



MRI Interventions, Inc.

1,589,580 Shares of Common Stock

This prospectus supplement relates to the prospectus dated October 11, 2016, as supplemented by prospectus supplement no. 1 dated November 9, 2016, prospectus supplement no. 2 dated March 9, 2017, prospectus supplement no. 3 dated April 27, 2017, prospectus supplement no. 4 dated April 28, 2017 and prospectus supplement no. 5 dated May 9, 2017, which permits the resale of up to 821,000 outstanding shares of our common stock, and 768,580 shares of our common stock issuable upon the exercise of outstanding warrants, by the selling securityholders identified in the prospectus, as amended and supplemented from time to time. We will pay the expenses of registering the shares of our common stock, but we are not selling any shares of common stock in this offering and therefore will not receive any proceeds from this offering. We will, however, receive the exercise price of the warrants, if and when the warrants are exercised for cash by the securityholders.

This prospectus supplement is being filed to update, amend and supplement the information previously included in the prospectus with the information contained in our Current Report on Form 8-K filed with the Securities and Exchange Commission (the "SEC") on May 11, 2017 (the "8-K"). Accordingly, we have attached the 8-K to this prospectus supplement. You should read this prospectus supplement together with the prospectus, which is to be delivered with this prospectus supplement.

Our common stock is traded in the over-the-counter market and is quoted on the OTCQB Marketplace and the OTC Bulletin Board under the symbol MRIC. On May 10, 2017, the last reported sale price of our common stock was \$6.40 per share.

We are an "emerging growth company" under the federal securities laws and are subject to reduced public company reporting requirements. Investing in our common stock involves risk. See "Risk Factors" beginning on page 6 of the prospectus, as amended and supplemented by the "Risk Factors" beginning on page 22 of our Annual Report on 10-K, filed with the SEC on March 9, 2017, to read about factors you should consider before buying shares of our common stock.

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

The date of this prospectus supplement is May 11, 2017.

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

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 OR 15(d) of the
Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): May 11, 2017 (May 9, 2017)

MRI INTERVENTIONS, INC.

(Exact name of registrant as specified in its charter)

DELAWARE
(State or other jurisdiction
of incorporation)

001-34822
(Commission
File Number)

58-2394628
(I.R.S. Employer
Identification Number)

5 Musick
Irvine, Ca. 92618
(Address of principal executive offices, zip code)

(949) 900-6833
(Registrant's telephone number, including area code)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 12b-2 under the Exchange Act (17 CFR 240.12b-2).

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

(b) Resignation of Director for Any Reason Other than Disagreement with the Company.

On May 9, 2017, Andrew K. Rooke notified MRI Interventions, Inc. (the "Company") of his decision to resign as a member of the Company's Board of Directors (the "Board"), effective immediately. Having served as a director of the Company since July 2011, Mr. Rooke elected to step down from the Board voluntarily to give a new director candidate, R. John Fletcher, who has extensive public company board experience, the opportunity to serve as a member of the Board. Accordingly, Mr. Rooke's resignation was not the result of any disagreement with management, the Company or its operations, policies or practices.

In recognition of the contributions made by Mr. Rooke as a director of the Company, the Board's Compensation Committee accelerated the vesting of the option to purchase 500 shares awarded to Mr. Rooke on June 8, 2016 under the Company's Non-Employee Director Compensation Plan (the "Director Compensation Plan"). The Compensation Committee also extended the option exercise period through May 9, 2019 for this stock option, as well as for the following stock options previously awarded to Mr. Rooke under the Director Compensation Plan: (i) the purchase of 500 shares awarded on June 5, 2015; (ii) the purchase of 500 shares awarded on June 4, 2014; (iii) the purchase of 500 shares awarded on June 14, 2013; and (iv) the purchase of 1,125 shares awarded on April 13, 2012.

(d) Election of New Director.

On May 9, 2017, the Board, with the recommendation of the Corporate Governance and Nominating Committee, elected R. John Fletcher to serve as a director of the Company, effective immediately, until the 2017 annual meeting of stockholders and until his successor is duly elected and qualified or until his earlier death, resignation, disqualification or removal.

Mr. Fletcher founded Fletcher Spaght in 1983 where he leads both the consulting practice and venture capital activities, with analytical insights and creative solutions derived from his years of experience with clients, portfolio companies and the investment community. Mr. Fletcher works across Fletcher Spaght's practice groups, with a focus on healthcare. He has particular interests in devices, specifically in cardiology, cardiac surgery, and orthopedics, as well as in biopharma and healthcare IT. Prior to founding Fletcher Spaght, Mr. Fletcher was a Senior Manager at The Boston Consulting Group, advising a broad range of companies in healthcare and high technology industries. Mr. Fletcher serves on the Board of Directors of Spectranetics, Axcelis and Metabolon. He is Chairman of the Corporate Collaboration Council at the Thayer School of Engineering/Tuck School of Business at Dartmouth College and serves on the Board of Advisors of Beth Israel Deaconess Medical Center and the Whitehead Institute at MIT. Mr. Fletcher received his MBA from Southern Illinois University, and a BBA in Marketing from George Washington University. He was an Instructor for courses in international business and a PhD Candidate at the Wharton School of the University of Pennsylvania. He served as a Captain and jet pilot in the U.S. Air Force, and continues to be active in aviation.

In accordance with the Company's Director Compensation Plan, Mr. Fletcher will be entitled to receive a \$15,000 annual retainer for service as a Board member, a \$1,000 fee per Board meeting attended in person and a \$500 fee per Board meeting attended via telephone. Additionally, Mr. Fletcher will receive a supplemental annual retainer in the event he is appointed to serve as a member of a committee of the Board.

In connection with his election to the Board and pursuant to the terms of the Director Compensation Plan, Mr. Fletcher will be granted an option purchase 1,125 shares of the Company's common stock. The shares subject to such stock option will vest in equal annual installments over three years. In addition, pursuant to the Director Compensation Plan, on the day following each annual meeting of stockholders in which he is elected or is then serving as a director, Mr. Fletcher will receive an option to purchase 500 shares of the Company's common stock. Such stock options will vest on the earlier of the first anniversary of the grant date or the day immediately preceding the next annual meeting of stockholders.

The Company will also enter into its standard form of indemnification agreement with Mr. Fletcher (the “Indemnification Agreement”), upon the effectiveness of his election to the Board. The Indemnification Agreement provides, among other things, that the Company will indemnify Mr. Fletcher, under the circumstances and to the extent provided for therein, for certain expenses, including attorneys’ fees, judgments, fines and settlement amounts incurred by him in any action or proceeding arising out of his service as a director of the Company, any of subsidiary of the Company or any other company or enterprise to which the he provides services at the Company’s request. The foregoing description of the terms and conditions of the Indemnification Agreement is only a summary and is qualified in its entirety by the full text of the Indemnification Agreement, the form of which was previously filed as Exhibit 10.8 to the Company’s General Form for Registration of Securities on Form 10, as originally filed on December 28, 2011, and is incorporated herein by reference.

There are no arrangements or understandings between Mr. Fletcher and any other persons pursuant to which he was elected as a director of the Company. There are no family relationships between Mr. Fletcher and any director, executive officer, or any person nominated or chosen by the Company to become a director or executive officer. There are no related person transactions (within the meaning of Item 404(a) of Regulation S-K promulgated by the Securities and Exchange Commission) between Mr. Fletcher and the Company.

Item 7.01. Regulation FD Disclosure.

On May 11, 2017, the Company issued a press release with respect to the election of Mr. Fletcher to the Board and Mr. Rooke’s resignation therefrom. A copy of the press release is furnished herewith as Exhibit 99.1.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits.

See Exhibit Index immediately following signature page.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: May 11, 2017

MRI INTERVENTIONS, INC.

By: /s/ Harold A. Hurwitz

Harold A. Hurwitz
Chief Financial Officer

EXHIBIT INDEX

Exhibit No.	Description
10.1	Form of Indemnification Agreement, previously filed as Exhibit 10.8 to the Company's General Form for Registration of Securities on Form 10, as originally filed on December 28, 2011, and incorporated herein by reference.
99.1	Press Release dated May 11, 2017.

For Immediate Release

HEALTHCARE VETERAN JOHN FLETCHER JOINS MRI INTERVENTIONS' BOARD OF DIRECTORS

IRVINE, CA, May 11, 2017 – MRI Interventions, Inc. (OTCQB: MRIC) is pleased to announce that John Fletcher has been appointed to MRI Interventions' Board of Directors. Mr. Fletcher, founder and managing partner of Fletcher Spaght, Inc., brings more than 30 years of experience in healthcare with an emphasis in the field of medical devices. He succeeds Andrew K. Rooke, who stepped down from MRI Interventions' Board after nearly six years of exceptional service to the company.

In addition to serving as managing partner of Fletcher Spaght, Mr. Fletcher is Chairman of the Board of Spectranetics, Inc. (Nasdaq: SPNC), a medical device company focused on minimally invasive procedures in the cardiovascular system. During his 15-year tenure on the Board, Spectranetics has seen continued expansion of its therapeutic platforms and significant growth in its commercial business. Mr. Fletcher is also a member of the Board of Directors of Axcelis Technologies, Inc (Nasdaq: ACLS), and Metabolon, Inc., a health technology company.

“We are thrilled to have John join the Board of Directors,” said Frank Grillo, President and CEO of MRI Interventions, Inc. “John’s extensive experience in the medical device industry, as well as his leadership on a number of boards, both public and private, will be a great addition to our company.”

“I am pleased to join the Board of Directors of MRI Interventions,” said John Fletcher. “As the industry leader in the growing field of real-time, MRI-guided procedures, MRI Interventions is well positioned to advance patient care in the field of neurosurgery and beyond. I am looking forward to working with the team.”

Prior to founding Fletcher Spaght, Inc., Mr. Fletcher was a Senior Manager at The Boston Consulting Group. He was a PhD candidate in International Business at The Wharton School, University of Pennsylvania, during which time he also earned a Master’s Degree in International Finance from Central Michigan University. Mr. Fletcher received his Masters of Business Administration from Southern Illinois University and prior to that a Bachelor of Business Administration from George Washington University.

Mr. Rooke’s tenure as a member of MRI Interventions’ Board of Directors dates back to 2011, the third-longest period of service among currently active Board members.

“Andy Rooke has been a Board member for nearly 6 years, he is a significant shareholder of the Company, and an invaluable advisor to all of the executive team,” said Mr. Grillo. “Andy has been a great supporter of our company, and after six years of support and insight, we will miss Andy, although his advice will carry us forward for years to come.”

About MRI Interventions, Inc.

Building on the imaging power of magnetic resonance imaging (“MRI”), MRI Interventions is creating innovative platforms for performing the next generation of minimally invasive surgical procedures in the brain. The ClearPoint Neuro Navigation System, which has received 510(k) clearance and is CE marked, utilizes a hospital’s existing diagnostic or intraoperative MRI suite to enable a range of minimally invasive procedures in the brain. For more information, please visit www.mriinterventions.com.

Forward-Looking Statements

Statements herein concerning the Company’s plans, growth and strategies may include forward-looking statements within the context of the federal securities laws. Statements regarding the Company’s future events, developments and future performance, as well as management’s expectations, beliefs, plans, estimates or projections relating to the future, are forward-looking statements within the meaning of these

laws. Uncertainties and risks may cause the Company's actual results to differ materially from those expressed in or implied by forward-looking statements. Particular uncertainties and risks include those relating to: the Company's ability to obtain additional financing; estimates regarding the sufficiency of the Company's cash resources; future revenues from sales of the Company's ClearPoint Neuro Navigation System products; and the Company's ability to market, commercialize and achieve broader market acceptance for the Company's ClearPoint Neuro Navigation System products. More detailed information on these and additional factors that could affect the Company's actual results are described in the "Risk Factors" section of the Company's Annual Report on Form 10-K for the year ended December 31, 2016, which has been filed with the Securities and Exchange Commission, as well as the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2017, which has been filed with the Securities and Exchange Commission.

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