href="#"><u>DESCRIPTION OF RIGHTS</u></a>	13
<a href="#"><u>DESCRIPTION OF UNITS</u></a>	14
<a href="#"><u>PLAN OF DISTRIBUTION</u></a>	14
<a href="#"><u>LEGAL MATTERS</u></a>	16
<a href="#"><u>EXPERTS</u></a>	16
<a href="#"><u>WHERE YOU CAN FIND MORE INFORMATION</u></a>	16
<a href="#"><u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u></a>	17

## ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 (the “Registration Statement”) that we filed with the Securities and Exchange Commission (the “SEC”) using the “shelf” registration or continuous offering process. Under this shelf registration process, we may, from time to time, sell any combination of the securities described in this prospectus in one or more offerings up to a total aggregate offering price of \$100,000,000.

This prospectus provides a general description of the securities we may offer. We may provide specific terms of securities to be offered in one or more supplements to this prospectus. We may also provide a specific plan of distribution for any securities to be offered in a prospectus supplement. Prospectus supplements may also add, update or change information in this prospectus. If the information varies between this prospectus and the accompanying prospectus supplement, you should rely on the information in the accompanying prospectus supplement.

Before purchasing any securities, you should carefully read both this prospectus and any prospectus supplement, together with the additional information described under the heading “Incorporation Of Certain Information By Reference.” You should rely only on the information contained or incorporated by reference in this prospectus, any prospectus supplement and any free underwriting prospectus prepared by or on behalf of us or to which we have referred you. Neither we nor any underwriters have authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. You should assume that the information contained in this prospectus, any prospectus supplement or any free writing prospectus is accurate only as of the date on its respective cover, and that any information incorporated by reference is accurate only as of the date of the document incorporated by reference, unless we indicate otherwise. Our business, financial condition, results of operations and prospects may have changed since those dates. This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the heading “Where You Can Find More Information.”

This prospectus and any applicable prospectus supplement do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate. We are not making offers to sell common stock or any other securities described in this prospectus in any jurisdiction in which an offer or solicitation is not authorized or in which we are not qualified to do so or to anyone to whom it is unlawful to make an offer or solicitation.

Unless otherwise expressly indicated or the context otherwise requires, we use the terms “SeaStar Medical Holding Corporation,” “Company,” “we,” “us” and “our” or similar references to refer to SeaStar Medical Holding Corporation.

## PROSPECTUS SUMMARY

*The following summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our securities. For a more complete understanding of our company and this offering, you should read and consider carefully the more detailed information included or incorporated by reference in this prospectus, including the factors described under the heading “Risk Factors.”*

### **Business Summary**

#### ***Company Overview***

We are a medical technology company focused primarily on developing and commercializing our lead product candidate, the Selective Cytopheretic Device (“SCD”), for pediatric and adult acute kidney injury (“AKI”) indications. We submitted an application for a Humanitarian Device Exemption (“HDE”) for SCD in June 2022 for the treatment of pediatric patients with AKI on continuous renal replacement therapy (“CRRT”). On September 29, 2023, we received a correspondence from the U.S. Food and Drug Administration (“FDA”) indicating that this HDE is approvable for use in children weighing 10 kilograms or more with AKI and sepsis or a septic condition requiring CRRT in the hospital intensive care unit (“ICU”). On October 30, 2023, we announced that we received the approvable letter from the FDA. Following the receipt of this approvable letter, we intend to work diligently and expeditiously to respond to these requests for additional information and address these concerns for approval of our HDE application. We anticipate receiving the HDE approval letter between December 2023 and January 2024. We believe the approval of our HDE will confirm SCD and our technology as an effective tool to treat hyperinflammation related diseases, which will enable us to successfully execute our business and growth strategies.

In addition, we have enrolled the first patient in the pivotal trial of SCD for adult patients with AKI on CRRT based on a previously approved investigative device exemption (“IDE”) protocol. The SCD received a Breakthrough Device Designation from the FDA on April 29, 2022, for the proposed use in the treatment of immunomodulatory dysregulation in adult patients who are 18 years and older with AKI. We began enrollment of adult patients in June 2023 and expect to generate interim study results by mid-2024 and topline study results and submission of a Pre-market Approval (“PMA”) application by the end of 2024, and we are targeting FDA approval by the end of 2025. There is no guarantee that we will complete the AKI adult trial in a timely manner, or at all, nor will there be any assurance that positive data will be generated from such a trial. Even if we can generate positive results from this trial, the FDA and other regulatory agencies may require us to conduct additional trials to support the study or disagree with the design of the trial and request changes or improvements to such design. To date, we have not obtained regulatory approval to commercialize or sell any of our products candidates.

On September 28, 2023, we received Breakthrough Device Designation for our patented and cell-directed SCD for use with patients in the hospital ICU with acute or chronic systolic heart failure and worsening renal function due to cardiorenal syndrome or right ventricular dysfunction awaiting implantation of a left ventricular assist device.

On October 18, 2023, we received Breakthrough Device Designation for our patented and cell-directed SCD for use with patients in the hospital ICU with AKI and acute on chronic liver failure. We have been granted three Breakthrough Device Designations from the FDA for the SCD device, each of which is expected to expedite the clinical development and regulatory review of the SCD for use in the designated patient population.

We believe that our novel therapeutic device is readily applicable for use in other indications, which will require additional clinical studies and FDA approval. As we continue our work to expand indications, we believe we would have the ability to take advantage of economies of scale to reduce costs of production. We believe our scalable manufacturing process demonstrates a significant competitive advantage in the hyperinflammatory market.

On October 23, 2022, we completed a business combination with LMAO, pursuant to that certain Agreement and Plan of Merger, dated as of April 21, 2022 (the “Merger Agreement”), by and among LMAO, LMF Merger Sub, Inc., a Delaware corporation and direct wholly owned subsidiary of LMAO (“Merger Sub”), and SeaStar Medical, Inc., a Delaware corporation (“SeaStar Medical, Inc.”). As contemplated by the Merger Agreement, SeaStar Medical, Inc. merged with and into Merger Sub, with SeaStar Medical, Inc. continuing as the surviving entity in the merger as a wholly owned subsidiary of LMAO (the “Business Combination”). In connection with the closing of the Business Combination (the “Closing”), LMAO changed its name to “SeaStar Medical Holding Corporation.”

### ***Corporate Information***

Our principal executive offices are located at 3513 Brighton Boulevard, Suite #410, Denver, Colorado 80216, and our phone number is 844-427-8100.

### ***Implications of Being a Smaller Reporting Company***

We are a “smaller reporting company” meaning that the market value of our Common Stock held by non-affiliates is less than \$250.0 million measured on the last business day of our second fiscal quarter or our annual revenue is less than \$100.0 million during the most recent completed fiscal year and the market value of our Common Stock held by non-affiliates is less than \$700.0 million measured on the last business day of our second fiscal quarter. Accordingly, we may provide less public disclosure than larger public companies, including the inclusion of only two years of audited financial statements and only two years of management’s discussion and analysis of financial condition and results of operations disclosure. As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

## **RISK FACTORS**

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should carefully consider the risk factors we describe in any prospectus supplement and in any related free writing prospectus for a specific offering of securities, as well as those incorporated by reference into this prospectus and any prospectus supplement, including those risk factors included in our most recent Annual Report on Form 10-K, any subsequent Quarterly Reports on Form 10-Q, Current Reports on Form 8-K or any amendment or update thereto reflected in our subsequent SEC filings, in evaluating an investment in our securities. The risks and uncertainties described in the applicable prospectus supplement and our other filings with the SEC incorporated by reference herein are not the only ones we face. Additional risks and uncertainties not presently known to us for that we currently consider immaterial may also adversely affect us. If any of the described risks occur, our business, financial condition, or results of operations could be materially harmed. In such case, the value of our securities could decline and you may lose all or part of your investment.

## CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents incorporated by reference herein and therein, contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”) and Section 21E of the Exchange Act of 1934, as amended (the “Exchange Act”). These statements are based on our management’s current beliefs, expectations and assumptions about future events, conditions and results and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the sections titled “Business,” “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” incorporated by reference from our most recent Annual Report on Form 10-K and our subsequent Quarterly Reports on Form 10-Q filed with the SEC, as well as any amendments thereto reflected in subsequent filings with the SEC.

Any statements in this prospectus or incorporated by reference herein or therein about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and are forward-looking statements. Within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act, these forward-looking statements may include, but are not limited to, statements regarding:

- the Company’s future capital requirements and sources and uses of cash;
- the Company’s ability to obtain funding or raise capital for its operations and future growth;
- any delays or challenges in obtaining FDA approval of the Company’s SCD product candidates;
- economic downturns and the possibility of rapid change in the highly competitive industry in which the Company operates;
- the ability to develop and commercialize its products or services following regulatory approval of the Company’s product candidates;
- the failure of third-party suppliers and manufacturers to fully and timely meet their obligations;
- product liability or regulatory lawsuits or proceedings relating to the Company’s products and services;
- inability to secure or protect its intellectual property;
- dispute or deterioration of relationship with the Company’s major partners and collaborators;
- the ability to maintain the listing of the Company’s Common Stock on Nasdaq;
- the ability to recognize the anticipated benefits of the Business Combination, which may be affected by, among other things, competition, and the ability of the Company to grow and manage growth profitably; and
- other risks and uncertainties indicated in this prospectus, including those under “Risk Factors” herein, and other filings that have been made or will be made with the SEC.

In some cases, you can identify forward-looking statements by terminology such as “anticipate,” “believe,” “continue,” “could,” “estimate,” “expects,” “intend,” “may,” “might,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative or plural of those terms, and similar expressions intended to identify statements about the future, although not all forward looking statements contain these words. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

You should refer to the risks and uncertainties described in the sections titled “Risk Factors” in this prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus, for a discussion of important factors that may cause our actual results to differ materially from those expressed or implied by our forward-looking statements. Given these risks, uncertainties and other factors, many of which are beyond our control, we cannot assure you that the forward-looking statements in this prospectus will prove to be accurate, and you should not place undue reliance on these forward-looking statements. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking

statements will be achieved or occur. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified time frame, or at all.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus, even if new information becomes available in the future.

## USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of the securities offered hereby. Unless otherwise specified in any prospectus supplement, we currently intend to use the net proceeds from the sale of our securities offered under this prospectus for working capital and general corporate purposes including, but not limited to, capital expenditures, working capital, repayment of indebtedness and other business opportunities.

## DESCRIPTION OF COMMON STOCK

*The following summary of the material terms of our securities is not intended to be a complete summary of the rights and preferences of such securities. The descriptions below are qualified by reference to the actual text of the Third Amended and Restated Certificate of Incorporation of SeaStar Medical Holding Corporation, as amended (the "Charter"). We urge you to read the Charter in its entirety for a complete description of the rights and preferences of our securities.*

### **Authorized and Outstanding Stock**

The Charter authorizes the issuance of 510,000,000 shares, consisting of (a) 500,000,000 shares of Common Stock and (b) 10,000,000 shares of preferred stock (the "Preferred Stock").

The outstanding shares of Common Stock issued in the Business Combination are duly authorized, validly issued, fully paid and non-assessable. All outstanding shares of LMAO Class B Common Stock following the Business Combination were converted into shares of LMAO Class A Common Stock on a one-to-one basis. Immediately following the conversion of such Class B Common Stock into shares of Class A Common Stock, each share of Class A Common Stock issued and outstanding was reclassified, redesignated and changed into one validly issued, fully paid and non-assessable share of Common Stock.

As of December 7, 2023, there were 44,500,000 shares of Common Stock issued and outstanding and no shares of Preferred Stock issued and outstanding.

### **Common Stock**

The Charter provides the following with respect to the rights, powers, preferences and privileges of the Common Stock:

#### ***Voting Power***

Except as otherwise required by law or as otherwise provided in any certificate of designation for any series of Preferred Stock, the holders of Common Stock possess all voting power for the election of the Company's directors and all other matters requiring stockholder action. Holders of Common Stock are entitled to one vote per share on matters to be voted on by stockholders. The Charter does not provide for cumulative voting rights.

### ***Dividends***

Subject to the rights, if any, of the holders of any outstanding shares of Preferred Stock, under the Charter, holders of Common Stock will be entitled to receive such dividends, if any, as may be declared from time to time by the Board in its discretion out of funds legally available therefor.

### ***Liquidation, Dissolution and Winding Up***

In the event of the Company's voluntary or involuntary liquidation, dissolution, distribution of assets or winding-up, the holders of the Common Stock will be entitled to receive an equal amount per share of all of the Company's assets of whatever kind available for distribution to stockholders, after the rights of the holders of the Preferred Stock have been satisfied and after payment or provision for payment of the Company's debts.

### ***Preemptive or Other Rights***

There are no preemptive rights or sinking fund provisions applicable to the shares of the Company's Common Stock.

### ***Listing***

Our Common Stock and Listed Warrants are traded on the Nasdaq Capital Market under the symbols "ICU" and "ICUCW," respectively.

## **DESCRIPTION OF PREFERRED STOCK**

The Charter provides that shares of Preferred Stock may be issued from time to time in one or more series. Our Board is authorized to fix the voting rights, if any, designations, powers, preferences, the relative, participating, optional, or other special rights and any qualifications, limitations, and restrictions thereof, applicable to the shares of each series. Our Board will be able to, without stockholder approval, issue Preferred Stock with voting and other rights that could adversely affect the voting power and other rights of the holders of the Common Stock and could have anti-takeover effects. The ability of our Board to issue Preferred Stock without stockholder approval could have the effect of delaying, deferring, or preventing a change of control of us or the removal of existing management. We have no Preferred Stock outstanding at the date hereof. Although we do not currently intend to issue any shares of Preferred Stock, we cannot assure you that we will not do so in the future.

While we have no current plans to issue Preferred Stock, circumstances in which we might issue Preferred Stock in the future could include, among others, offerings of Preferred Stock undertaken for capital raising purposes (whether before or in connection with our initial business combination or thereafter), issuances in connection with acquisitions we might make in the future, or issuances in connection with potential change of control or strategic transactions involving us. Any determination by us to issue shares of Preferred Stock in the future will be dependent on the facts and circumstances at the time.

## DESCRIPTION OF WARRANTS

The following summarizes the general terms of stock and debt warrants that we may offer. The particular terms of any stock and debt warrants will be described in an accompanying prospectus supplement. The description below and in any accompanying prospectus supplement is not complete. You should read the form of warrant agreement and any warrant certificate that we will file with the SEC.

### Warrants to Purchase Capital Stock

If we offer stock warrants, the prospectus supplement will describe the terms of the stock warrants, including:

- The offering price, if any;
- If applicable, the designation and terms of any Preferred Stock purchasable upon exercise of Preferred Stock warrants;
- The number of shares of Common Stock or Preferred Stock purchasable upon exercise of one stock warrant and the initial price at which the shares may be purchased upon exercise;
- The dates on which the right to exercise the stock warrants begins and expires;
- U.S. federal income tax consequences;
- Call provisions, if any;
- The currencies in which the offering price and exercise price are payable; and
- If applicable, the antidilution provisions of the stock warrants.

The shares of Common Stock or Preferred Stock we issue upon exercise of the stock warrants will, when issued in accordance with the stock warrant agreement, be validly issued, fully paid and nonassessable.

### Exercise of Warrants to Purchase Capital Stock

You may exercise stock warrants by surrendering to the stock warrant agent the stock warrant certificate, which indicates your election to exercise all or a portion of the stock warrants evidenced by the certificate. Surrendered stock warrant certificates must be accompanied by payment of the exercise price in the form of cash or check. The stock warrant agent will deliver certificates evidencing duly exercised stock warrants to the transfer agent. Upon receipt of the certificates, the transfer agent will deliver a certificate representing the number of shares of Common Stock or Preferred Stock purchased. If you exercise fewer than all the stock warrants evidenced by any certificate, the stock warrant agent will deliver a new stock warrant certificate representing the unexercised stock warrants.

### No Rights as Stockholders

Holders of stock warrants are not entitled to vote, to consent, to receive dividends or to receive notice as stockholders with respect to any meeting of stockholders or to exercise any rights whatsoever as our stockholders.

## **Warrants to Purchase Debt Securities**

If we offer debt warrants, the accompanying prospectus supplement will describe the terms of the warrants, including:

- The offering price, if any;
- The designation, aggregate principal amount and terms of the debt securities purchasable upon exercise of the warrants and the terms of the indenture under which the debt securities will be issued;
- If applicable, the designation and terms of the debt securities with which the debt warrants are issued and the number of debt warrants issued with each debt security;
- If applicable, the date on and after which the debt warrants and the related securities will be separately transferable;
- The principal amount of debt securities purchasable upon exercise of one debt warrant, and the price at which the principal amount of debt securities may be purchased upon exercise;
- The dates on which the right to exercise the debt warrants begins and expires;
- U.S. federal income tax consequences;
- Whether the warrants represented by the debt warrant certificates will be issued in registered or bearer form;
- The currencies in which the offering price and exercise price are payable; and
- If applicable, any antidilution provisions.

You may exchange debt warrant certificates for new debt warrant certificates of different denominations and may present debt warrant certificates for registration of transfer at the corporate trust office of the debt warrant agent, which will be listed in an accompanying prospectus supplement.

## **Exercise of Warrants to Purchase Debt Securities**

You may exercise debt warrants by surrendering the debt warrant certificate at the corporate trust office of the debt warrant agent, with payment in full of the exercise price. Upon the exercise of debt warrants, the debt warrant agent will, as soon as practicable, deliver the debt securities in authorized denominations in accordance with your instructions and at your sole cost and risk. If less than all the debt warrants evidenced by the debt warrant certificate are exercised, the agent will issue a new debt warrant certificate for the remaining amount of debt warrants.

## **No Rights as Holders of Debt Securities**

Warrant holders do not have any of the rights of holders of debt securities, except to the extent that the consent of warrant holders may be required for certain modifications of the terms of an indenture or form of the debt security, as the case may be, and the series of debt securities issuable upon exercise of the debt warrants. In addition, warrant holders are not entitled to payments of principal of and interest, if any, on the debt securities.

## DESCRIPTION OF DEBT SECURITIES

### General

We may issue debt securities either separately, or together with, or upon the conversion or exercise of or in exchange for, other securities described in this prospectus. Debt securities may be our senior, senior subordinated or subordinated obligations and may be issued in one or more series. Unless otherwise expressly stated in an accompanying prospectus supplement, the debt securities will represent our general, unsecured obligations and will rank equally with all of our other unsecured indebtedness.

Any debt securities that we issue will be issued under an indenture that will be entered into between us and a bank or trust company, or other trustee that is qualified to act under the Trust Indenture Act of 1939 (the “TIA”), which we select to act as trustee. A copy of the indenture (the “Indenture”) will be filed as an exhibit to a prospectus supplement to the registration statement of which this prospectus forms a part. The Indenture may be modified by one or more supplemental indentures, which we will incorporate by reference as an exhibit to the registration statement of which this prospectus is a part. Any debt securities that we issue will include those stated in the Indenture (including any supplemental indentures that specify the terms of a particular series of debt securities) as well as those made part of the Indenture by reference to the TIA, as in effect on the date of the Indenture. The Indenture will be subject to and governed by the terms of the TIA.

The following description and any description in an accompanying prospectus supplement is a summary only and is subject to, and qualified in its entirety by reference to the terms and provisions of the indentures and any supplemental indentures that we file with the SEC in connection with an issuance of any series of debt securities. You should read all of the provisions of the Indentures, including the definitions of certain terms, as well as any supplemental indentures that we file with the SEC in connection with the issuance of any series of debt securities. These summaries set forth certain general terms and provisions of the securities to which any accompanying prospectus supplement may relate. The specific terms and provisions of a series of debt securities and the extent to which the general terms and provisions may also apply to a particular series of debt securities will be described in the accompanying prospectus supplement. Copies of the Indenture may be obtained from us or the Trustee.

Please read the accompanying prospectus supplement relating to the series of debt securities being offered for specific terms including, when applicable:

- the title of the debt securities of the series;
- the price or prices (expressed as a percentage of the principal amount thereof) at which debt securities of the series will be issued;
- any limit on the aggregate principal amount of that series of debt securities;
- whether such securities rank as senior debt securities, senior subordinated debt securities or subordinated debt securities;
- the terms and conditions, if any, upon which the debt securities of the series shall be exchanged for or converted into other of our securities or securities of another person;
- if the debt securities of there will be secured by any collateral and, if so, a general description of the collateral and the terms and provisions of such collateral security, pledge or other agreements;
- the date or dates on which we will pay the principal of the debt securities of the series;
- the rate or rates, which may be fixed or variable, at which debt securities of the series will bear interest, if any, or the method or methods, if applicable, used to determine those rates, the date or dates, if any, from which interest on the debt securities of the series will begin to accrue, or the method or methods, if any, used to determine those dates, the dates on which the interest, if any, on the debt securities of the series will be payable and the record dates for the payment of interest;

- the manner in which the amounts of payment of principal of or interest, if any, of the debt securities of the series will be determined, if such amounts may be determined by reference to an index based on a currency or currencies or by reference to a currency exchange rate, commodity, commodity index, stock exchange index or financial index;
- if other than the corporate trust office of the Trustee, the place or places where amounts due on the debt securities of the series will be payable and where the debt securities of the series may be surrendered for registration of transfer and exchange and where notices and demands to or upon us in respect of the debt securities of the series may be served, and the method of such payment, if by wire transfer, mail or other means;
- if applicable, the period or periods within which, and the terms and conditions upon which, we may, at our option, redeem debt securities of the series;
- the terms and conditions, if applicable, upon which the holders of debt securities may require us to repurchase or redeem debt securities of the series at the option of the holders of debt securities of the series;
- the provisions, terms and conditions, if any, with respect to any sinking fund or analogous provision;
- the authorized denominations in which the debt securities of the series will be issued, if other than denominations of \$1,000 and any integral multiples of \$1,000 in excess thereof;
- whether the debt securities of the series are to be issuable, in whole or in part, in bearer form;
- whether any fully regulated debt securities of the series will be issued in temporary or permanent global form (“global debt securities”) and, if so, the identity of the depository for the global debt securities if other than The Depository Trust Company;
- any depositories, interest rate calculation agents, exchange rate calculation agents or other agents;
- the trustee for the debt securities;
- the portion of the principal amount of the debt securities of the series which will be payable upon acceleration of maturity, if other than the full principal amount;
- any addition to, or modification or deletion of, any covenant described in this prospectus or in the Indenture;

- any events of default, if not otherwise described below under “—Events of Default” and any change to the right of the holders to declare the principal of any debt securities due and payable;
- if other than U.S. dollars, the currency, currencies or currency units of denomination of the debt securities of the series, which may be any foreign currency, and if such currency denomination is a composite currency, the agency or organization, if any, responsible for overseeing such composite currency;
- if other than U.S. dollars, the currency, currencies or currency units in which the purchase price for the debt securities of the series will be payable, in which payments of principal and, if applicable, premium or interest on the debt securities of the series will be payable, and, if necessary, the manner in which the exchange rate with respect to such payments will be determined;
- any listing of the debt securities on any securities exchange;
- any additions or deletions to the defeasance or the satisfaction and discharge provisions set forth herein;
- if and under what circumstances we will pay additional amounts (“Additional Amounts”) on the debt securities of the series in respect of specified taxes, assessments or other governmental charges and, if so, whether we will have the option to redeem the debt securities of the series rather than pay the Additional Amounts;
- the priority and kind of any lien securing the debt securities and a brief identification of the principal properties subject to such lien;
- additions or deletions to or changes in the provisions relating to modification of any Indenture; and
- any other terms of the debt securities of the series (whether or not such other terms are consistent or inconsistent with any other terms of the Indenture).

As used in this prospectus and any accompanying prospectus supplement relating to the offering of debt securities of any series, references to the principal of and premium, if any, and interest, if any, on the debt securities of the series include the payment of Additional Amounts, if any, required by the debt securities of the series to be paid in that context.

Debt securities may be issued as original issue discount securities to be sold at a substantial discount below their principal amount. In the event of an acceleration of the maturity of any original issue discount security, the amount payable to the holder upon acceleration will be determined in the manner described in the accompanying prospectus supplement. Certain U.S. federal income tax considerations applicable to original issue discount securities will be described in any accompanying prospectus supplement.

If the purchase price of any debt securities is payable in a foreign currency or if the principal of, or premium, if any, or interest, if any, on any debt securities is payable in a foreign currency, the specific terms of those debt securities and the applicable foreign currency will be specified in the accompanying prospectus supplement relating to those debt securities.

The terms of the debt securities of any series may differ from the terms of the debt securities of any other series, and the terms of particular debt securities within any series may differ from each other. Unless otherwise expressly provided in the accompanying prospectus supplement relating to any series of debt securities, we may, without the consent of the holders of the debt securities of any series, reopen an existing series of debt securities and issue additional debt securities of that series.

Unless otherwise described in an accompanying prospectus supplement relating to any series of debt securities and except to the limited extent set forth below under “—Merger, Consolidation and Transfer of Assets,” there will be no limitation upon our ability to incur indebtedness or other liabilities or that would afford holders of debt securities protection in the event of a business combination, takeover, recapitalization or highly leveraged or similar transaction involving us. Accordingly, we may in the future enter into transactions that could increase the amount of our consolidated indebtedness and other liabilities or otherwise adversely affect our capital structure or credit rating without the consent of the holders of the debt securities of any series.

### **Registration, Transfer and Payment**

Unless otherwise indicated in the applicable prospectus supplement, each series of debt securities will be issued in registered form only, without coupons.

Unless otherwise indicated in the applicable prospectus supplement, debt securities will be issued in denominations of \$1,000 or any integral multiples of \$1,000 in excess thereof.

Unless otherwise indicated in the accompanying prospectus supplement, the debt securities will be payable and may be surrendered for registration of transfer or exchange and, if applicable, for conversion into or exchange for other securities or property, at an office or agency maintained by us in the United States. However, we may, at our option, make payments of interest on any registered debt security by check mailed to the address of the person entitled to receive that payment or by wire transfer to an account maintained by the payee with a bank located in the United States. Unless otherwise indicated in the accompanying prospectus supplement, no service charge shall be made for any registration of transfer or exchange, redemption or repayment of debt securities, or for any conversion or exchange of debt securities for other securities or property, but we may require payment of a sum sufficient to cover any tax or other governmental charge that may be imposed in connection with that transaction.

Unless otherwise indicated in the applicable prospectus supplement, we will not be required to:

- issue, register the transfer of or exchange debt securities of any series during a period beginning at the opening of business 15 days before any mailing of a notice of a redemption for the debt securities of that series selected for redemption and ending at the close of business on the day of such mailing; or
- register the transfer of or exchange any debt security, or portion of any debt security, selected for redemption, except the unredeemed portion of any registered debt security being redeemed in part.

## **Book-Entry Debt Securities**

We may issue the debt securities in whole or in part in the form of one or more global certificates or notes, which we refer to as global securities, that we will deposit with a depository or its nominee that we identify in the applicable prospectus supplement.

We will describe the specific terms of the depository arrangement covering the debt securities in the prospectus supplement relating to that series. We anticipate that the following provisions will apply to all depository arrangements.

Upon the issuance of the debt securities in the form of one or more global securities, the depository or its custodian will credit, on its book-entry registration and transfer system, the number of shares or principal amount of securities of the individual beneficial interests represented by these global securities to the respective accounts of persons who have accounts with the depository. Ownership of beneficial interests in the global securities will be shown on, and the transfer of this ownership will be effected only through, records maintained by the depository or its nominee with respect to interests of participants and the records of participants with respect to interests of persons other than participants. These accounts initially will be designated by or on behalf of the underwriters, initial purchasers or agents, or by us if we offer and sell the debt securities directly, and ownership of beneficial interests in the global securities will be limited to participants or persons who hold interests through participants. Qualified institutional buyers may hold their interests in the global securities directly through the depository if they are participants in this system, or indirectly through organizations which are participants in this system. The laws of some states of the U.S. may require that some purchasers of securities take physical delivery of the debt securities in definitive registered form. These limits and the laws may impair your ability to own, transfer or pledge interests in the global securities.

So long as the depository, or its nominee, is the registered owner or holder of the debt securities, the depository or its nominee, as the case may be, will be considered the sole owner or holder of the debt securities represented by the global securities for all purposes. No beneficial owner of an interest in the global securities will be able to transfer that interest except in accordance with the depository's procedures.

We will make dividend payments on, or payments of the principal of, and premium, if any, and interest on, the global securities to the depository or its nominee, as the case may be, as the registered owner of the global securities. We will not have any responsibility or liability for any aspect of the records relating to or payments made on account of beneficial ownership interests in the global securities or for maintaining, supervising or reviewing any records relating to the beneficial ownership interest.

We expect that the depository or its nominee, upon receipt of any dividend payment on, or payment of the principal of, and premium, if any, and interest on, the global securities, will credit participants' accounts with payments in amounts proportionate to their respective beneficial interests in the debt securities as shown on the records of the depository or its nominee. We also expect that payments by participants to owners of beneficial interests in the global securities held through the participants will be governed by standing instructions and customary practice, as is now the case with securities held for the accounts of customers registered in the names of nominees for their customers. These payments will be the responsibility of the participants. Transfers between participants in the depository will be effected in the ordinary way through the depository's settlement system in accordance with the depository rules and will be settled in same day funds.

We will issue securities in certificated form in exchange for global securities (subject, in the case of the third bullet point, to the procedures of the depository) if:

- the depository notifies us that it is unwilling or unable to continue as a depository for the global securities or ceases to be a "clearing agency" registered under the Exchange Act of 1934, and a successor depository is not appointed by us within 90 days of the notice;
- an event of default under the instrument governing the debt securities has occurred and is continuing; or
- we determine that the debt securities will no longer be represented by the global securities.

## **DESCRIPTION OF RIGHTS**

As specified in the applicable prospectus supplement, we may issue rights to purchase the securities offered in this prospectus to our existing stockholders, and such rights may or may not be issued for consideration. The applicable prospectus supplement will describe the terms of any such rights. The description in the prospectus supplement will not purport to be complete and will be qualified in its entirety by reference to the documents pursuant to which such rights will be issued.

## DESCRIPTION OF UNITS

As may be specified in an accompanying prospectus supplement, we may issue units consisting of one or more of our securities registered hereby. An accompanying prospectus supplement will describe:

- the terms of the units and of the securities comprising the units, including whether and under what circumstances the securities comprising the units may be traded separately;
- a description of the terms of any unit agreement governing the units; and
- a description of the provisions for the payment, settlement, transfer or exchange of the units.

## PLAN OF DISTRIBUTION

We may sell the securities from time to time, by a variety of methods, including the following:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales made after the date the Registration Statement is declared effective by the SEC;
- broker-dealers may agree with a us to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The securities may be distributed from time to time in one or more transactions:

- at a fixed price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

Offers to purchase the securities being offered by this prospectus may be solicited directly. Agents may also be designated to solicit offers to purchase the securities from time to time. Any agent involved in the offer or sale of our securities will be identified in a prospectus supplement.

If a dealer is utilized in the sale of the securities being offered by this prospectus, the securities will be sold to the dealer as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale.

If an underwriter is utilized in the sale of the securities being offered by this prospectus, an underwriting agreement will be executed with the underwriter at the time of sale and the name of any underwriter will be provided in the prospectus supplement that the underwriter will use to make resales of the securities to the public. In connection with the sale of the securities, we, or the purchasers of securities for whom the underwriter may act as agent, may compensate the underwriter in the form of underwriting discounts or commissions. The underwriter may sell the securities to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for which they may act as agent. Unless otherwise indicated in a prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase securities as a principal, and may then resell the securities at varying prices to be determined by the dealer.

Any compensation paid to underwriters, dealers or agents in connection with the offering of the securities, and any discounts, concessions or commissions allowed by underwriters to participating dealers will be provided in the applicable prospectus supplement. Underwriters, dealers and agents participating in the distribution of the securities may be deemed to be underwriters within the meaning of the Securities Act, and any discounts and commissions received by them and any profit realized by them on resale of the securities may be deemed to be underwriting discounts and commissions. In compliance with the guidelines of the Financial Industry Regulatory Authority, Inc., or FINRA, the maximum amount of underwriting compensation, including underwriting discounts and commissions, to be paid in connection with any offering of securities pursuant to this prospectus may not exceed 8% of the aggregate principal amount of securities offered. We may enter into agreements to indemnify underwriters, dealers and agents against civil liabilities, including liabilities under the Securities Act, or to contribute to payments they may be required to make in respect thereof and to reimburse those persons for certain expenses. The securities may or may not be listed on a national securities exchange. To facilitate the offering of securities, certain persons participating in the offering may engage in transactions that stabilize, maintain or otherwise affect the price of the securities. This may include over-allotments or short sales of the securities, which involve the sale by persons participating in the offering of more securities than were sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment option, if any. In addition, these persons may stabilize or maintain the price of the securities by bidding for or purchasing securities in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if securities sold by them are repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. These transactions may be discontinued at any time.

If indicated in the applicable prospectus supplement, underwriters or other persons acting as agents may be authorized to solicit offers by institutions or other suitable purchasers to purchase the securities at the public offering price set forth in the prospectus supplement, pursuant to delayed delivery contracts providing for payment and delivery on the date or dates stated in the prospectus supplement. These purchasers may include, among others, commercial and savings banks, insurance companies, pension funds, investment companies and educational and charitable institutions. Delayed delivery contracts will be subject to the condition that the purchase of the securities covered by the delayed delivery contracts will not at the time of delivery be prohibited under the laws of any jurisdiction in the United States to which the purchaser is subject. The underwriters and agents will not have any responsibility with respect to the validity or performance of these contracts.

We may engage in at-the-market offerings into an existing trading market in accordance with rule 415(a)(4) under the Securities Act. In addition, we may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement so indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us, or borrowed from us or others to settle those sales or to close out any related open borrowings of Common Stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of our Common Stock. In addition, we may loan or pledge securities to a financial institution or other third party that in turn may sell the securities using this prospectus and an applicable prospectus supplement. Such financial institution or other third party may transfer its economic short position to investors in our securities or in connection with a concurrent offering of other securities.

The underwriters, dealers and agents may engage in transactions with us, or perform services for us, in the ordinary course of business for which they receive compensation.

## **LEGAL MATTERS**

The validity of the Shares have been passed upon by Morgan Lewis Bockius LLP, Palo Alto, California.

## **EXPERTS**

The consolidated financial statements as of December 31, 2022 and 2021, and for each of the years then ended incorporated by reference in this prospectus have been so incorporated in reliance on the report of Armanino LLP an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting. The report on the consolidated financial statements contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

## **WHERE YOU CAN FIND MORE INFORMATION**

This prospectus is part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and does not contain all of the information set forth or incorporated by reference in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. We file annual, quarterly, and current reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including SeaStar Medical Holding Corporation. The address of the SEC website is [www.sec.gov](http://www.sec.gov).

We maintain a website at [www.SeaStarmedical.com](http://www.SeaStarmedical.com). Information contained in or accessible through our website does not constitute a part of this prospectus.

## INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” into this prospectus the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference into this document modifies or supersedes the statement. We incorporate by reference in this prospectus the following information (other than, in each case, documents or information deemed to have been furnished and not filed in accordance with SEC rules):

- our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on [March 30, 2023](#), and as amended on Form 10-K/A, filed with the SEC on [April 28, 2023](#);
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2023, June 30, 2023, and September 30, 2023, filed with the SEC on [May 15, 2023](#), [August 14, 2023](#), and [November 14, 2023](#), respectively;
- our Current Reports on Form 8-K filed with the SEC on [January 9, 2023](#), [February 9, 2023](#), [February 15, 2023](#), [March 16, 2023](#), [May 9, 2023](#), [June 9, 2023](#), [June 16, 2023](#), [June 30, 2023](#), [August 2, 2023](#), [August 8, 2023](#), [August 30, 2023](#), [September 8, 2023](#), [September 20, 2023](#), [September 26, 2023](#), [October 3, 2023](#), [October 30, 2023](#), [November 27, 2023](#), and [November 29, 2023](#); and
- the description of our Common Stock which is registered under Section 12 of the Exchange Act, in our registration statement on Form 8-A, filed on [January 22, 2021](#), including any amendments or reports filed for the purposes of updating this description.

We also incorporate by reference in to this prospectus all documents (other than Current Reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items) that are filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, as well as after the date of this prospectus until we file a post-effective amendment that indicates the termination of the offering of the shares of our Common Stock made by this prospectus and will become a part of this prospectus from the date that such documents are filed with the SEC. These documents include periodic reports, such as Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, as well as proxy statements.

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered, without charge upon written or oral request, a copy of any or all of the documents that are incorporated by reference into this prospectus but not delivered with this prospectus, including exhibits which are specifically incorporated by reference into such documents. You should direct any requests for documents to SeaStar Medical Holding Corporation 3513 Brighton Blvd., Suite 410 Denver, CO 80216; telephone: (844) 427-8100.

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference in to this document modifies or supersedes the statement.

**SeaStar Medical Holding Corporation**

**Up to \$25,000,000 shares of  
Common Stock**

**PROSPECTUS SUPPLEMENT**

**H.C. Wainwright & Co.**

**August 20, 2024**

---