

Cardiovascular Systems Inc
Form S-3
October 14, 2011
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As filed with the Securities and Exchange Commission on October 14, 2011

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

CARDIOVASCULAR SYSTEMS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

No. 41-1698056
(I.R.S. Employer
Identification Number)

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651 Campus Drive

St. Paul, Minnesota 55112-3495

(651) 259-1600

(Address, including zip code, and telephone number, including area code, of principal executive offices)

Laurence L. Betterley

Chief Financial Officer

Cardiovascular Systems, Inc.

651 Campus Drive

St. Paul, Minnesota 55112-3495

(651) 259-1600

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Please send copies of all communications to:

Robert K. Ranum, Esq.

Alexander Rosenstein, Esq.

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200 South Sixth Street, Suite 4000

Minneapolis, MN 55402

Fax: (612) 492-7077

Approximate date of commencement of proposed sale to the public: From time to time after the effectiveness of the Registration Statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

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If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. "

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. "

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. "

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

| | | |
|---|---------------------------|---|
| Large accelerated filer " | Accelerated filer | x |
| Non-accelerated filer " (Do not check if a smaller reporting company) | Smaller reporting company | " |

CALCULATION OF REGISTRATION FEE

| Title of Each Class of Securities to be Registered | Amount to be Registered(1) | Proposed Maximum Offering Price Per Share(2) | Proposed Maximum Offering Price(2) Aggregate | Amount of Registration Fee |
|---|----------------------------------|---|---|-------------------------------|
| Common Stock, \$0.001 par value per share | 161,747 | \$7.48 | \$1,209,868 | \$139 |
| Common Stock, \$0.001 par value per share(3) | 167,241 | \$7.48 | \$1,250,963 | \$144 |
| Total | 328,988 | \$7.48 | \$2,460,831 | \$283 |

- (1) The amount represents shares of the registrant's common stock held by the selling stockholders named in the prospectus contained herein. All 328,988 shares, which number includes 167,241 shares of common stock issuable upon the exercise of warrants held by certain selling stockholders, registered pursuant to this registration statement are to be offered by the selling stockholders. Pursuant to Rule 416 under the Securities Act of 1933, as amended (the Securities Act), this registration statement also covers such number of additional shares of common stock necessary to prevent dilution resulting from stock splits, stock dividends or similar events.
- (2) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(c) of the Securities Act. The proposed maximum offering price per share and proposed maximum aggregate offering price are based upon the average of the high \$7.68 and low \$7.28 sales prices of the registrant's common stock on October 10, 2011, as reported on the NASDAQ Global Market.
- (3) The amount represents shares to be offered and sold by certain selling stockholders upon the exercise of certain exercisable warrants.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the

Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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The information in this prospectus is not complete and may be changed. The selling stockholders may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION DATED OCTOBER 14, 2011

PROSPECTUS

CARDIOVASCULAR SYSTEMS, INC.

328,988 Shares

Common Stock

The selling stockholders identified in this prospectus may sell, from time to time, up to 328,988 shares of our common stock, \$0.001 par value per share, consisting of:

161,747 shares of common stock that were issued to certain selling stockholders upon the prior exercise of warrants to purchase our common stock, which warrants were originally issued in July 2006; and

167,241 shares of common stock that may be issued to certain selling stockholders upon the future exercise of warrants to purchase our common stock, which warrants were originally issued in February 2009.

The selling stockholders may offer for sale or otherwise distribute the shares of our common stock covered by this prospectus in one or more transactions, directly or through underwriters, brokers or dealers or agents, in public or private transactions, at fixed prices, prevailing market prices at the times of sale, prices related to the prevailing market prices, varying prices determined at the times of sale or negotiated prices. For additional information on the methods of sale, you should refer to the section of this prospectus entitled *Plan of Distribution*.

Although we may receive cash proceeds from the exercise of the warrants referenced above, we will not receive any of the proceeds from the sale of these shares by the selling stockholders. We will bear all expenses in connection with this offering of our common stock, other than any underwriting fees, discounts, selling commissions and stock transfer taxes, if any.

Our common stock is traded on the Nasdaq Global Market under the symbol CSII. On October 12, 2011, the closing price of our common stock was \$8.40.

Investing in our securities involves risks. See Risk Factors on page 2. You should carefully read this prospectus, the documents incorporated herein, and any applicable prospectus supplement before making any investment decision.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

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The date of this prospectus is _____, 2011

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the SEC. This prospectus does not contain all of the information set forth in the registration statement, certain parts of which are omitted in accordance with the rules and regulations of the SEC. Accordingly, you should refer to the registration statement and its exhibits for further information about us and our common stock. Copies of the registration statement and its exhibits are on file with the SEC.

Statements contained in this prospectus concerning the documents we have filed with the SEC are not intended to be comprehensive, and in each instance we refer you to the copy of the actual document filed as an exhibit to the registration statement or otherwise filed with the SEC.

You should rely only on the information contained in or incorporated by reference into this prospectus (as supplemented and amended). We have not authorized anyone to provide you with different information. This document may only be used where it is legal to sell these securities. You should not assume that the information contained in this prospectus is accurate as of any date other than its date regardless of the time of delivery of the prospectus or any sale of our common stock.

We urge you to read carefully this prospectus (as supplemented and amended), together with the information incorporated herein by reference as described under the heading *Incorporation of Documents by Reference*, before deciding whether to invest in any of the common stock being offered.

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OUR COMPANY

We are a medical device company focused on developing and commercializing minimally invasive treatment solutions for vascular disease. Interventional endovascular treatment of peripheral artery disease, or PAD, is our initial area of focus. PAD is caused by the accumulation of plaque in peripheral arteries, most commonly occurring in the pelvis and legs. PAD is a progressive disease, and, if left untreated, can lead to limb amputation or death.

Our primary products, the Diamondback 360° PAD System (Diamondback 360°), Diamondback Predator 360° PAD System (Predator 360°) and Stealth 360° PAD System (Stealth 360°), are catheter-based platforms capable of treating a broad range of plaque types in leg arteries both above and below the knee and address many of the limitations associated with existing treatment alternatives. We refer to the Diamondback 360°, the Predator 360° and the Stealth 360° collectively in this prospectus as the PAD Systems. In August 2007, the U.S. Food and Drug Administration, or FDA, granted us 510(k) clearance for the use of the Diamondback 360° as a therapy in patients with PAD. We commenced a limited commercial introduction of the Diamondback 360° in the United States in September 2007 and began a full commercial launch during the quarter ended March 31, 2008. We received 510(k) clearance of the Predator 360° in March 2009 and commenced commercial launch in April 2009. We received 510(k) clearance of the Stealth 360° in March 2011 and commenced a limited market release that same month. We continued this limited release through the first quarter of fiscal 2012, ended September 30, 2011. As of September 30, 2011, the PAD Systems had been utilized in more than 55,000 procedures.

We intend to leverage the capabilities of the PAD Systems to expand into the interventional coronary market though we need to complete certain clinical trials and receive FDA approval to do so. In May 2011, we received approval from the FDA to complete enrollment of 429 patients in our ORBIT II clinical trial for a coronary application for the Diamondback 360°, which followed the FDA's review of data from the first 50 cases in the ORBIT II trial.

In addition to the PAD Systems, we are expanding our product portfolio through internal product development and establishment of business relationships with other medical device companies. We now offer multiple accessory products designed to complement the use of the PAD Systems, and we have entered into a distribution agreement with Asahi Intecc Co., Ltd. to market its peripheral guidewire line in the United States.

We were incorporated as Replidyne, Inc. in Delaware in 2000. On February 25, 2009, Replidyne, Inc. completed its business combination with Cardiovascular Systems, Inc., a Minnesota corporation (CSI-MN), in accordance with the terms of the Agreement and Plan of Merger and Reorganization, dated as of November 3, 2008, by and among Replidyne, Responder Merger Sub, Inc., a wholly-owned subsidiary of Replidyne (Merger Sub), and CSI-MN (the Merger Agreement). Pursuant to the Merger Agreement, Merger Sub merged with and into CSI-MN, with CSI-MN continuing after the merger as the surviving corporation and a wholly-owned subsidiary of Replidyne. At the effective time of the merger, Replidyne changed its name to Cardiovascular Systems, Inc. (CSI) and CSI-MN changed its name to CSI Minnesota, Inc. As of immediately following the effective time of the merger, former CSI-MN stockholders owned approximately 80.2% of the outstanding common stock of the combined company, and Replidyne stockholders owned approximately 19.8% of the outstanding common stock of the combined company. Following the merger of Merger Sub with CSI-MN, CSI-MN merged with and into CSI, with CSI continuing after the merger as the surviving corporation. These transactions are referred to herein as the merger. Unless the context otherwise requires, all references herein to the Company, CSI, we, us and our refer to CSI-MN prior to the completion of the merger and to CSI following the completion of the merger and name change, and all references to Replidyne refer to Replidyne prior to the completion of the merger and the name change.

Replidyne was a biopharmaceutical company focused on discovering, developing, in-licensing and commercializing anti-infective products.

CSI-MN was incorporated in Minnesota in 1989. From 1989 to 1997, we engaged in research and development on several different product concepts that were later abandoned. Since 1997, we have devoted substantially all of our resources to the development of the PAD Systems (as hereafter defined) and our Viper line of ancillary products.

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Our common stock is traded on the Nasdaq Global Market under the symbol CSII. On October 12, 2011, the closing price of our common stock was \$8.40. As of October 12, 2011, the aggregate market value of our outstanding common stock held by non-affiliates was approximately \$82,535,000, based on 17,848,386 shares of outstanding common stock, of which approximately 9,825,565 shares are held by non-affiliates, and a per share price of \$8.40 based on the closing sale price of our common stock on October 12, 2011.

Our principal executive office is located at 651 Campus Drive, St. Paul, Minnesota 55112. Our telephone number is (651) 259-1600, and our website is www.csi360.com. The information contained in or connected to our website is not incorporated by reference into, and should not be considered part of, this prospectus.

THE OFFERING

The selling stockholders named in this prospectus may offer and sell up to 328,988 shares of our common stock, which number includes 167,241 shares of common stock to be issued upon the future exercise of warrants. Our common stock is listed on the Nasdaq Global Market under the symbol CSII. We will not receive any of the proceeds of sales by the selling stockholders of any of the common stock covered by this prospectus. Throughout this prospectus, when we refer to the shares of our common stock, the offer and sale of which are being registered on behalf of the selling stockholders, we are referring to the shares of common stock held by Maverick Fund, L.D.C., Maverick Fund II, Ltd. and Maverick Fund USA, Ltd., or collectively, the Maverick Funds; and to the shares of common stock issuable upon the exercise of warrants held by Whitebox Multi-Strategy Partners, L.P. and Whitebox Credit Arbitrage Partners, L.P., or collectively, the Whitebox Entities. When we refer to the selling stockholders in this prospectus, we are referring to the Maverick Funds and Whitebox Entities and, as applicable, any donees, pledgees, transferees or other successors-in-interest selling shares received after the date of this prospectus from the selling stockholders as a gift, pledge, distribution or other non-sale related transfer.

RISK FACTORS

Investing in our securities involves risk. You should consider the risks, uncertainties and assumptions discussed under the heading Risk Factors in our Annual Report on Form 10-K for the fiscal year ended June 30, 2011, filed on September 12, 2011 with the Securities and Exchange Commission (SEC), which is incorporated herein by reference, and may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations. If any of these risks were to occur, our business, financial condition, and results of operations could be severely harmed. This could cause the trading price of our common stock to decline, and you could lose all or part of your investment.

FORWARD-LOOKING STATEMENTS

This prospectus and the other documents we have filed with the SEC that are incorporated herein by reference contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 that involve risks and uncertainties, as well as assumptions that, if they never materialize or prove incorrect, could cause the results of CSI to differ materially from those expressed or implied by such forward-looking statements. All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including any projections of financing needs, revenue, expenses, earnings or losses from operations, or other financial items; any statements of the plans, strategies and objectives of management for future operations; any statements concerning product research, development and commercialization plans and timelines; any statements regarding safety and efficacy of product candidates; any statements of expectation or belief; and any statements of assumptions underlying any of the foregoing. In addition, forward-looking statements may contain the words believe, anticipate, expect, estimate, intend, plan, project, will be, will continue, will result, seek, could, may, might, or other words with similar meanings.

Given these uncertainties, you should not place undue reliance on these forward-looking statements. You should read this prospectus, any supplements to this prospectus and the documents that we reference in this prospectus with the understanding that our actual future results may be materially different from what we expect.

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Except as required by law, we do not undertake any obligation to update or revise any forward-looking statements contained in this prospectus and any supplements to this prospectus, whether as a result of new information, future events or otherwise.

USE OF PROCEEDS

We are filing the registration statement of which this prospectus is a part under our contractual obligations to the holders named in the section entitled *Selling Stockholders*. Although we may receive cash proceeds from the exercise of the warrants issued to the Whitebox Entities, which we expect to be \$1,476,738 if the warrants are exercised in full, we will not receive any proceeds from the sale of our common stock by the selling stockholders. The selling stockholders will pay any underwriting discounts or selling commissions incurred in disposing of the common stock. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares of common stock covered by this prospectus. Any cash proceeds received from the exercise of warrants will be used for general working capital purposes.

PLAN OF DISTRIBUTION

We are registering a total of 328,988 shares of our common stock for sale by the selling stockholders, including 167,241 shares of common stock to be issued upon the future exercise of warrants, pursuant to the terms of a registration rights agreement between us and the selling stockholders, among others. A copy of the registration rights agreement was filed with the SEC and is incorporated by reference as an exhibit to the registration statement of which this prospectus is a part. The selling stockholders and any of their donees, pledgees, transferees or other successors-in-interest may, from time to time after the date of this prospectus, sell any or all of the shares of common stock offered hereby on any stock exchange, market or trading facility on which the shares are traded or in private transactions. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock. We will bear all fees and expenses incident to our obligation to register the shares of common stock.

The selling stockholders may decide not to exercise their warrants or sell any shares of common stock. The selling stockholders may sell all or a portion of the shares of common stock beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions from the selling stockholders and/or the purchasers of the shares of common stock for whom they may act as agent. In effecting sales, broker-dealers that are engaged by the selling stockholders may arrange for other broker-dealers to participate. The selling stockholders may be deemed underwriters within the meaning of the Securities Act. Any brokers, dealers or agents who participate in the distribution of the shares of common stock by the selling stockholders may also be deemed to be underwriters, and any profits on the sale of the shares of common stock by them and any discounts, commissions or concessions received by any such brokers, dealers or agents may be deemed to be underwriting discounts and commissions under the Securities Act. To our knowledge, the selling stockholders have not entered into any agreement, arrangement or understanding with any particular broker-dealer or market maker with respect to the shares of common stock offered hereby, nor do we know the identity of the broker-dealers or market makers that may participate in the resale of the shares. Because the selling stockholders and any other selling stockholders, brokers, dealers or agents may be deemed to be underwriters within the meaning of the Securities Act, the selling stockholders and any other selling stockholders, brokers, dealers or agents may be subject to the prospectus delivery requirements of the Securities Act and may be subject to certain statutory liabilities of the Securities Act (including, without limitation, Sections 11, 12 and 17 thereof) and Rule 10b-5 under the Exchange Act.

The selling stockholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. The shares of common stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions, pursuant to one or more of the following methods:

through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;

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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 Nasdaq Global Market;

privately negotiated transactions;

broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;

through the settlement of short sales effected after the date the registration statement is declared effective; and

a combination of any such methods of sale.

Any broker-dealer participating in such transactions as agent may receive commissions from the selling stockholders (and, if they act as agent for the purchaser of such shares, from such purchaser). The selling stockholders have informed us that any such broker-dealer would receive commissions from the selling stockholders that would not exceed customary brokerage commissions. Broker-dealers may agree with the selling stockholders to sell a specified number of shares at a stipulated price per share, and, to the extent such a broker-dealer is unable to do so acting as agent for any selling stockholders, to purchase as principal any unsold shares at the price required to fulfill the broker-dealer commitment to any selling stockholders. Broker-dealers who acquire shares as principal may thereafter resell such shares from time to time in one or more transactions (which may involve crosses and block transactions and which may involve sales to and through other broker-dealers, including transactions of the nature described above and pursuant to one or more of the methods described above) at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices, and in connection with such resales may pay to or receive from the purchasers of such shares commissions computed as described above. To the extent required under the Securities Act, an amendment to this prospectus or a supplemental prospectus will be filed, disclosing:

the name of any such broker-dealers;

the number of shares involved;

the price at which such shares are to be sold;

the commission paid or discounts or concessions allowed to such broker-dealers, where applicable;

that such broker-dealers did not conduct any investigation to verify the information set out or incorporated by reference in this prospectus, as supplemented; and

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other facts material to the transaction.

The selling stockholders have informed us that, as of the date of this prospectus, they do not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the common stock.

Under the securities laws of some states, the shares of common stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of common stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

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The selling stockholders may also sell shares of common stock covered by this prospectus pursuant to Rule 144 promulgated under the Securities Act, if available, rather than under this prospectus. In addition, the selling stockholders may transfer the shares of common stock by other means not described in this prospectus, including, among other things, through distributions to the selling stockholders' general partners and/or limited partners.

Underwriters and purchasers that are deemed underwriters under the Securities Act may engage in transactions that stabilize, maintain or otherwise affect the price of the common stock, including the entry of stabilizing bids or syndicate covering transactions, or the imposition of penalty bids, on the Nasdaq Global Market. The selling stockholders and any other person participating in the sale or distribution of the shares of common stock will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder (including, without limitation, Regulation M of the Exchange Act), which may restrict certain activities of, and limit the timing of purchases and sales of any of the shares of common stock by, the selling stockholders and any other participating person. To the extent applicable, Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making and certain other activities with respect to the shares of common stock. In addition, the anti-manipulation rules under the Exchange Act may apply to sales of the shares of common stock in the market. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

Under the registration rights agreement, we have agreed with the selling stockholders to keep the registration statement of which this prospectus constitutes a part effective until the date that all of the shares of common stock covered by the registration statement have been sold.

We have agreed, among other things, to pay all expenses of the registration of the shares of common stock, including, without limitation, SEC filing fees and expenses of compliance with state securities or "Blue Sky" laws; provided, however, that the selling stockholders will pay all underwriting discounts and selling commissions applicable to the sale of the shares of common stock. We have agreed to indemnify the selling stockholders and certain other persons against certain liabilities in connection with the offering of shares of common stock offered hereby, including liabilities arising under the Securities Act or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities. The selling stockholders have, subject to certain limitations, agreed to indemnify us against liabilities under the Securities Act that may arise from any written information furnished to us by the selling stockholders specifically for use in this prospectus or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities.

At any time a particular offer of the shares of common stock is made by the selling stockholders or their donees, pledgees, transferees or other successors-in-interest, a revised prospectus or prospectus supplement, if required, will be distributed. Such prospectus supplement and related post-effective amendment, if required, will be filed with the SEC to reflect the disclosure of any required additional information with respect to the distribution of the shares of common stock. We may suspend the sale of shares by the selling stockholders pursuant to this prospectus for certain periods of time for certain reasons, including if the prospectus is required to be supplemented or amended to include additional material information.

SELLING STOCKHOLDERS

We have agreed to prepare, on behalf of the selling stockholders, a registration statement on Form S-3, of which this prospectus forms a part, to register with the SEC the offer and sale by the selling stockholders of the shares of common stock to be sold in this offering.

The following table sets forth information regarding the selling stockholders' beneficial ownership of our common stock as of October 12, 2011, and as adjusted to reflect the sale of common stock being offered in this offering. The shares of common stock registered for sale by the Maverick Funds were issued upon the prior exercise of warrants to purchase our common stock, which warrants were originally issued to the Maverick Funds in a private placement by CSI-MN, the predecessor company to the Company, in July 2006. The shares of common stock registered for sale by the Whitebox Entities may be issued upon the future exercise of warrants to purchase our common stock, which warrants were originally issued to the Whitebox Entities in February 2009.

The information in the following table has been presented in accordance with SEC rules. Under these rules, beneficial ownership of a class of capital stock includes any shares of such class as to which a person, directly or

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indirectly, has or shares voting power or investment power and also any shares as to which a person has the right to acquire such voting or investment power within 60 days through the exercise of any options, warrants or other rights. Shares subject to options, warrants or other rights are not deemed outstanding for the purpose of computing the percentage ownership of any other person. Except as indicated below, we believe that the selling stockholders have sole voting and investment power with respect to the shares shown.

| Name of Selling Stockholder | Shares Beneficially Owned before this Offering | | Number of Shares to be Sold in this Offering | Shares Beneficially Owned After this Offering | |
|---|--|-------|--|---|-------|
| | Number | % (1) | | Number (2) | % (2) |
| Maverick Fund, L.D.C.(3) | 71,135 | * | 71,135 | | |
| Maverick Fund USA, Ltd.(3) | 28,719 | * | 28,719 | | |
| Maverick Fund II, Ltd.(3) | 61,893 | * | 61,893 | | |
| Whitebox Multi-Strategy Partners, L.P.(4) | 83,147 | * | 83,147 | | |
| Whitebox Credit Arbitrage Partners, L.P.(4) | 84,094 | * | 84,094 | | |

* Less than 1%

- (1) Applicable percentage ownership is based on 17,848,386 shares of common stock outstanding on October 12, 2011.
- (2) Assumes the sale of all shares being offered pursuant to this prospectus.
- (3) Maverick Capital, Ltd. is an investment adviser registered under Section 203 of the Investment Advisers Act of 1940 and, as such, may be deemed to have beneficial ownership of the shares held by Maverick Fund USA, Ltd., Maverick Fund, L.D.C. and Maverick Fund II, Ltd. through the investment discretion it exercises over these accounts. Maverick Capital Management, LLC is the general partner of Maverick Capital, Ltd. Lee S. Ainslie III is the manager of Maverick Capital Management, LLC who possesses sole investment discretion, including the ability to vote and dispose of the shares, pursuant to Maverick Capital Management, LLC's regulations. The address for the entities affiliated with Maverick Capital, Ltd. is 300 Crescent Court, 18th Floor, Dallas, TX 75201. Christy Wyskiel served on CSI-MN's board of directors from 2006 until the closing of the merger on February 25, 2009. At the time, Ms. Wyskiel was a Managing Director of an affiliate of Maverick Capital, Ltd.
- (4) Whitebox Multi-Strategy Partners, L.P. and Whitebox Credit Arbitrage Partners, L.P. (collectively, the Whitebox Entities) are managed by Whitebox Advisors, LLC, the Whitebox Entities' investment manager. Andrew Redleaf in his capacity as the managing member of Whitebox Advisors, LLC has sole voting control and investment discretion of the shares. Each of the Whitebox Entities, Whitebox Advisors, LLC and Andrew Redleaf disclaims beneficial ownership of the stock except to the extent of any indirect pecuniary interest therein. The address of the Whitebox Entities, Whitebox Advisors, LLC and Andrew Redleaf is 3033 Excelsior Blvd., Suite 300, Minneapolis, Minnesota 55416. The 167,241 aggregate shares of common stock issuable upon the exercise of warrants to be registered on the registration statement to which this prospectus forms a part represent the only shares of common stock issuable upon the exercise of warrants held by the Whitebox Entities.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement on Form S-3 with the SEC for the securities being offered by this prospectus. This prospectus does not include all of the information contained in the registration statement. You should refer to the registration statement and its exhibits for additional information.

We are required to file annual and quarterly reports, special reports, proxy statements, and other information with the SEC. We make these documents publicly available, free of charge, on our website at www.csi360.com as soon as reasonably practicable after filing such documents with the SEC. You can read our SEC filings, including the registration statement, on the SEC's website at <http://www.sec.gov>. You also may read and copy any document we file with the SEC at its public reference facility at:

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Public Reference Room

100 F Street N.E.

Washington, DC 20549.

Please call the SEC at 1-800-732-0330 for further information on the operation of the public reference facilities.

INCORPORATION OF CERTAIN DOCUMENTS 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, and information in documents that we file later with the SEC will automatically update and supersede information in this prospectus. We incorporate by reference into this prospectus the documents listed below and any future filings made by us with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until we close this offering, including all filings made after the date of the initial registration statement and prior to the effectiveness of the registration statement. We hereby incorporate by reference the following documents:

our Annual Report on Form 10-K for the year ended June 30, 2011;

our Current Reports on Form 8-K filed on July 1, 2011, July 22, 2011, August 3, 2011, August 10, 2011 and August 29, 2011 (excluding any information furnished in such reports under Item 2.02, Item 7.01 or Item 9.01);

the description of our common stock contained in our registration statement on Form 8-A filed June 26, 2006, under the Securities Act, including any amendment or report filed for the purpose of updating such description; and

our definitive Proxy Statement on Schedule 14A filed on September 12, 2011.

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

Cardiovascular Systems, Inc.

651 Campus Drive

St. Paul, Minnesota 55112-3495

Attention: Investor Relations

Phone: (651) 259-1600

Copies of these filings are also available, without charge, through the Investors section of our website (www.csi360.com) as soon as reasonably practicable after they are filed electronically with the SEC. The information contained on our website is not a part of this prospectus.

LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon for us by Fredrikson & Byron, P.A., Minneapolis, Minnesota. Additional legal matters may be passed on for us, or any underwriters, dealers or agents, by counsel that we will name in the applicable prospectus supplement.

EXPERTS

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The financial statements and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Report on Internal Control over Financial Reporting) incorporated in this Prospectus by reference to the Annual Report on Form 10-K for the year ended June 30, 2011 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

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PROSPECTUS

CARDIOVASCULAR SYSTEMS, INC.

328,988 Shares

Common Stock

, 2011

We have not authorized any dealer, salesperson or other person to give any information or represent anything not contained in this prospectus. You must not rely on any unauthorized information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus does not offer to sell any shares in any jurisdiction where it is unlawful. Neither the delivery of this prospectus, nor any sale made hereunder, shall create any implication that the information in this prospectus is correct after the date hereof.

Table of Contents**PART II****INFORMATION NOT REQUIRED IN PROSPECTUS****Item 14. Other expenses of Issuance and Distribution.**

The following table sets forth the various expenses in connection with the sale and distribution of the securities being registered. All amounts shown are estimates, except the SEC registration fee. The registrant has agreed to pay these costs and expenses.

| | |
|---|-----------|
| Securities and Exchange Commission registration fee | \$ 283 |
| Printing and engraving expenses | 25,000 |
| Legal fees and expenses | 30,000 |
| Accounting fees and expenses | 5,000 |
| Miscellaneous | 30,000 |
| Total | \$ 90,283 |

Item 15. Indemnification of Directors and Officers.

Section 145 of the Delaware General Corporation Law provides that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, other than an action by or in the right of the corporation, by reason of the fact that the person is or was a director, officer, employee or agent of the corporation or is or was serving at the corporation's request as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses, including attorneys' fees, judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with the action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful. The power to indemnify applies to actions brought by or in the right of the corporation as well, but only to the extent of expenses, including attorneys' fees but excluding judgments, fines and amounts paid in settlement, actually and reasonably incurred by the person in connection with the defense or settlement of the action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that a court of competent jurisdiction shall determine that such indemnity is proper.

Section 145(g) of the Delaware General Corporation Law provides that a corporation shall have the power to purchase and maintain insurance on behalf of its officers, directors, employees and agents, against any liability asserted against and incurred by such persons in any such capacity.

Section 102(b)(7) of the General Corporation Law of the State of Delaware provides that a corporation may eliminate or limit the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, provided that such provision shall not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the General Corporation Law of the State of Delaware, or (iv) for any transaction from which the director derived an improper personal benefit. No such provision shall eliminate or limit the liability of a director for any act or omission occurring prior to the date when such provision becomes effective.

Our Amended and Restated Bylaws provide that we shall indemnify our directors and officers to the fullest extent permitted by the laws of the State of Delaware or any other applicable law. As permitted by our Amended and Restated Bylaws, we have additionally entered into indemnification agreements with each of our non-employee

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directors that provide for indemnification and expense advancement to the fullest extent permitted by the laws of the State of Delaware.

Our Amended and Restated Bylaws provide that we may purchase and maintain insurance policies on behalf of our directors and officers against specified liabilities for actions taken in their capacities as such, including liabilities under the Securities Act. We have obtained directors and officers liability insurance to cover liabilities our directors and officers may incur in connection with their services to the Registrant.

Item 16. Exhibits.

See Exhibit Index beginning on page II-6 of this registration statement.

Item 17. Undertakings.

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the Calculation of Registration Fee table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

Provided, however, that the undertakings set forth in paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statements or is contained in a form of prospectus filed pursuant to Rule 424(b) that is a part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by section 10(a) of the Securities Act of 1933 shall be deemed to be

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part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; or

(C) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser: (i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424; (ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant; (iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and (iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) The undersigned registrant hereby undertakes to deliver or cause to be delivered with the prospectus, to each person to whom the prospectus is sent or given, the latest annual report to security holders that is incorporated by reference in the prospectus and furnished pursuant to and meeting the requirements of Rule 14a-3 or Rule 14c-3 under the Securities Exchange Act of 1934; and, where interim financial information required to be presented by Article 3 of Regulation S-X are not set forth in the prospectus, to deliver, or cause to be delivered to each person to whom the prospectus is sent or given, the latest quarterly report that is specifically incorporated by reference in the prospectus to provide such interim financial information.

(d) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is therefore unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or

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proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933, and will be governed by the final adjudication of such issue.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement on Form S-3 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of St. Paul, State of Minnesota, on the 14th day of October, 2011.

Dated: October 14, 2011

CARDIOVASCULAR SYSTEMS, INC.

By: /s/ David L. Martin
 David L. Martin
 President and Chief Executive Officer

POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints David L. Martin and Laurence L. Betterley, and each of them singly, his or her true and lawful attorney-in-fact and agent with full power of substitution and resubstitution, for him or her and in his or her name, place, and stead, in any and all capacities, to sign any and all amendments and supplements (including post-effective amendments) to this Registration Statement on Form S-3, and any related Rule 462(b) registration statement or amendment thereto, to be filed by Cardiovascular Systems, Inc., and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or their substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities indicated on October 14, 2011:

| Signature | Title |
|---------------------------|--|
| /s/ David L. Martin | |
| David L. Martin | President, Chief Executive Officer and Director (principal executive officer) |
| /s/ Laurence L. Betterley | |
| Laurence L. Betterley | Chief Financial Officer (principal financial and accounting officer) |
| /s/ Edward Brown | |
| Edward Brown | Director |
| /s/ Brent G. Blackey | |
| Brent G. Blackey | Director |
| /s/ John H. Friedman | |
| John H. Friedman | Director |
| /s/ Geoffrey O. Hartzler | |
| Geoffrey O. Hartzler | Director |
| /s/ Augustine Lawlor | |
| Augustine Lawlor | Director |

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/s/ Glen D. Nelson

Glen D. Nelson

Director

/s/ Leslie L. Trigg

Leslie L. Trigg

Director

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EXHIBIT INDEX

The following is a list of exhibits filed as part of this registration statement.

- 4.1 Restated Certificate of Incorporation, as amended(1)
- 4.2 Amended and Restated Bylaws(2)
- 4.3 Specimen common stock certificate(2)
- 4.4 Form of Cardiovascular Systems, Inc. common stock warrant issued to former preferred stockholders.(2)
- 4.5 Registration Rights Agreement by and among Cardiovascular Systems, Inc. and certain of its stockholders, dated as of March 16, 2009(3)
- 4.6 Termination of Fourth Amended and Restated Stockholders Agreement by and among Cardiovascular Systems, Inc. and certain of its stockholders, dated as of March 16, 2009.(3)
- 5.1 Opinion of Fredrikson & Byron, P.A. relating to the Securities(4)
- 23.1 Consent of Fredrikson & Byron, P.A. (included in Exhibit 5.1)(4)
- 23.2 Consent of PricewaterhouseCoopers LLP(4)
- 24.1 Power of attorney (included on the signature page)

- (1) Previously filed with the SEC as an Exhibit to and incorporated herein by reference from the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2009.
- (2) Previously filed with the SEC as an Exhibit to and incorporated herein by reference from the Company's Current Report on Form 8-K filed on March 3, 2009.
- (3) Previously filed with the SEC as an Exhibit to and incorporated herein by reference from the Company's Current Report on Form 8-K filed on March 18, 2009.
- (4) Filed herewith.