May 12, 2005

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

Re: AtriCure, Inc.
Registration Statement on Form S-1
Filed April 20, 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 supplemental information so we may better understand your disclosure.
After reviewing this information, we may or may not 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 on any other aspect
of our review. Feel free to call us at the telephone numbers listed
at the end of this letter.

1. Please confirm that any preliminary prospectus you circulate will
include all non-Rule 430A information. This includes the price range
and related information based on a bona fide estimate of the public
offering price within that range, and other information that was left
blank throughout the document. Also note that we may have additional
comments after you file this information.
2. Please note that we will also have comments when you complete the
numerous blanks thoroughout the filing that are not price related.

Cover Page
3. In order to comply with the staff`s long standing position, please
remove the language designating UBS Investment Bank and Piper Jaffray
as "joint book-running managers."

Summary - Page 1
4. Expand the first paragraph to provide more detailed and specific
information regarding the current status of FDA approval, including
the steps you need to take before you can obtain FDA approval and an
estimate of how long it may take before you receive FDA approval for
the treatment of AF. Define the term "off-label" use.
5. In the second paragraph where you use the term "full commercial
release," expand to explain the current FDA-approved uses of your

product and the extent to which your product is so used.
6. We note your substantial disclosure here and in the Business section describing the market opportunity for the use of your product in the treatment of atrial fibrillation. Reconcile this disclosure with the fact that your product has not been approved by the FDA for the treatment of atrial fibrillation and you are not permitted to market your product for such use until you have received approval from the FDA. Revise to discuss the restrictions on your ability to market or promote your system for off-label uses and to train physicians to use your system for ablation of cardiac tissue or the surgical treatment of AF, and limit appropriately your discussion of the market opportunity for the use of your product to treat atrial fibrillation.
7. Please revise your disclosure, here and in the business section, to state briefly the basis for your beliefs that:
* Your system is "safe, rapid, and reliable," and that surgeons have used your system "to safely, rapidly and reliably" create transmural lesions, particularly considering your adverse event disclosure on pages 52 - 53 and your disclosure on page 8 that limited clinical data is available relating to the safety and effectiveness of your system,
* Your system "reduces the risk of blood clots, strokes and damage to adjacent anatomical structures," and
* "Leading cardiothoracic surgeons have widely adopted" your system as a "standard treatment alternative" for atrial fibrillation.
Also supplementally provide support for these findings. Please clearly mark the supporting statements. Specifically identify any professionals with whom you have entered into consulting agreements if they also have authored any articles you are furnishing as supplemental support.
8. We note your statement here and on page 40 that you believe "the AtriCure bipolar ablation system is currently a market leader in the treatment of AF during open-heart surgical procedures." Provide supplemental independent support for this statement of leadership position. Please mark the section or sections of the supplemental materials that supports your statement.

Our Solution - Page 2
9. Please balance the discussion of your "solution" with a discussion of the principal challenges or risks facing the company, such as the fact that you have not yet received FDA approval of your product to treat the market you have targeted and the consequences of the lack of FDA approval.
10. Reconcile the disclosure in the first bullet with the disclosure on page 9, which indicates that you have not begun clinical trials to treat AF as a sole-therapy minimally invasive procedure yet.
11. We note the disclosure at the bottom of page 9, which indicates that "we may not make claims about the safety or effectiveness of the AtriCure bipolar ablation system for the ablation of cardiac tissue or the treatment of AF...." Reconcile that prohibition with the bullets under this caption.

Recent Events - Page 3
12. Here and in the Business section, under a revised heading that more accurately describes the concurrent acquisition of related party Enable Medical Corporation, please expand to discuss briefly the material terms of the acquisition agreement and the reason you are

acquiring Enable at this time. For instance, we note your disclosure
that one reason for the acquisition is to provide you with "better
control over research, development, and manufacturing activities,"
although the companies appear to be currently under common
control.
Disclose how the purchase price was determined, and quantify how
much
will be paid to affiliates of AtriCure. Briefly describe the
extent
of the affiliation between Enable and AtriCure and AtriCure`s
officers and directors. Finally, please file the agreement as an
exhibit to the registration statement.

The Offering - Page 4
13. Please revise to quantify the portion of the proceeds of the
offering to be used for each purpose indicated.
14. Please revise to indicate that Enable is a related party, and
briefly explain the basis of the affiliation between Enable and
AtriCure.
15. We note your disclosure on pages 38 and F-14 that upon
completion
of this offering, you must repay the amount you borrowed under the
terms of a credit facility that you entered into on March 8, 2005
with Lighthouse Capital Partners, and that you will additionally
pay
a fee of 15% of the aggregate amount borrowed under the credit
line.
Please revise here and on page 38 to quantify the dollar amount
outstanding under this credit facility, the dollar amount of the
15%
fee, and clarify whether you intend to use proceeds from the
offering
to pay these amounts.

Risk Factors - Page 7

Risks Relating to Our Business - Page 7
16. Many of your risk factors describe multiple risks. For
instance,
under one risk factor caption regarding the impact of failure to
comply with FDA regulations on pages 15 - 17, you discuss multiple
risks, such as risks resulting from improper product promotion,
noncompliance with ongoing QSR regulations, and the potential
negative impact of adverse event reporting. Please revise
throughout
this section to provide individual risk factor disclosure under
captions that more specifically describe each particular risk
facing
the company.
17. Under a separate risk factor caption, disclose the risks
regarding the fact that medical malpractice carriers are raising
premiums or withdrawing coverage for doctors to perform procedures
using off-label devices such as your system, as noted on page 12.

Risks Relating to the Offering - Page 22
18. Please add a risk factor discussing the risks to investors
associated with the fact that in excess of 10% of the anticipated
gross proceeds of the offering will be used to acquire the
business
of a related party.

Use of Proceeds - Page 28
19. Given the timing of the termination provision of the credit
facility with Lighthouse Capital Partners, it appears that a
portion
of the offering proceeds will be used to repay the amounts
borrowed
and the fee due at maturity. Revise to quantify these amounts and
provide the disclosures required by Instruction 4 to Item 504 of
Regulation S-K.
20. Please revise to provide the disclosure required by
Instruction 6
to Item 504 of Regulation S-K concerning the acquisition of
Enable.
Also quantify the amount of proceeds affiliates will receive as a
result of the Enable acquisition.

Capitalization - Page 29
21. Revise to remove the caption relating to cash and cash
equivalents from your presentation of capitalization.

Management`s Discussion and Analysis - Page 34

Results of Operations - Page 36
22. Please revise to quantify the increase in volume of units sold and to clarify whether price increases contributed to the increase in revenue from the prior period. Please expand to discuss and quantify each factor that contributed to the significant increase each period, including the impact from the addition of new products. Your discussion of cost of revenues should also provide quantitative details as to the increase in product shipments and clarify why the items discussed resulted in an increase to cost of revenues compared to prior year while cost of revenues as a percentage of total revenues remained the same for both years.
23. In addition, expand your discussion of expenses to discuss and quantify each significant factor that contributed to the significant variances each period.
24. Revise your discussion of research and development expense to also address the status of specific R&D projects or groups of related projects and any uncertainties associated with completing the projects. Also, revise to disclose whether historical R&D costs are indicative of future expenses.
25. We note your research and development expenses increased in 2004 as a result of the hiring of additional engineers, and that your selling, general and administrative expenses increased in 2003 due to the "rapid expansion" of your sales force. Please quantify the number of employees added and describe why additional employees were hired during each period discussed, particularly with respect to the additional salespeople considering your disclosure on page 7 that you do not believe doctors are using your system for any purpose other than the surgical treatment of atrial fibrillation, although you currently do not have the requisite FDA approval to market your product for the treatment of atrial fibrillation.

Liquidity and Capital Resources - Page 37
26. Please revise to discuss the nature of the non-cash preferred stock interest expense in your description of the differences between net loss and cash used in operations. In addition, please revise to more fully discuss your business` sources and uses of cash and capital expenditures. That analysis should focus on the drivers of your cash flows and should not be a recitation of the line items in your cash flow statement.
27. Please revise to clarify whether the $500,000 non-refundable payment to Enable in January 2005 is considered a down payment of the purchase price or paid in addition to the stated purchase price of $6.5 million ($7 million if the closing of the offering occurs after July 1, 2005).
28. Please file the credit agreement with Lighthouse Capital Partners as a material contract exhibit to the registration statement. Refer to Item 601(b)(10)(i)of Regulation S-K.
29. Please expand the discussion of critical accounting estimates to more fully describe subjective judgments and uncertainties and significant estimates associated with its application. While the notes to financial statements should present the basic accounting policies, critical accounting policy disclosure should address the nature and extent of subjective judgments and uncertainties involved in applying a principle at a given time or the variability that is

reasonably likely to result from its application over time. For example, the stock based compensation should be included as a critical accounting policy since it appears from your disclosures that there is significant judgment in your accounting for stock based compensation. Refer to FR-60 and FR 72.

Business - Page 40

30. Please expand your disclosure to discuss the development of your business as required by Item 101(a)(1) of Regulation S-K. In particular, describe the spin-off transaction in 2000 and explain the business purpose for the transaction.

31. Please provide the disclosure of the material effects of environmental regulations on your business pursuant to Item 101(c)(1)(xii) of Regulation S-K. In this regard, we note your disclosure on page 22.

32. In an appropriate location in the filing, provide more detailed information about consultants and compensation paid to them.

Clinical Trials - Page 45

33. Revise to explain what IDE approval from the FDA is, and clarify here and on page 51 whether you will need to obtain an IDE prior to each clinical trial you will conduct. If so, provide an estimate of how long the approval process could take for each IDE.

Intellectual Property - Page 55

34. Please revise to state the duration of your patents.

Manufacturing - Page 56

35. Please revise to discuss briefly the material terms of your agreement with the supplier of your ablation sensing unit, including any significant obligations or commitments of the parties, duration, termination provisions, and any intellectual property indemnification provisions. Also identify the supplier.

Management - Page 58

36. We note your disclosure on page 61 that there are existing voting agreements among the holders of your common stock, Series A preferred stock, and Series B preferred stock. Please revise to briefly discuss the terms of the agreements, and file them as exhibits to the registration statement. Refer to Item 601(b)(9) of Regulation S-K.

Principal Stockholders - Page 68

37. Please revise to identify the natural persons who have or share voting and/or investment control of the shares held by the entities identified in the table.

Certain Relationships and Related Party Transactions - Page 70

Enable - Page 72

38. Please revise to discuss in greater detail the material terms of the acquisition agreement and provide the disclosures required by Instruction 5 to Item 404(a) of Regulation S-K.

39. Please expand your disclosure to discuss the material terms of the current manufacturing and supply agreement with Enable, including any significant obligations or commitments of the parties, duration, termination provisions, and any intellectual property indemnification provisions. Please file this agreement as an exhibit to the registration statement pursuant to Item 601(b)(10)(i) of Regulation S-K.

Shares Eligible for Future Sale - Page 80
40. Please disclose the number of holders of your common stock as required by Item 201(b) of Regulation S-K.

Underwriting - Page 82
41. We note your disclosure that in connection with the offering, certain underwriters or dealers may distribute prospectuses electronically. Please describe supplementally the procedures for the electronic offer, sale and distribution of the shares and identify the underwriters who may engage in such a distribution. If you become aware of any additional members of the underwriting syndicate that may engage in electronic offers, sales or distributions after you respond to this comment, promptly supplement your response to identify those members and provide us with a description of their procedures. Also, in your discussion of the procedures, tell us how your procedures ensure that the distribution complies with Section 5 of the Securities Act. In particular:
* the communications used;
* the availability of the preliminary prospectus;
* the manner of conducting the distribution and sale, like the use of indications of interest or conditional offers; and
* the funding of an account and payment of the purchase price.
Finally, tell us whether you or the underwriters have any arrangements with a third party to host or access your preliminary prospectus on the internet. If so, identify the party and the website, describe the material terms of your agreement and provide us with a copy of any written agreement. Provide us also with copies of all information concerning your company or prospectus that has appeared on their website. Again, if you subsequently enter into any arrangements like this, promptly supplement your response.
We may have further comment.

Index to Financial Statements - Page F-1
42. Revise your filing to include Schedule II - Valuation and Qualifying Accounts for Atricure, Inc. Your independent registered public accountant should audit this schedule. Refer to Article 12 of Regulation S-X.
43. Consideration should be given to the updating requirements of Rule 3-12 of Regulation S-X.

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

Report of Independent Registered Public Accounting Firm - Page F-2
44. We note your "draft" report for the effect of a reverse stock split of your stock, which will become effective at the closing of the offering. Prior to going effective the audit report should be signed and the draft language should be removed.

Statements of Shareholders` Deficit - Page F-5
45. Please revise to disclose changes in the number of shares outstanding for each period for which changes in retained earnings are reported. It is acceptable to disclose only the changes for the most recent annual period.

Note 1. Summary of Significant Accounting Policies - Page F-7

Nature of Business
46. Provide more details of the accounting for the spin-off transaction, including the basis for recording the assets and liabilities after the spin-off and the amount of common ownership between the entities after the transaction.

Revenue Recognition
47. Tell us why shipment is the appropriate point for product sales revenue. Supplementally describe the terms and conditions of product sales in sufficient detail to support that your practice is

appropriate under SAB 104 and EITF 00-21. Please revise to address the nature and extent of any post shipment obligations, rights of return, sales incentives and customer acceptance provisions, including discussion of how these impact your revenue recognition practices. In addition, address return policies and payment terms for both end-users and distributors.

Property and Equipment

48. We see that you loan cryo-units and generators at no cost to medical providers to use your products. Tell us how you have considered whether this arrangement represents a separate unit of accounting under EITF 00-21. Tell us why a portion of revenue from the sale of the related products should not be deferred and recognized over the period the equipment is on loan. Please indicate the basis for the 3 year depreciation period. In addition, clarify whether this equipment is provided on a consignment basis, and if it subsequently sold to the customer. Details of the accounting treatment for this loaned equipment should be provided.

Note 2. Stock Option Plan - Page F-9

49. We see from page 66 that you may grant stock appreciation rights under your Equity Incentive Plan. Tell us whether you have granted any stock appreciation rights and, if so, please revise your filing to disclose how you are accounting for the rights in your audited financial statements.

50. We are deferring any evaluation of stock compensation recognized until the estimated offering price is specified, and we may have further comments in that regard when you file the amendment containing that information.

51. Please provide us with a schedule showing in chronological order, the date of grant, optionee, number of options granted, exercise price and the deemed fair value of the underlying shares of common stock for the options issued within the year preceding the contemplated IPO. Also, provide a similar schedule for issuances of common stock. Please indicate the compensation recorded for each of these issuances and reconcile to the amounts recorded in the financial statements. Tell us the objective evidence and analysis which supports your determination of the fair value at each grant and stock issuance date. Discuss the nature of any events which occurred between the dates the options were granted and the date the registration statement was filed. Relate your valuation methodology to the valuation methodology used to calculate your initial public offering price range. In addition, provide details of estimated pricing information from the underwriters and indicate whether this was considered in determining estimated fair value of the stock, options and warrants issued.

52. For options granted during the twelve months prior to the date of the most recent balance sheet, please disclose the following in the notes to your financial statements:

a. For each grant date, the number of options granted, the exercise price, the fair value of your common stock, and the intrinsic value (if any) per option.

b. Whether the valuation was contemporaneous or retrospective.

c. If the valuation specialist was a related party, please disclose that fact.

53. From your disclosure on page F-10, it appears as though your valuation was retrospective. We believe that the following disclosures would be helpful to an investor since changes in your methodologies and assumptions could have a material impact upon your financial statements. Please revise to provide the following

disclosures in MD&A:
a. The aggregate intrinsic value of all outstanding options based on
the midpoint of the estimated IPO price range.
b. Discuss the significant factors, assumptions and methodologies used in determining fair value for those options granted during the
twelve months prior to the date of the most recent balance sheet.
c. Discuss each significant factor contributing to the difference between the fair value as of the date of grant and the estimated IPO
price for options granted during the twelve months prior to the date
of the most recent balance sheet.
d. Disclose the valuation method used and the reasons why you choose
that method.
54. We see that you adjusted the fair value of your stock subsequent
to the issuance of stock options during 2004. Please update the schedule on page F-10 to show the revised fair value of options issued.

Note 3. Convertible Debt - Page F-11
55. Please revise to disclose the method used to determine the fair
value of the warrants issued with the convertible debt and the beneficial conversion feature embedded in the convertible note.
Note 4. Redeemable Preferred Stock - Page F-11
56. We note that if the Series A or B Preferred stock is converted prior to redemption, no amount is due for the 15% rate. We also note
that upon completion of the IPO, subject to certain terms, all preferred stock will convert to common stock. Revise to disclose how
you will account for the amount accrued for the 15% rate if all preferred stock is converted to common stock upon completion of the
IPO. Additionally, tell us why it is appropriate to accrue the 15%
rate as interest expense.

Note 6. Related Party - Page F-25
57. Please revise to disclose all significant transactions with related parties separately on the face of the financial statements.
Refer to SFAS 57 and Rule 4-08 (k) of Regulation S-X.

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

Note 1. Summary of Significant Accounting Policies - Page F-20

Revenue Recognition
58. Please revise to provide a more detailed analysis of your revenue
recognition policy. Disclose why shipment is the appropriate point
for product sales revenue. Specifically address the nature and extent
of any post shipment obligations, rights of return and customer acceptance provisions, including discussion of how such obligations
and provisions are considered in your practices. Regarding product
development details, disclose the significant terms of your product
development agreements and why you recognize revenue as contract costs are incurred. The accounting for these arrangements should be
clearly disclosed.

Note 2. Stock Option Plan - Page F-22
59. Revise to disclose details of how the fair values for the options
issued in fiscal 2004 were determined, including details of the specific assumptions, estimates and valuation methodologies used.
Clarify the amount of compensation recorded related to these options
and how this complies with SFAS 123.

Note 5. Related Party - Page F-25
60. Please revise to disclose all significant transactions with related parties separately on the face of the financial statements.
Refer to SFAS 57 and Rule 4-08 (k) of Regulation S-X.

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

General
61. We note the discussion on page 27 that you expect to use $6 million of the net proceeds of this offering to acquire Enable. Please reconcile this with the $6.5 to $7 million disclosed on page
F-25.
Note 2. Pro Forma Adjustments to the Unaudited Combined Balance Sheet - Page F-30
62. Tell us how you considered EITF 04-1 in considering whether there
is a preexisting relationship between AtriCure and Enable that should
be accounted for as a multiple-element transaction and measured and
accounted for in purchase accounting. We note from page 72 that you
have a master manufacturing and supply agreement with Enable.
63. Revise to provide details of the purchase price allocation that
includes the purchase price, the estimated fair value of the assets
and liabilities acquired and the allocation to identifiable intangible assets and goodwill. You should clearly identify the fair
value adjustments to net tangible assets and liabilities acquired and
indicate how you determined the value allocated to identifiable intangible assets. In addition, describe the factors that contributed to a purchase price resulting in the recognition of significant amounts of goodwill.
64. If your purchase price allocation is preliminary, please disclose
that fact and discuss why the allocation is preliminary, what events
or activities must occur for it to be final, when management expects
it to be finalized and the potential impact on the financial statements of any reallocation.

Note 3. Pro Forma Adjustments to the Unaudited Combined Statements
of Operations - Page F-31
65. Revise to clearly disclose why you are eliminating an equal amount of product sales revenue and product sales cost of revenue for
purchases between Enable and AtriCure. Clarify whether there was any
margin on these sales. In addition, indicate the nature of the $1.1
million offsetting adjustments in Notes (b) and (c) on page F-29.

Part II

Exhibits - Page II-3
66. We note your intention to file some exhibits, including your legal opinion, by amendment. Because we may have comments on these
exhibits, please file the exhibits allowing adequate time for their
review.

Exhibit 23.1 and 23.2
67. Please include an updated and signed consent from your independent auditors with any amendment filed.

* * * * *

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 supplemental 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.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed decision. Since the company and its management are in possession of all facts relating to a company`s disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, acknowledging that:

* should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;

* the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and

* the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as a confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Kristin Lochhead at (202) 942-8972 or Brian Cascio, Accounting Branch Chief, at (202) 942-1791 if you have questions regarding comments on the financial statements and related matters. Please contact Mary Beth Breslin at (202) 942-2914 or me at (202) 942-1880 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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