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

FORM S-8

REGISTRATION STATEMENT UNDER  
THE SECURITIES ACT OF 1933

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**MRI INTERVENTIONS, INC.**

(Exact name of registrant as specified in its charter)

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**Delaware**  
(State or other jurisdiction  
of incorporation or organization)

**58-2394628**  
(I.R.S. Employer Identification No.)

**5 Musick**  
**Irvine, California**  
(Address of principal executive offices)

**92618**  
(Zip Code)

**Second Amended and Restated 2013 Incentive Compensation Plan**

(Full title of the plans)

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**Harold A. Hurwitz**  
**Chief Financial Officer and Secretary**  
**5 Musick**  
**Irvine, California 92618**  
(Name and address of agent for service)

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**(949) 900-6833**  
(Telephone number, including area code, of agent for service)

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With copies to:  
**Richard F. Mattern, Esq.**  
**Kristin C. Dunavant, Esq.**  
**Bass, Berry & Sims PLC**  
**100 Peabody Place, Suite 1300**  
**Memphis, Tennessee 38103**  
**(901) 543-5933**

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

Large accelerated filer   
Non-accelerated filer  (Do not check if a smaller reporting company)

Accelerated filer   
Smaller reporting company   
Emerging growth company

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 7(a)(2)(B) of the Securities Act.

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### CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered <sup>(1)</sup>	Proposed maximum offering price per share	Proposed maximum aggregate offering price	Amount of registration fee
Common Stock, \$0.01 par value per share	1,800,000 shares <sup>(2)</sup>	\$2.32 <sup>(3)</sup>	\$4,176,000	\$519.91

- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional shares of common stock, \$0.01 par value (the "Common Stock"), which become issuable under the MRI Interventions, Inc. Second Amended and Restated 2013 Incentive Compensation Plan (the "Amended 2013 Plan") by reason of any stock dividend, stock split, recapitalization or any other similar transaction effected without receipt of consideration which results in an increase in the number of the Registrant's outstanding shares of Common Stock.
- (2) Represents an additional 1,800,000 shares of Common Stock of the Registrant issuable under the Amended 2013 Plan.
- (3) Estimated solely for the purpose of calculating the registration fee pursuant to Rules 457(c) and 457(h) under the Securities Act, based on the average of the high and low sales prices of the Common Stock as reported on OTC Markets on September 29, 2017, which was \$2.32 per share.

## **REGISTRATION OF ADDITIONAL SECURITIES**

This Registration Statement relates solely to the registration of additional securities of the same class as other securities for which a registration statement on this form relating to an employee benefit plan is effective. Pursuant to General Instruction E of Form S-8, this Registration Statement hereby incorporates by reference the contents of (i) the registration statement on Form S-8 filed by the Registrant with the Securities and Exchange Commission (the "Commission") on October 25, 2013 (Registration No. 333-191908), and (ii) the registration statement on Form S-8 filed by the Registrant with the Commission on August 17, 2015 (Registration No. 333-206432), with respect to the MRI Interventions, Inc. 2013 Incentive Compensation Plan, as amended and restated.

## PART I

### INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

Documents containing information required by Part I of this Registration Statement will be sent or given to employees, officers, directors or others as specified by Rule 428(b)(1) under the Securities Act. In accordance with the rules and regulations of the Commission and the Note to Part I of Form S-8, such documents are not filed with the Commission either as a part of this Registration Statement or as prospectuses or prospectus supplements.

## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

#### Item 3. Incorporation of Documents by Reference.

The following documents, which have been filed by the Registrant with the Commission, are incorporated by reference into this Registration Statement:

- The Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 filed on March 9, 2017, as amended by Amendment No.1 on Form 10-K/A to the Registrant's Annual Report for the year ended December 31, 2016 filed on April 28, 2017;
- The Registrant's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2017 filed on May 9, 2017 and the Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2017 filed on August 11, 2017;
- The Registrant's Current Reports on Form 8-K filed on July 26, 2016, April 27, 2017, May 11, 2017, May 25, 2017, May 30, 2017, August 18, 2017 and October 3, 2017, respectively; and
- The description of the Registrant's Common Stock contained in the Registrant's Registration Statement on Form 10 (File No. 000-54575) filed on December 28, 2011, including any subsequent amendment or any report filed for the purpose of updating such description.

All documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), prior to the filing of a post-effective amendment to this Registration Statement which indicates that all of the shares of common stock offered have been sold or which deregisters all of such shares then remaining unsold, shall be deemed to be incorporated by reference in this Registration Statement and to be part hereof from the date of the filing of such documents; except as to any portion of any future annual or quarterly report to stockholders or document or current report furnished under current items 2.02 or 7.01 of Form 8-K that is not deemed filed under such provisions. For the purposes of this Registration Statement, any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Under no circumstances will any information furnished under current items 2.02 or 7.01 of Form 8-K be deemed incorporated herein by reference unless such Current Report on Form 8-K expressly provides to the contrary.

## Item 8. Exhibits.

The exhibits listed below are filed as part of or incorporated into this Registration Statement.

<u>Exhibit No.</u>	<u>Description</u>
3.1	Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on May 11, 2012 and incorporated herein by reference).
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on June 8, 2015).
3.3	Certificate of Amendment to the Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on July 26, 2016).
3.4	Amended and Restated Bylaws (filed as Exhibit 3.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on May 11, 2012 and incorporated herein by reference).
4.1	Reference is made to Exhibits 3.1, 3.2, 3.3 and 3.4.
4.2	Specimen of Common Stock Certificate (filed as Exhibit 4.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on November 14, 2014 and incorporated herein by reference).
4.3	Second Amended and Restated 2013 Incentive Compensation Plan (filed as Appendix A to the Registrant's Definitive Proxy Statement on Schedule 14A filed with the Securities and Exchange Commission on September 5, 2017 and incorporated herein by reference).
5.1*	Opinion of Bass, Berry & Sims PLC
23.1*	Consent of Bass, Berry & Sims PLC (included in Exhibit 5.1)
23.2*	Consent of Cherry Bekaert LLP
24.1*	Power of attorney (included on signature page)

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\* Filed herewith.

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Irvine, state of California, on this 3rd day of October, 2017.

MRI INTERVENTIONS, INC.

By: /s/ Harold A. Hurwitz  
Harold A. Hurwitz  
Chief Financial Officer and Secretary

## POWER OF ATTORNEY

The undersigned directors and officers do hereby constitute and appoint Francis P. Grillo and Harold A. Hurwitz and each of them, with full power of substitution, our true and lawful attorneys-in-fact and agents to do any and all acts and things in our name and behalf in our capacities as directors and officers, and to execute any and all instruments for us and in our names in the capacities indicated below, that such person may deem necessary or advisable to enable the registrant to comply with the Securities Act and any rules, regulations and requirements of the SEC in connection with this registration statement, including specifically, but not limited to, power and authority to sign for us, or any of us, in the capacities indicated below, any and all amendments hereto (including pre-effective and post-effective amendments or any other registration statement filed pursuant to the provisions of Rule 462(b) under the Securities Act); and we do hereby ratify and confirm all that such person or persons shall do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the date indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Francis P. Grillo</u> Francis P. Grillo	Chief Executive Officer and Director (Principal Executive Officer)	October 3, 2017
<u>/s/ Harold A. Hurwitz</u> Harold A. Hurwitz	Chief Financial Officer (Principal Financial and Accounting Officer)	October 3, 2017
<u>/s/ Kimble L. Jenkins</u> Kimble L. Jenkins	Chairman of the Board of Directors	October 3, 2017
<u>/s/ R. John Fletcher</u> R. John Fletcher	Director	October 3, 2017
<u>/s/ Pascal E.R. Girin</u> Pascal E.R. Girin	Director	October 3, 2017
<u>/s/ Timothy T. Richards</u> Timothy T. Richards	Director	October 3, 2017
<u>/s/ John N. Spencer, Jr.</u> John N. Spencer, Jr.	Director	October 3, 2017
<u>/s/ Maria Sainz</u> Maria Sainz	Director	October 3, 2017

**BASS BERRY + SIMS**

The Tower at Peabody Place  
100 Peabody Place, Suite 1300  
Memphis, Tennessee 38103  
(901) 543-5900

October 3, 2017

Board of Directors  
MRI Interventions, Inc.  
5 Musick  
Irvine, California 92618

Re: Registration Statement on Form S-8

Ladies and Gentlemen:

We have acted as counsel to MRI Interventions, Inc., a Delaware corporation (the "Company"), in connection with the preparation and filing of a Registration Statement on Form S-8 (the "Registration Statement") relating to an additional 1,800,000 shares of Company's common stock, par value \$0.01 per share (the "Common Stock"), available for issuance pursuant to the MRI Interventions, Inc. Second Amended and Restated 2013 Incentive Compensation Plan (the "Plan").

In connection with this opinion, we have examined and relied upon such records, documents, certificates, and other instruments as we have deemed necessary or appropriate in order to express the opinions hereinafter set forth. We have also assumed the legal capacity of all natural persons, the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as copies, the authenticity of the originals of such latter documents, the legal competence of all signatories to such documents, and, except to the extent we express an opinion as to due authorization in the next paragraph of this letter, the due authorization, execution and delivery of all documents by the parties thereto. As to various questions of fact relevant to the opinion expressed herein, we have relied upon, and assume the accuracy of, certificates and oral or written statements and other information of or from public officials and officers and representatives of the Company.

Based upon and subject to the qualifications, assumptions and limitations set forth herein, we are of the opinion that:

- (a) The Company is a corporation duly incorporated and existing under and by virtue of the laws of the State of Delaware and in good standing with the Secretary of State of the State of Delaware; and
- (b) The shares of Common Stock issuable in connection with the Plan have been duly authorized and, when issued in accordance with the terms of the Plan, will be validly issued, fully paid and non-assessable.

The opinions expressed above are limited to the General Corporation Law of the State of Delaware (which includes applicable provisions of the Delaware Constitution and reported judicial decisions interpreting the General Corporation Law of the State of Delaware and the Delaware Constitution).

We hereby consent to the filing of this opinion with the Securities and Exchange Commission (the "Commission") as Exhibit 5.1 to the Registration Statement. In giving this consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act of 1933, as amended, or the rules and regulations of the Commission.

This opinion is limited to the specific issues addressed herein, and no opinion may be inferred or implied beyond that expressly stated herein.

This opinion is furnished to you in connection with the filing of the Registration Statement. Our opinion is rendered as of the date hereof, and we assume no obligation to advise you of changes in law or fact (or the effect thereof on the opinions expressed herein) that hereafter may come to our attention.

Sincerely,

/s/ Bass, Berry & Sims PLC

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

MRI Interventions, Inc.  
Irvine, California

We consent to the incorporation by reference in this Registration Statement on Form S-8 of MRI Interventions, Inc. of our report dated March 9, 2017, appearing in the Annual Report on Form 10-K of MRI Interventions, Inc. as of and for the year ended December 31, 2016, filed March 9, 2017 with the U.S. Securities and Exchange Commission.

/s/ Cherry Bekaert LLP

Charlotte, North Carolina  
October 3, 2017