

June 27, 2005

David J. Drachman
President and Chief Executive Officer
AtriCure, Inc.
6033 Schumacher Park Drive
West Chester, Ohio 45069

Re: AtriCure, Inc.
Amendment No. 1 to Registration Statement on Form S-1
Filed June 14, 2005
File No. 333-124197

Dear Mr. Drachman:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation.

In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter

Summary, page 1

1. We note your response to and supplemental materials provided in connection with your response to comment 7. Please revise to disclose the extent to which the studies you cite to support your statements of efficacy, safety and reliability were conducted by and/or authored by professionals who serve as consultants to your company. Provide similar disclosure in the business section where these studies are discussed. On page 66, describe the material terms of the consulting agreements, and quantify the compensation paid to the consultants who participated in the studies you refer to in this filing, along with any equity interest they hold in the registrant. We note on pages 2, 49, and elsewhere, you refer to "independent" studies. It does not appear appropriate to characterize the studies as such, given the participation of your consultants who have received cash and/or stock from the registrant. Please revise or advise.

Our Solution, page 2

2. Where you refer to clinical studies throughout the prospectus, state the number of patients that were included in the study.

3. Reconcile the disclosure under the third bullet with the risk factor at the top of page 14.

Results of Operations, page

Liquidity and Capital Resources, page 42

4. We note your reference on page 42 and F-22 to an appraisal performed by an independent party for the warrants issued in connection with the credit facility. Reference to an independent valuation expert is not required, however, when this reference is made the expert should be named and their consent included in the amendment. Alternatively, you could remove this reference and disclose details of the methodology and assumptions you used to determine this value. Please revise. This should also be addressed for the reference on page F-47.

5. Please update your contractual obligations table to March 31, 2005, the date of your most recent balance sheet. Please also revise your contractual obligations table to include the minimum amounts due under the development agreement with Stellartech Research Corporation.

Regulatory Clearances, page 53

6. We note that the FDA found "significant deficiencies" in your prior submissions to obtain 510(k) clearance. Please expand to more specifically identify the nature of the significant deficiencies and the steps you have taken to correct them.

Manufacturing, page 64

7. We note the disclosure added in response to comment 35. Please revise to quantify the purchase requirements and indemnification obligations.

Principal and Selling Shareholders, page 78

8. Tell us whether the selling stockholders are broker-dealers or affiliates of a broker-dealer. Any selling stockholders who are broker-dealers must be identified as underwriters with respect to the shares that they are offering for resale. In addition, each selling stockholder who is an affiliate of a broker-dealer must be identified as an underwriter with respect to the shares that it is offering for resale unless that selling stockholder is able to make the following representations in the prospectus:
* The selling stockholder purchased the shares being registered for resale in the ordinary course of business, and
* At the time of the purchase, the selling stockholder had no agreements or understandings, directly or indirectly, with any person to distribute the securities.
Please revise your disclosure accordingly.

Certain Relationships and Related Party Transactions, page 81

9. State the amount paid by the registrant for the rights it received pursuant to the technology transfer agreement.

10. We note your response to comment 39. We may have further comment once the agreements with Enable have been filed.

Consolidated Financial Statements of AtriCure, Inc. for the year ended December 31, 2004

Note 1. Summary of Significant Accounting Policies, page F-7

11. We note your response to prior comment 47 in our letter dated May 12, 2005 and the revised disclosure. Please further revise your footnotes to disclose the specific terms and conditions of your product sales to support your revenue recognition practice, similar to your response.

Property and Equipment, page F-7

12. Refer to your response to prior comment 48 in our letter dated May 12, 2005. You state that the useful life of cryo-units and generators that are loaned to medical providers is three years. You also indicate that a customer retains the loaned equipment for an indefinite period of time. Tell us how long the customer usually possesses the equipment and whether you reuse the equipment after it is returned. In addition, revise the footnotes to clarify your basis for depreciating the loaned equipment to cost of sales over a three-year period.

Note 2. Stock Option Plan, page F-9

13. We note your response to our prior comments 50 and 53 in our letter dated May 12, 2005. We continue to defer any evaluation of stock compensation until the estimated offering price is specified. Once the offering price is determined, please update your MD&A to disclose the aggregate intrinsic value of all options based upon the midpoint of the estimated IPO range and to discuss each significant factor contributing to the difference between the fair value as of the date of grant and the estimated IPO price. We may have further comments when you file the amendment containing that information.

14. We see your response to prior comment 51 in our letter dated May 12, 2005 that you used information provided by investment bankers to determine the fair value of your stock. Please tell us whether the investment bankers or your underwriters have provided you with preliminary range of the offering price for your stock in your discussions with them.

15. We see your response to prior comment 52 in our letter dated May 12, 2005. However, we do not see where you have disclosed the method you used to determine the fair value of options granted, whether the valuation was contemporaneous or retrospective, or that the valuation specialist was a related party. It appears from your response that the valuation was performed by a related party, specifically a board member of AtriCure. Please revise accordingly.

16. We note your response to prior comment 54 in our letter dated May 12, 2005 and Exhibit D submitted with your response to comment 51. The fair value of the options granted included in Exhibit D do not agree with the disclosures on page F-10 of your financial statements. Please advise. Additionally, please tell us and disclose the basis for reducing the fair value by 20% to reflect the illiquidity of the options, including how the illiquidity percentage was determined.

Note 4. Redeemable Preferred Stock, page F-12

17. We see your response to prior comment 56 in our letter dated May 12, 2005. Please revise Note 4 to disclose the anticipated future accounting for the accrued 15% rate upon completion of the contemplated IPO. As a related matter, please tell us why it is appropriate to accrue the 15% rate as interest expense.

Consolidated Financial Statements of Enable Medical Corporation, Inc.
for the year ended December 31, 2004

Note 1. Prepaid Legal Costs, page F-21

18. Revise to provide your accounting policy relating to prepaid legal costs. Tell us more about the nature of these costs.

Note 2. Stock Option Plan, page F-31

19. We note your response to prior comment 59 in our letter dated May 12, 2005. Please revise your footnote to disclose details of the assumptions, estimates and valuation methodology you used to determine the fair value of options granted. We see your disclosure of how the exercise price was determined. Additionally, your response indicates that the fair value of Enable was determined to be \$0.60 per share. Please reconcile this value to the table on page F-31 of the financial statements. In addition, provide more details of the basis for the 25% illiquidity discount and how this was determined.

Unaudited Pro Forma Combined Financial Information as of and for the year ended December 31, 2004

Note 1. Description of Transactions and Basis of Presentation, page F-47

20. Refer to your response to prior comment 63 in our letter dated May 12, 2005. Please revise your footnote to describe the factors that contributed to a purchase price resulting in the recognition of significant amounts of goodwill.

21. Additionally, we note your reference to an appraisal performed by an independent party on page F-48. Reference to an independent valuation expert is not required, however, when this reference is made the expert should be named and their consent included in the amendment. Alternatively, you could remove this reference and disclose details of the methodology and assumptions you used to determine this value. Please revise.

Note 2. Adjustments to the Unaudited Pro Formal Condensed Combined Balance Sheet, page F-48

22. Tell us why you are reducing cash by \$6.5 million in footnote (a). We note that the additional amount due to Enable, if consummated prior to July 1, 2005, will be \$6.0 million since \$0.5 million was already paid in February 2005.

Note 3. Adjustments to the Unaudited Pro Forma Condensed Combined Statements of Operations, page F-49

23. Revise to disclose more details of the nature of the proprietary manufacturing technology and clarify the significant estimates, assumptions and methodologies used to value this asset.

24. We see your response to prior comment 65 in our letter dated May 12, 2005 and the related revised disclosures. Please clarify the statement made on page F-49 that "the net effect of these entries is to leave the entire profit of Enable in the audited pro forma condensed combined statement of operations." The nature and effect of these entries is not clear.

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As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

You may contact Kristin Lochhead at (202) 551-3664 or Brian Cascio, Accounting Branch Chief, at (202) 551-3676 if you have questions regarding comments on the financial statements and related matters. Please contact Mary Beth Breslin at (202) 551-3625 or me at (202) 551-3800 with any other questions.

Sincerely,

Peggy A. Fisher

Assistant Director

cc (via fax): Theodore L. Polin, Esq.
Alan D. Schnitzer, Esq.

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David J. Drachman
AtriCure, Inc.
June 27, 2005
Page 1