

Cardiovascular Systems Inc  
Form SC 13D/A  
October 12, 2011

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

SCHEDULE 13D  
Under the Securities Exchange Act of 1934  
(Amendment No. 4)\*

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Cardiovascular Systems, Inc.

(Name of Issuer)

Common Stock, \$0.001 par value per share

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(Title of Class of Securities)

141619106

(CUSIP Number)

Michael R. Murphy  
Discovery Group I, LLC  
191 North Wacker Drive  
Suite 1685  
Chicago, Illinois 60606  
Telephone Number: (312) 265-9600

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(Name, Address and Telephone Number of Person  
Authorized to Receive Notices and Communications)

October 10, 2011

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(Date of Event which Requires Filing of this Statement)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition that is the subject of this Schedule 13D, and is filing this schedule because of §§240.13d-1(e), 240.13d-1(f) or 240.13d-1(g), check the following box.

Note: Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See §240.13d-7 for other parties to whom copies are to be sent.

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\*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

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CUSIP No. 141619106

1. Names of Reporting Persons.  
Discovery Equity Partners, L.P.
2. Check the Appropriate Box if a Member of a Group (See Instructions)
  - (a)
  - (b)
3. SEC Use Only
4. Source of Funds (See Instructions)  
WC
5. Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)
6. Citizenship or Place of Organization  
Illinois
  7. Sole Voting Power  
None.
  8. Shared Voting Power  
1,677,764
  9. Sole Dispositive Power  
None.
  10. Shared Dispositive Power  
1,677,764
11. Aggregate Amount Beneficially Owned by Each Reporting Person  
1,677,764
12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)
13. Percent of Class Represented by Amount in Row (11)  
9.5%
14. Type of Reporting Person (See Instructions)  
PN

Number of  
Shares  
Beneficially  
Owned by  
Each  
Reporting  
Person With

CUSIP No. 141619106

1. Names of Reporting Persons.  
Discovery Group I, LLC
2. Check the Appropriate Box if a Member of a Group (See Instructions)
  - (a)
  - (b)
3. SEC Use Only
4. Source of Funds (See Instructions)  
AF
5. Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)
6. Citizenship or Place of Organization  
Delaware
7. Sole Voting Power  
None.
8. Shared Voting Power  
1,920,123
9. Sole Dispositive Power  
None.
10. Shared Dispositive Power  
1,920,123
11. Aggregate Amount Beneficially Owned by Each Reporting Person  
1,920,123
12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)
13. Percent of Class Represented by Amount in Row (11)  
10.9%
14. Type of Reporting Person (See Instructions)  
IA

Number of  
Shares  
Beneficially  
Owned by  
Each  
Reporting  
Person With

CUSIP No. 141619106

1. Names of Reporting Persons.  
Daniel J. Donoghue
2. Check the Appropriate Box if a Member of a Group (See Instructions)
  - (a)
  - (b)
3. SEC Use Only
4. Source of Funds (See Instructions)  
AF
5. Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)
6. Citizenship or Place of Organization  
United States of America
  7. Sole Voting Power  
None.
  8. Shared Voting Power  
1,920,123
  9. Sole Dispositive Power  
None.
  10. Shared Dispositive Power  
1,920,123
11. Aggregate Amount Beneficially Owned by Each Reporting Person  
1,920,123
12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)
13. Percent of Class Represented by Amount in Row (11)  
10.9%
14. Type of Reporting Person (See Instructions)  
IN

Number of  
Shares  
Beneficially  
Owned by  
Each  
Reporting  
Person With

CUSIP No. 141619106

1. Names of Reporting Persons.  
Michael R. Murphy
2. Check the Appropriate Box if a Member of a Group (See Instructions)
  - (a)
  - (b)
3. SEC Use Only
4. Source of Funds (See Instructions)  
AF
5. Check if Disclosure of Legal Proceedings Is Required Pursuant to Items 2(d) or 2(e)
6. Citizenship or Place of Organization  
United States of America
  7. Sole Voting Power  
None.
  8. Shared Voting Power  
1,920,123
  9. Sole Dispositive Power  
None.
  10. Shared Dispositive Power  
1,920,123
11. Aggregate Amount Beneficially Owned by Each Reporting Person  
1,920,123
12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares (See Instructions)
13. Percent of Class Represented by Amount in Row (11)  
10.9%
14. Type of Reporting Person (See Instructions)  
IN

Number of  
Shares  
Beneficially  
Owned by  
Each  
Reporting  
Person With

Item 1. Security and Issuer

This Amendment No. 4 to Schedule 13D (“Amendment No. 4”) relates to the Common Stock, \$0.001 par value per share (the “Common Stock”), of Cardiovascular Systems, Inc., a Delaware corporation (the “Company”), which has its principal executive offices at 651 Campus Drive St. Paul, Minnesota 55112. This Amendment No. 4 amends and supplements, as set forth below, the information contained in items 1, 3, 5 and 6 of the Schedule 13D filed by the Reporting Persons with respect to the Company on August 17, 2011, as amended by Amendment No. 1 thereto filed by the Reporting Persons with respect to the Company on August 29, 2011, Amendment No. 2 thereto filed by the Reporting Persons with respect to the Company on September 8, 2011 and Amendment No. 3 thereto filed by the Reporting Persons with respect to the Company on October 6, 2011 (as so amended, the “Schedule 13D”). All capitalized terms used herein but not defined herein have the meanings set forth in the Schedule 13D. Except as amended by this Amendment No. 4, all information contained in the Schedule 13D is, after reasonable inquiry and to the best of the Reporting Persons’ knowledge and belief, true, complete and correct as of the date of this Amendment No. 4.

Item 3. Source and Amount of Funds or Other Consideration

Item 3 of the Schedule 13D is hereby amended to read in its entirety as follows:

The total purchase price for the 1,920,123 shares of Common Stock beneficially owned by Discovery Group and Messrs. Donoghue and Murphy as of October 11, 2011 was approximately \$24,010,323, and the total purchase price for the 1,677,764 shares of Common Stock beneficially owned by Discovery Equity Partners was approximately \$20,987,948. The source of such funds was the assets of Discovery Equity Partners and another private investment partnership (collectively, the “Partnerships”) over which Discovery Group exercises discretionary investment management authority, including proceeds of margin loans under margin loan facilities maintained in the ordinary course of business by the Partnerships with a broker on customary terms and conditions. The Partnerships are the legal owner of all of the Common Stock beneficially owned by Discovery Group and Messrs. Donoghue and Murphy.

Item 5. Interest in Securities of the Issuer

Item 5 of the Schedule 13D is hereby amended to read in its entirety as follows:

The information concerning percentages of ownership set forth below is based on 17,696,121 shares of Common Stock reported outstanding as of August 30, 2011 in the Company’s Definitive Proxy Statement on Schedule 14A, filed on September 12, 2011.

Discovery Equity Partners beneficially owns 1,677,764 shares of Common Stock as of October 11, 2011, which represents 9.5% of the outstanding Common Stock.

Discovery Group beneficially owns 1,920,123 shares of Common Stock as of October 11, 2011, which represents 10.9% of the outstanding Common Stock.

Mr. Donoghue beneficially owns 1,920,123 shares of Common Stock as of October 11, 2011, which represents 10.9% of the outstanding Common Stock.

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Mr. Murphy beneficially owns 1,920,123 shares of Common Stock as of October 11, 2011, which represents 10.9% of the outstanding Common Stock.

Discovery Group is the sole general partner of Discovery Equity Partners and has sole discretionary investment authority with respect to the other Partnership's investment in the Common Stock. Messrs. Donoghue and Murphy are the sole managing members of Discovery Group. As a consequence, Discovery Group and Messrs. Donoghue and Murphy may be deemed to share beneficial ownership of all of the shares of Common Stock owned by both of the Partnerships, while Discovery Equity Partners shares beneficial ownership with Discovery Group and Messrs. Donoghue and Murphy of only the shares of Common Stock owned by it.

The transactions in Common Stock effected by the Reporting Persons since the date of the most recent filing on Schedule 13D are set out in Exhibit 1 hereto.

No person other than the Partnerships is known to any Reporting Person to have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, any of the shares of Common Stock reported herein.

Item 6. Contracts, Arrangements, Understandings or Relationships with Respect to Securities of the Issuer

Item 6 of the Schedule 13D is hereby amended to read in its entirety as follows:

There are no contracts, arrangements, understandings or relationships (legal or otherwise) between or among any of the Reporting Persons and any other person with respect to any securities of the Company other than the governing documents of Discovery Group and the Partnerships, the margin loan facilities referred to under Item 3 of the Schedule 13D, the Joint Filing Agreements of the Reporting Persons with respect to the Schedule 13D that were included as exhibits thereto, the Joint Filing Agreement of the Reporting Persons with respect to this Amendment No. 4 included as Exhibit 2 to this Amendment No. 4, and the Powers of Attorney granted by Messrs Donoghue and Murphy with respect to reports under Section 13 of the Securities Exchange Act of 1934, as amended, which Powers of Attorney are included as Exhibit 3 and Exhibit 4, respectively, to this Amendment No. 4.

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Item 7. Material to Be Filed as Exhibits

Exhibit 1: List of transactions by Reporting Persons in the Company's Common Stock since the date of the most recent filing on Schedule 13D.

Exhibit 2: Joint Filing Agreement dated as of October 12, 2011, by and among Discovery Equity Partners; Discovery Group; Daniel J. Donoghue; and Michael R. Murphy.

Exhibit 3: Power of Attorney of Daniel J. Donoghue, dated as of April 28, 2008.

Exhibit 4: Power of Attorney of Michael R. Murphy, dated as of April 28, 2008.

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Signature

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

October 12, 2011

Date

DISCOVERY GROUP I, LLC,  
for itself and as general partner of  
DISCOVERY EQUITY PARTNERS, L.P.

By: Michael R. Murphy\*

Signature

Michael R. Murphy, Managing Member

Name/Title

Daniel J. Donoghue\*

Signature

Daniel J. Donoghue

Name/Title

Michael R. Murphy\*

Signature

Michael R. Murphy

Name/Title

\*By: /s/ Mark Buckley

Mark Buckley

Attorney-in-Fact for Daniel J. Donoghue

Attorney-in-Fact for Michael R. Murphy

Exhibit Index

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Exhibit 3 Power of Attorney of Daniel J. Donoghue, dated as of April 28, 2008.

Exhibit 4 Power of Attorney of Michael R. Murphy, dated as of April 28, 2008.