



DIVISION OF
CORPORATION FINANCE
Mail Stop 3030

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

August 26, 2009

Mr. Michael R. Kramer
Chief Financial Officer
ATS Medical, Inc.
3905 Annapolis Lane North, Suite 105
Minneapolis, MN 55447

Re: ATS Medical, Inc.
Form 10-K for Fiscal Year Ended December 31, 2008
Form 8-K Filed on September 14, 2007
File No. 000-18602

Dear Mr. Kramer:

We have reviewed your filings and have the following comments. Where indicated, we think you should revise your filing 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.

Form 10-K for the Year Ended December 31, 2008

Item 11. Executive Compensation, page 39
Overview of Compensation and Our Process, page 11

1. We note that the Personnel and Compensation Committee uses “comparable company compensation data” in its analysis of compensation for named executive officers. Additionally, we note from your disclosure on page 12 that base salary is determined, in part, through the use of market data. In future filings, please expand your disclosure to identify the “third party compensation database” that you discuss on the bottom of page 11 and clarify how the database is ultimately used by the Committee. Please also disclose all database components, including identifying those component companies from which your comparisons are derived.

Base Salary, page 11

2. Your disclosure indicates that individual performance is a significant factor in the determination of named executive officers’ base salary. In future filings, please provide additional disclosure and analysis as to how individual performance contributes to actual compensation for the named executive officers. For example, disclose what elements of individual performance, both quantitative and qualitative, that the Committee considered. Also disclose any specific contributions that the Committee used in its evaluation, and if applicable, how they were weighted and factored into specific compensation decisions. Refer to Item 402(b)(2)(vii) of Regulation S-K. Your revised disclosure should also address under what circumstances “merit-based salary increases based on...individual performance” are granted, as mentioned on the bottom of page 12.

Performance-Based Cash Incentive Compensation, page 13

3. Regarding your disclosure that 40% of your named executive officers’ annual cash incentive awards are based upon “individual SMART goals as determined by the Committee,” please expand your disclosure in future filings to more specifically discuss the effect of such individual goals on actual bonus compensation for each named executive officer. See Regulation S-K Item 402(b)(2)(vii).

4. We note that you have not provided a quantitative discussion of the corporate financial objectives to be achieved in order for your named executive officers to earn their “MIP” annual cash incentive awards. Please discuss the specific performance objectives established for the current year and disclose how your incentive awards are specifically structured around such performance goals. Refer to Item 402(b)(2)(v) and Instruction 2 to Item 402(b) of Regulation S-K. Please note that qualitative goals generally need to be presented to conform to the requirements of Item 402(b)(2)(v). To the extent you believe that disclosure of the information would result in competitive harm such that you may omit the information under Instruction 4 to Item 402(b) of Regulation S-K, please provide a detailed explanation supporting your conclusion. If it is appropriate to omit specific targets or performance objectives, you are required to provide appropriate disclosure pursuant to Instruction 4 to Item 402(b). Refer also to Question 118.04 of the Regulation S-K Compliance and Disclosure Interpretations available on our website at <http://www.sec.gov/divisions/corpfin/guidance/regs-kinterp.htm>. In discussing how difficult or likely it will be to achieve the target levels or other factors, you should provide as much detail as necessary without disclosing information that poses a reasonable risk of competitive harm.

Long-Term Equity Incentive Compensation, page 14

5. We note minimal discussion and analysis of how you determined specific stock option awards for each named executive officer. In future filings, we would expect to see a more focused discussion that provides substantive analysis and insight into how the Committee made actual payout determinations for the fiscal year for which compensation is being reported. Refer to paragraphs (b)(1)(iii) and (v) of Regulation S-K Item 402. If instead awards are made on a subjective basis, as your disclosure that “the Committee may establish any conditions or restrictions it deems appropriate” suggests, please say so clearly. In your response and in future filings, please also clarify the reasons for differences in the relative size of the grants among the officers.

Management's Discussion and Analysis
Critical Accounting Policies and Estimates, page 26
Note 1. Indefinite Lived Intangible Assets, page F-8

6. In the interest of providing readers with a better insight into management's judgments into accounting for goodwill, please tell us and disclose the following in future filings:
 - How you perform the two-step impairment test discussed in FASB Accounting Standards Codification 350-20-35, including the reporting unit level at which you test goodwill for impairment and your basis for that determination;
 - Each of the valuation methodologies used to value goodwill (if multiple approaches are used), including sufficient information to enable a reader to understand how each of the methods differ, the assumed benefits of a valuation prepared under each method, and why management selected these methods as being the most meaningful for the company in preparing the goodwill impairment analysis;
 - How you weight each of the methods used including the basis for that weighting (if multiple approaches are used);
 - A quantitative and qualitative description of the material assumptions used and a sensitivity analysis of those assumptions based upon reasonably likely changes;
 - If applicable, how the assumptions and methodologies used for valuing goodwill in the current year have changed since the prior year highlighting the impact of any changes.
7. Please tell us the nature of and amount of any indefinite lived-intangible assets other than goodwill. Tell us where these are included in the balance sheets and in Note 6 to the financial statements.
8. Please tell us and disclose in future filings how you assess the recoverability of other intangible assets as required by FASB Accounting Standards Codification 360-10-35. This should be separately discussed from the assessment that you perform for goodwill.

Item 13. Certain Relationships and Related Transactions..., page 40
Related Persons Transactions, page 7

9. We note your written code of conduct applies to your executive officers, including your named executive officers. However, it does not appear to cover your directors. Please tell us how you intend to satisfy in future filings your requirements under Item 404(a) of Regulation S-K. Include in your discussion what standards are to be applied pursuant to Item 404(a)(ii) of Regulation S-K.
10. We note your disclosure on page 7 of your private placement to affiliates of two of your directors, Mr. Nohra and Mr. Sutter, but it does not appear you have disclosed any current agreements with these investors. For example, please tell us why you have not discussed any registration rights agreement or agreements to appoint these individuals to the board of directors.
11. We note your disclosure on page 8 regarding your credit agreement with one of your directors, Mr. Skokos. In future filings, please clearly quantify the amounts paid to Mr. Skokos under this arrangement. For example, while you state you have no amounts currently outstanding under the credit facility, have you made any payments under the annual commitment fee requirement or any interest payments on prior advances? See Item 404(a)(4) and (5) of Regulation S-K. Also, please tell us whether you have provided the disclosure requested by Item 404(b)(2) of Regulation S-K with regards to this transaction.

Financial Statements

Note 2. Acquisitions, page F-10

12. Please tell us how the purchase price disclosed at the top of page F-11 agrees with the purchase price disclosed in the first paragraph of Note 2 on page F-10.
13. Please tell us and disclose in future filings how you determined the estimated useful lives disclosed on pages F-11 and F-13.
14. We see that a significant portion of the purchase price of the CryoCath and 3F Therapeutics acquisitions was allocated to in-process technology. Please tell us and revise future filings to disclose the state of completion at acquisition and the extent of effort necessary to complete the in-process project(s). Disclose whether the technology was brought to fruition, and if not, disclose why. Please discuss the status of efforts to complete the projects, and the impact of any delays on your expected investment return, results of operations and financial condition.

Note 5. Private Placements of Common Stock, page F-15

15. Please tell us your accounting treatment for the warrants to purchase 2.5 million shares issued to Essex Woodlands Health Ventures in fiscal 2008 and how the warrants were recorded in your financial statements.

Form 8-K Filed September 14, 2007

16. Please revise the auditors' report in Exhibit 99.1 to specifically state that the audit was conducted in accordance with "generally accepted auditing standards in the United States".

As appropriate, please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter 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.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment 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.

In connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the 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.

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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 our review of your filing or in response to our comments on your filing.

You may contact Jong Hwang at (202) 551-3327 or me at (202) 551-3676 if you have questions regarding comments on the financial statements and related matters. Please contact Celia Soehner at (202) 551-3463 or Jay Mumford, Senior Attorney, at (202) 551-3637 with any other questions.

Sincerely,

Brian Cascio
Accounting Branch Chief