February 8, 2012

Amanda Ravitz
Aslynn Hogue
Dennis Hult
Jay Webb
Division of Corporation Finance
United States Securities and Exchange Commission
450 Fifth Street, N.W., Mail Stop 3030
Washington, DC 20549

Re: MRI Interventions, Inc. (the "*Company*")
Registration Statement on Form 10 Filed December 28, 2011
File No. 000-54575

Ms. Ravitz, Ms. Hogue, Mr. Hult and Mr. Webb:

We have enclosed for electronic filing via EDGAR pursuant to the Securities Exchange Act of 1934, as amended (the "***Exchange Act***"), Amendment No. 1 ("***Amendment No. 1***") to the Company's Registration Statement on Form 10 (the "***Registration Statement***") originally filed with the Securities and Exchange Commission (the "***Commission***") on December 28, 2011 (the "***Original Filing***"). The copy of Amendment No. 1 that is enclosed with the hard copy of this letter is marked to show changes from the Original Filing.

Amendment No. 1 is being filed in response to comments received from the staff of the Commission's Division of Corporation Finance (the "***Staff***") by letter dated January 24, 2012 to Kimble L. Jenkins (the "***Comment Letter***") with respect to the Original Filing. The numbering of the paragraphs below corresponds to the numbering in the Comment Letter, the text of which we have incorporated in bold italics into this response letter for convenience. Page references in the text of our responses correspond to the page numbers of Amendment No. 1.

We have sent to your attention on February 8, 2012 courtesy copies of this letter, various supplemental materials and Amendment No. 1 (excluding exhibits) blacklined to show changes against the Original Filing.

General

1. Please note that this filing will become effective automatically 60 days after the date you initially filed it. If this filing was made voluntarily, you should consider withdrawing

it prior to the effective date if comments remain outstanding. You could then refile when you are prepared to resolve the comments. Please tell us whether you intend to file a request for withdrawal before the automatic effectiveness date of this registration statement if comments remain outstanding.

The Company acknowledges the Staff's comment. The Company supplementally advises the Staff that the Company does not intend to file a request for withdrawal before the automatic effective date of the Registration Statement, if comments remain outstanding. The Company understands that the Registration Statement is effective as of February 27, 2012, and the Company will be subject to the reporting requirements under Section 13(a) of the Exchange Act upon effectiveness.

2. Consideration should be given on an ongoing basis to the updating requirements of Rule 8-08 of Regulation S-X.

The Company acknowledges the Staff's comment and supplementally advises the Staff that the Company will give consideration, on an ongoing basis, to the updating requirements of Rule 8-08 of Regulation S-X.

Explanatory Note

3. We note your disclosure in the last paragraph of market data and other statistical information provided in the registration statement. Please provide us with copies of the sources of this data, clearly marking the relevant sections of the reports that support the data you have included in your disclosure.

Contemporaneously with the filing of Amendment No. 1, the Company is supplementally providing the Staff copies of third-party data relied upon for certain statements the Company makes in the Registration Statement (collectively, the "***Supporting Materials***"). The Supporting Materials have been enclosed for the Staff's review on a supplemental basis in a separate binder. The portions that support the Company's disclosure are clearly indicated for your convenience. Pursuant to Rule 24b-2 under the Exchange Act, the Supporting Materials are being provided to the Staff on a supplemental basis only and are not to be deemed filed with or deemed part of the Registration Statement. Pursuant to Rule 24b-2, we request that the Supporting Materials be returned to the Company upon completion of your review thereof. Please call us when you have completed your review, and we will arrange for the Supporting Materials to be picked up from you.

Item 1. Business, page 3

4. Since your ClearTrace System has not been approved for commercialization, please revise throughout to qualify statements about its use, capabilities and results as anticipatory in nature.

The Company has revised the disclosure throughout Amendment No. 1 to qualify statements about the use, capabilities and results of the ClearTrace system as anticipatory in nature.

5. Please revise to remove disclosure related to Siemens' market position, or provide us information about the measure of leadership and why the disclosure enhances an investor's understanding of your business.

The Company has revised the disclosure on pages 4 and 10 to remove the references to Siemens' market position.

6. We note your disclosure on page 9 and elsewhere that your ClearPoint System is not FDA approved for use in specific neurological procedures. If you are not presently seeking to have such indications included in your 510(k) clearance, please revise your disclosure to more clearly explain why a discussion of these procedures and the health conditions addressed thereby enhances an investor's understanding of your business.

The Company has revised the disclosure on page 9 to more clearly explain why a discussion of the specific neurological procedures enhances an investor's understanding of the Company's business. As reflected in the revised disclosure, just like conventional stereotaxy-based systems, the Company's ClearPoint system has a general indication for use. The indication for use does not reference specific neurological procedures. The Company markets its ClearPoint system to physicians consistent with the FDA-cleared indication for use. For example, the Company markets its ClearPoint system to physicians generally for the *insertion of electrodes*, instead of specifically for the *insertion of DBS electrodes*. However, a physician may choose to use a medical device for a purpose that is not included in the wording of the FDA-cleared indication for use. Today, physicians use other conventional stereotaxy-based systems for specific neurological procedures. The Company expects the same will be true for its ClearPoint system. Therefore, the Company believes the discussion of the specific neurological procedures in the Registration Statement helps an investor better understand how the Company expects physicians will use the ClearPoint system.

Regulatory Status, page 12

7. Please provide an anticipated timeline for submission of your ClearTrace product for regulatory approval, or indicate that you are not able to estimate the time.

The Company has revised the disclosure on page 12 to indicate that the Company is not able, at this time, to estimate when the Company will make a regulatory filing seeking clearance or approval of the ClearTrace system.

Boston Scientific, page 14

8. We note your disclosure in the first paragraph on page F-47 regarding potential payments to Boston Scientific Corporation in the event that specified milestones are not achieved by December 31, 2012 and your disclosure in the last paragraph on page F-53 regarding the one-time option to terminate the BSC Cardiac Agreement. Please revise this section as appropriate to discuss the material terms of your license and development agreements. Please also consider risk factor disclosure, to the extent these represent material risks.

The Company has revised the disclosure on pages 14 and 15 to more fully describe the material terms of its license and development agreements with Boston Scientific. The Company supplementally advises the Staff that the Company considered the risks associated with those license and development agreements and concluded that the terms of the agreements do not represent a material risk to the Company, other than as reflected in the existing risk factor on page 40 and the new risk factor on page 43 (which was added as a result of the recent amendment described below in response to Comment 12).

Sales and Marketing, page 16

9. We note that your revenue model is focused on high margin disposable components. Please address here or elsewhere as appropriate whether you believe your disposable components are sufficiently protected by existing intellectual property rights.

The Company has revised the disclosure on page 16 to indicate its belief that the Company's intellectual property rights in its disposable products, coupled with the tight integration of the ClearPoint reusable and disposable products, are sufficient to protect the Company's interests.

Item 1A. Risk Factors, page 31

We will need additional funding …. page 40

10. Please revise this risk factor to quantify the "substantial future capital" you anticipate that you will require for your business.

The Company has revised the disclosure on page 40 to quantify the substantial future capital that the Company will require for its business.

Management's Discussion and Analysis … page 55

11. We note your disclosure in the first paragraph on page F-36 regarding your prior intellectual property litigation and legal settlement. Consider disclosure in this section to the extent the proceeding or settlement represents one of the primary drivers of material changes to your selling, general, and administrative expenses or cash flows for the periods disclosed and to the extent that the legal settlement represents a known, material demand or commitment that will result in or that is reasonably likely to result in your liquidity decreasing in any material way.

The Company has revised the disclosure on page 61 to include the impact of the legal settlement in the explanation of the primary drivers of material changes in selling, general, and administrative expenses for the year ended December 31, 2010 compared to the year ended December 31, 2009. The Company supplementally advises the Staff that cash flows for 2010 were not impacted as no amounts related to the settlement were paid until 2011. All amounts related to the settlement are reflected in current other accrued liabilities at December 31, 2010.

Liquidity and Capital Resources, page 62

12. We note your disclosure in the second paragraph of this section that the maturity dates of your Boston Scientific loans have been extended through January 16, 2012 and that you are in the process of negotiating a longer term extension. Please revise to update your disclosure regarding the status of these loans and the present outstanding amount.

The Company supplementally advises the Staff that the Company and Boston Scientific entered into a definitive loan amendment on February 7, 2012, although the effective date of the amendment is February 2, 2012. The Company has updated the disclosure on page 62 to reflect the present status of its loans with Boston Scientific and the present outstanding amount. In addition, the Company has revised the disclosure on pages 18, 62, 88, F-37 and F-61 to reflect the loan amendment transaction. Likewise, the Company has added a new risk factor on page 43. Finally, as a result of the loan amendment, the Company has reclassified the principal and accrued interest under the Boston Scientific loans from current liabilities to long-term liabilities.

13. We note your disclosure in the third paragraph of this section of 10% senior unsecured convertible notes in the aggregate principal amount of $4.1 million. We also note your disclosure that holders of $3.4 million in principal amount of the notes have amended their notes. Please revise to clarify the status of the remaining $0.7 million in principal amount of these notes.

The Company has revised the disclosure on page 62 to clarify the status of the remaining $0.7 million in principal amount of the notes.

14. For each convertible instrument, please indicate the number of shares the holder would receive if conversion occurred today.

The Company has revised the disclosure on pages 62 and 63 to indicate the number of shares the applicable holder would have received if the conversion had occurred on January 31, 2012.

Item 5. Directors and Executive Officers, page 68

15. Please tell us whether any of your directors were elected or appointed based on an arrangement or understanding between you and the director or any other person. We note, in this regard, your disclosure in the first paragraph on page F-52 that an affiliate of Boston Scientific Corporation is a stockholder and has a representative on your board of directors. We also note your disclosure of a Stockholders' Agreement in Amendment No. 14 to your Form S-1 filed on August 17, 2010, such as on pages 91-92 and in Exhibit 3.6.

The Company supplementally advises the Staff that none of its directors were elected or appointed based on an arrangement or understanding between the Company and the director or any other person. The above-referenced Stockholders' Agreement did pertain to the composition of the Company's Board of Directors. However, the Company supplementally advises the Staff that such Stockholders' Agreement has been terminated and is no longer in effect.

Base Salary, page 74

16. Please revise your disclosure in the first paragraph on page 75 to provide additional discussion of the voluntary reductions in salary for your named executive officers. For example, please discuss the amount and duration of the temporary reductions for each named executive officer.

The Company has revised the disclosure in "Item 6. Executive Compensation" on pages 71 through 85 to refer to and describe the Company's 2011 compensation. The Company has also expanded its disclosure of the continuation of the voluntary reductions in salary for certain of its named executive officers to indicate that the salary reductions continued throughout 2011 and to indicate the amount of the temporary reductions.

Long-Term Equity Compensation, page 75

17. Please revise the first paragraph on page 76 to describe the factors of individual performance considered by your compensation committee in determining stock option award amounts for your named executive officers for fiscal 2010.

The Company has revised the disclosure in "Item 6. Executive Compensation" on pages 71 through 85 to refer to and describe the Company's 2011 compensation. As disclosed on page 75, no long-term equity compensation was granted to the Company's named executive officers in 2011.

Equity Compensation Plan Information, page 88

18. Please revise as appropriate to describe briefly the material features of each equity compensation plan that was adopted without the approval of security holders or to clarify which of your equity compensation plans discussed elsewhere, such as on pages 81 to 84, were adopted without the approval of security holders.

The Company has revised the disclosure on page 88 to indicate that the only equity compensation plan not approved by the Company's stockholders is the 2010 Non-Qualified Stock Option Plan (the "***NQSO Plan***"). The revised disclosure further indicates that the only type of award permitted under the NQSO Plan is a non-qualified stock option and that the Company will cease to make any additional awards under the NQSO Plan upon the effectiveness of the Company's 2012 Incentive Compensation Plan, which has be submitted to the Company's stockholders for approval.

Item 10. Recent Sales of Unregistered Securities, page 88

19. Please identify the purchasers or types of purchasers in the sale discussed in paragraph number 8.

The Company has revised the disclosure on pages 89 and 90 to indicate that the Company is offering securities only to accredited investors and that, as of January 31, 2012, 26 accredited investors had purchased units.

Audited Financial Statements as of December 31, 2010 and 2009 and for the years ended December 31, 2010, 2009, and 2008, page F-1

Notes to Financial Statements, page F-8

2. Summary of Significant Accounting Policies, page F-8

Revenue Recognition, page F-12

20. We noted from disclosures herein that your ClearPoint system consists of reusable equipment and software. Please tell us and revise this note to disclose how your revenue recognition accounting policy reflects the fact your products sold include software. Your response should include specific references to the authoritative U.S. GAAP that you followed when accounting for sales of products that include software. Also, tell us whether you have any post-shipment obligations due to the fact certain of your product include software and discuss the accounting implications of any such obligations. For example, tell us if your customers have software upgrade rights.

The Company has revised the disclosure on page F-12 to clarify that the software included in the ClearPoint system reusable components is incidental to the utility of the ClearPoint system as a whole. As such, the Company has disclosed that the provisions of ASC 985-605, Software Revenue Recognition, are not applicable. Corresponding revisions have been made to the disclosure on page F-46 and page 57 ("Management's Discussion and Analysis of Financial Condition and Results of Operations–Critical Accounting Policies and Significant Judgments and Estimates").

With respect to software upgrade rights, the Company supplementally advises the Staff that the Company sold ClearPoint system reusable components to one customer where the Company agreed that **if** the Company develops a software upgrade during the two-year period following the sale, the Company will make the upgrade available to that customer at no additional charge. The Company estimated the relative selling price of this extended support agreement based on the Company's list price for such a support agreement, less an estimated discount, and the Company deferred that amount ($12,000). The Company is recognizing that amount ratably over the two-year period. The Company had not sold any separate support agreements as of September 30, 2011. Due to the immaterial amount, the Company did not disclose this treatment separately, but the Company will update its revenue recognition policy if this type of transaction becomes more significant. As of September 30, 2011, the Company had sold ClearPoint system reusable components to two additional customers, neither of which have the right to receive software upgrades.

As requested in the Comment Letter, the Company acknowledges that:

- the Company is responsible for the adequacy and accuracy of the disclosure in the Company's filing;
- Staff comments or changes to disclosure in response to Staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the Company may not assert Staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

We would very much appreciate the Staff's prompt review of Amendment No. 1. Should you have any additional questions, please call me at (901) 522-9344 or our counsel, Rob DelPriore, at (901) 577-8228.

Very truly yours,

MRI Interventions, Inc.

/s/ Oscar L. Thomas
Oscar L. Thomas
Vice President, Business Affairs

cc: Kim Jenkins
Robert J. DelPriore