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FORM DEF 14A

Definitive proxy statements

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

SCHEDULE 14A

Proxy Statement Pursuant to Section 14(a) of the Securities
Exchange Act of 1934 (Amendment No.)

Filed by the Registrant
Filed by a Party other than the Registrant

Check the appropriate box:

- Preliminary Proxy Statement
- Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))**
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Material Pursuant to §240.14a-12

ATS Medical, Inc.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement, if other than the Registrant)

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- No fee required.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

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3905 Annapolis Lane, Suite 105
Minneapolis, Minnesota 55447

Dear Fellow Shareholder:

You are cordially invited to attend the 2007 Annual Meeting of Shareholders of ATS Medical, Inc. (the "Company"), which will be held at the offices of Dorsey & Whitney LLP, Suite 1500, 50 South Sixth, Street, Minneapolis, Minnesota (on the corner of 6th Street and Nicollet Avenue in downtown Minneapolis) beginning at 4:00 p.m. on Tuesday, May 22, 2007.

This booklet contains your official notice of the 2007 Annual Meeting and a Proxy Statement that includes information about the matters to be acted upon at the meeting. Officers and directors of the Company will be on hand to review the Company's operations and to answer questions and discuss matters that may properly arise.

I sincerely hope that you will be able to attend our Annual Meeting. However, whether or not you plan to attend, please complete and return the enclosed proxy in the accompanying envelope. If you attend the meeting, you may, if you wish, withdraw any proxy previously given and vote your shares in person.

Sincerely,

A handwritten signature in black ink that reads "Michael D. Dale".

Michael D. Dale
Chairman of the Board of Directors

2007 ANNUAL MEETING OF SHAREHOLDERS



3905 Annapolis Lane, Suite 105
Minneapolis, Minnesota 55447

NOTICE OF 2007 ANNUAL MEETING OF SHAREHOLDERS

The 2007 Annual Meeting of Shareholders of ATS Medical, Inc. (the "Company") will be held on Tuesday, May 22, 2007 at 4:00 p.m. at the offices of Dorsey & Whitney LLP, Suite 1500, 50 South Sixth Street, Minneapolis, Minnesota 55402, for the following purposes:

1. To elect five members to the Board of Directors to hold office for the ensuing year and until their successors are elected and qualified;
2. To amend the 2000 Stock Incentive Plan (the "Plan") to increase the number of shares of common stock of the Company available for awards granted under the Plan by 2,000,000 shares;
3. To ratify the selection of Grant Thornton LLP as the Company's independent registered public accounting firm for the year ending December 31, 2007; and
4. To consider and act upon any other matters that may properly come before the meeting or any adjournment thereof.

Only holders of record of the common stock of the Company at the close of business on March 23, 2007 will be entitled to receive notice of and to vote at the meeting.

Whether or not you plan to attend the meeting in person, you are requested to complete and return the enclosed proxy in the accompanying envelope. If you later decide to revoke your proxy, you may do so at any time before it is exercised.

By Order of the Board of Directors,

A handwritten signature in black ink that reads "Deborah K. Chapman".

Deborah K. Chapman
Secretary

April 10, 2007

**PROXY STATEMENT
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**ATS MEDICAL, INC.
PROXY STATEMENT**

This proxy statement is furnished in connection with the solicitation of the enclosed proxy by the Board of Directors of ATS Medical, Inc. (the "Company") for use at the 2007 Annual Meeting of Shareholders to be held on Tuesday, May 22, 2007 at 4:00 p.m. at the offices of Dorsey & Whitney LLP, Suite 1500, 50 South Sixth Street, Minneapolis, Minnesota 55402, and at any adjournments thereof. On March 23, 2007, the Company had outstanding 48,957,221 shares of common stock (the "Common Stock"). Each holder of record of Common Stock as of the close of business on March 23, 2007 will be entitled to one vote on all matters being presented at the meeting for each share of Common Stock held on such date. Shareholders who sign and return a proxy may revoke it at any time before it is voted by giving written notice to the Secretary of the Company. This proxy statement and the enclosed proxy card are being mailed to shareholders commencing on or about April 2, 2007.

Expenses in connection with this solicitation of proxies will be paid by the Company. Proxies are being solicited primarily by mail, but, in addition, officers and employees of the Company, who will receive no extra compensation for their services, may solicit proxies by telephone or personal calls. The Company also will request that brokers or other nominees who hold shares of Common Stock in their names for the benefit of others forward proxy materials to, and obtain voting instructions from, the beneficial owners of such stock at the Company's expense.

Proxies that are completed, signed and returned to the Company prior to the Annual Meeting will be voted as specified. If no direction is given, the proxy will be voted for the election of the nominees for director named in this proxy statement and for the management proposals discussed herein and in accordance with the judgment of the persons named in the proxy as to any other matters that properly come before the meeting. If a shareholder abstains from voting as to any matter (or indicates a "withhold vote for" as to directors), then the shares held by such shareholder shall be deemed present at the Annual Meeting for purposes of determining a quorum and for purposes of calculating the vote with respect to such matter, but shall not be deemed to have been voted in favor of such matter. If a broker returns a "non-vote" proxy, indicating a lack of authority to vote on such matter, then the shares covered by such non-vote shall be deemed present at the Annual Meeting for purposes of determining a quorum but shall not be deemed to be represented at the Annual Meeting for purposes of calculating the vote with respect to such matters.

PROPOSAL 1 – ELECTION OF DIRECTORS

Five directors have been nominated for election to the Company's Board of Directors at the 2007 Annual Meeting of Shareholders to hold office for a term of one year and until their successors are duly elected and qualified (except in the case of earlier death, resignation or removal). The accompanying proxy is intended to be voted for the election of nominees for director named below, unless authority to vote for one or more nominees is withheld as specified on the proxy card. Cumulative voting is not permitted. In accordance with a recent change in Minnesota law, the nominees for election as directors at the Annual Meeting will be elected by a plurality of the votes cast at the meeting. This means that since shareholders will be electing five directors, the five nominees receiving the highest number of votes will be elected. Votes withheld from one or more director nominees will have no effect on the election of any director from whom votes are withheld. In the event that any nominee becomes unable or unwilling to serve as a director for any reason, the persons named in the enclosed proxy will vote for a substitute nominee in accordance with their best judgment. The Board of Directors has no reason to believe that any nominee will be unable or unwilling to serve as a director if elected.

The Board of Directors recommends a vote "FOR" the election of the five nominated directors. In accordance with Minnesota law, the five nominees receiving the highest number of votes will be elected. Proxies will be voted in favor of the election of the five nominees unless otherwise specified.

Each nominee has furnished to the Company the following information with respect to his principal occupations or employment during the last five years and his directorships at other companies subject to the reporting requirements of the Securities Exchange Act of 1934 or the Investment Company Act of 1940.

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Michael D. Dale, 47, has been Chief Executive Officer and President of ATS Medical since October 2002, and Chairman of the board of directors since May 2004. From 2000 to 2002, Mr. Dale was Vice President of Worldwide Sales and Marketing at Endocardial Solutions, Inc. a company that develops, markets and distributes an advanced cardiac mapping system. Mr. Dale joined Endocardial Solutions in December 1998 as Vice President of Worldwide Sales. From 1996 to 1998, Mr. Dale was Vice President of Global Sales for Cyberonics, Inc., a medical device company, and additionally was managing director of Cyberonics Europe S.A. From 1988 to 1996, Mr. Dale served in several capacities at St. Jude Medical, most recently as the Business Unit Director for St. Jude Medical Europe. Mr. Dale is on the board of directors of Enpath Medical, Inc., a medical products company that designs, develops, manufactures and markets percutaneous delivery solutions.

Robert E. Munzenrider, 62, is a retired financial and operating executive. From 2000 to 2002, Mr. Munzenrider was President of Harmon AutoGlass, a subsidiary of Apogee Enterprises, Inc. In 1999, he served as Vice President and Chief Financial Officer of the Glass Services Segment of Apogee Enterprises. He also served as Executive Vice President and Chief Financial Officer of Eliance Corp., an e-commerce service provider, during part of 1999. From 1997 to 1998, Mr. Munzenrider served as Vice President and Chief Financial Officer of St. Jude Medical, Inc. From 1983 to 1997, he served as Vice President and Chief Financial Officer of three subsidiaries of Viad Corp. and predecessor companies, including Travelers Express Company, Inc., Restaura, Inc. and Bell Atlantic Systems Leasing, Int. (previously Greyhound Computer Corporation). Mr. Munzenrider is a Certified Public Accountant. Mr. Munzenrider also serves as a director on the board of Viad Corp., and is a Trustee Emeritus on the University of Montana Foundation. Mr. Munzenrider was elected as a director of ATS Medical in June 2003.

Eric W. Sivertson, 56, has served as the President and Chief Executive Officer of Dymedix Corporation, a company developing and marketing technology to help advance the science of sleep medicine, since June 2005. Prior to Dymedix, Mr. Sivertson was a partner in the Minneapolis office of DHR International Executive Search, which focuses on the medical device, diagnostic and healthcare supply industries, from 2003 to 2005. From 2002 to 2003, Mr. Sivertson was a partner at TMP/Highland Partners, an executive search firm. From 1999 to 2003, Mr. Sivertson served as President and Chief Executive Officer of netRegulus, Inc., a web-based regulatory and clinical information technology company. From 1997 to 1999, Mr. Sivertson served as President and Chief Executive Officer of Biocompatible Cardiovascular, Ltd. Preceding this, Mr. Sivertson served as Division President of International, Cardiovascular and Cardiac Rhythm Management for St. Jude Medical, a medical device manufacturer and marketer, from 1985 to 1996. Mr. Sivertson started his career at American Hospital Supply Corporation and held various sales and marketing positions from 1976 to 1985, including Vice President of Marketing for the Convertors Division. Mr. Sivertson was elected as a director of ATS Medical in January 2003. Mr. Sivertson also serves on the board of directors of Dymedix Corporation and ExitCare LLC.

Theodore C. Skokos, 59, is a retired attorney, having practiced law from 1973 through 1994. Since his retirement, he has been involved in various business enterprises, including founding and serving as an officer of three entities involved in the cellular telephone business. Additionally, from 1999 to 2001, he served as chairman and president of The Flight Department, Inc., a privately held aircraft management and air charter company, located in Aspen, Colorado. Mr. Skokos was appointed as a director of ATS Medical in September 2006.

Mr. Skokos was a founder and former Chairman of the Board of 3F Therapeutics, Inc. (3F), which was acquired by the Company in 2006. Under the merger agreement between 3F and the Company, the representative of the former stockholders of 3F was entitled to designate a person to serve as a member of the Company's Board of Directors until the Company's next annual meeting of shareholders. Mr. Skokos was selected by the 3F stockholder representative as its designee to the Company's Board of Directors. Under the merger agreement, the Company is obligated to continue to nominate Mr. Skokos, or his successor, for election to the Board of Directors through 2013, unless he fails to be so elected or is removed from the Board of Directors. Other than in connection with the merger agreement described above, there are no arrangements or understandings between Mr. Skokos and any other persons pursuant to which Mr. Skokos was selected as a director. Mr. Skokos has not been appointed to serve on any of the Company's Board committees.

Steven M. Anderson, 44, has been Vice-President of Clinical, Regulatory, Reimbursement and Quality for Acorn Cardiovascular, Inc., a company developing implantable therapies for the treatment of heart failure, since 2000. From 1998 to 2000, Mr. Anderson served as Vice President of Regulatory, Clinical, Quality and Reimbursement at St. Croix Medical, Inc., a medical device company. From 1996 to 1998, Mr. Anderson served as

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Director of the Medical Division for TUV Product Service, a European notified body for the Medical Device Directive. Between 1987 and 1996, Mr. Anderson served in several capacities at St. Jude Medical, Inc., most recently as Senior Manager of Worldwide Regulatory Affairs. From 1982 to 1986 he served in a development engineering position at Medtronic, Inc. Mr. Anderson is currently an Adjunct Professor at the University of St. Thomas Graduate School. Mr. Anderson was elected as a director of ATS Medical in May 2006.

DIRECTOR INDEPENDENCE

The Board of Directors has determined that a majority of the members of the Board continuing in office after this annual meeting, including all of the members of its three standing committees, namely Messrs. Anderson, Munzenrider and Sivertson, are “independent” directors under the applicable listing standards of the NASDAQ Stock Market. In addition, the Board of Directors had previously determined that two additional persons who served as directors of the Company in 2006, Mr. John D. Buck and Mr. David D. Koentopf, were independent directors as well during their respective periods of service on the Board. In assessing the independence of the directors, the Board considers any transactions, relationships and arrangements between the Company and its independent directors or their affiliated companies. This review is based primarily on responses of the directors to questions in a directors’ and officers’ questionnaire regarding employment, business, familial, compensation and other relationships with the Company or its management. There were no transactions, relationships or arrangements between the Company and any of the independent directors or the independent directors’ affiliated companies which came to the attention of the Board during this process for additional review.

COMMITTEES OF THE BOARD OF DIRECTORS AND ATTENDANCE

The Board of Directors held nine meetings during 2006. Each Director attended at least 80% of the meetings of the Board and the committees of which he was a member. All Directors, if previously elected, were in attendance at the 2006 Annual Meeting of Shareholders. Board members are encouraged to attend the Annual Meetings of Shareholders.

The Board of Directors has three standing committees: (1) an Audit, Finance and Investment Committee, (2) a Personnel and Compensation Committee and (3) a Nominating, Corporate Governance and Regulatory Compliance Committee. The charter for each of these committees is available for review on our website at www.atsmedical.com. The functions of the Audit, Finance and Investment Committee are to review and monitor accounting policies and control procedures of the Company, including recommending the engagement of the independent registered public accounting firm and reviewing the scope of the audit. The Audit, Finance and Investment Committee, on which Messrs. Sivertson, Anderson and Munzenrider serve, held thirteen meetings during 2006. All of the members of the Audit, Finance and Investment Committee are independent for purposes of the Nasdaq listing requirements. Mr. Munzenrider qualifies as an “audit committee financial expert” under the rules of the Securities and Exchange Commission.

The Personnel and Compensation Committee reviews and establishes compensation levels for each of the Company’s officers, as well as jointly administers the Company’s stock plans with the Board of Directors. The Personnel and Compensation Committee, on which Messrs. Sivertson, Anderson and Munzenrider serve, held seven meetings during 2006. All of the members of the Personnel and Compensation Committee are independent for purposes of the Nasdaq listing requirements.

The Company also has a Nominating, Corporate Governance and Regulatory Compliance Committee, which is responsible for determining the slate of director nominees for election by shareholders, which the committee recommends for consideration by the Board of Directors. Messrs. Sivertson, Anderson and Munzenrider currently serve on the Nominating, Corporate Governance and Regulatory Compliance Committee and are independent for purposes of the Nasdaq listing requirements. During 2006, the Nominating, Corporate Governance and Regulatory Compliance Committee held one formal meeting and several discussions during Board meetings regarding board positions and conducted interviews of potential director candidates.

SHAREHOLDER COMMUNICATIONS WITH THE BOARD OF DIRECTORS

Shareholders may send written communications to the attention of the Board of Directors. Any shareholder desiring to communicate with our Board of Directors, or one or more of our directors, may send a letter addressed to the Board of Directors c/o Corporate Secretary at 3905 Annapolis Lane, Suite 105, Minneapolis, Minnesota 55447. The Corporate Secretary has been instructed by the Board of Directors to promptly forward all communications so received to the full Board of Directors or the individual members of the Board of Directors specifically addressed in the communication.

NOMINATIONS

All director nominees approved by the Board of Directors and all individuals appointed to fill vacancies created between our annual meetings of shareholders are required to stand for election by shareholders at the next annual meeting.

The Nominating, Corporate Governance and Regulatory Compliance Committee determines the required selection criteria and qualifications of the director nominees based upon the needs of the Company at the time nominees are considered. A candidate must possess the ability to apply good business judgment and must be in a position to properly exercise his or her duties of loyalty and care. Candidates should also exhibit proven leadership capabilities, high integrity and experience with a high level of responsibilities within their chosen fields, and have the ability to quickly grasp complex principles of business and finance. In general, candidates will be preferred who hold or have held an established executive level position in business, finance, law, education, research or government. The Nominating, Corporate Governance and Regulatory Compliance Committee will consider these criteria for nominees identified by the Committee, by shareholders, or through some other source. During 2006, the Nominating, Corporate Governance and Regulatory Compliance Committee used the services of a third party search firm to assist in the identification and evaluation of director candidates.

The Nominating, Corporate Governance and Regulatory Compliance Committee will consider qualified candidates for possible nomination that are submitted by our shareholders. Shareholders wishing to make such a submission may do so by sending the following information to the Nominating, Corporate Governance and Regulatory Compliance Committee c/o Corporate Secretary at 3905 Annapolis Lane, Suite 105, Minneapolis, Minnesota 55447: (1) name of the candidate and a brief biographical sketch and resume; (2) contact information for the candidate and a document evidencing the candidate's willingness to serve as a director if elected; and (3) a signed statement as to the submitting shareholder's current status as a shareholder and the number of shares currently held. No candidates for director nominations were submitted to the Nominating, Corporate Governance and Regulatory Compliance Committee by any shareholder in connection with the 2006 Annual Meeting.

The Nominating, Corporate Governance and Regulatory Compliance Committee conducts a process of making preliminary assessments of each proposed nominee based upon the resume and biographical information, an indication of the individual's willingness to serve and other background information. This information is evaluated against the criteria set forth above and the specific needs of the Company at that time. Based upon a preliminary assessment of the candidate(s), those who appear to be best suited to meet the needs of the Company may be invited to participate in a series of interviews, which are used as a further means of evaluating potential candidates. On the basis of information learned during this process, the Nominating, Corporate Governance and Regulatory Compliance Committee determines which nominee(s) to recommend to the Board of Directors to submit for election at the next annual meeting of shareholders. The Nominating, Corporate Governance and Regulatory Compliance Committee uses the same process for evaluating all nominees, regardless of the original source of nomination.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires our directors and executive officers and all persons who beneficially own more than 10% of our outstanding shares of common stock to file with the SEC initial reports of ownership and reports of changes in ownership of such common stock. Directors, executive officers and 10% or more beneficial owners are also required to furnish us with copies of all Section 16(a) reports they file. Based solely on a review of the copies of such forms furnished to us, we believe that our executive officers, directors and 10% shareholders complied with all Section 16(a) filing requirements applicable to them during 2006.

CODE OF CONDUCT

In 2004, we adopted a Code of Conduct for our employees, including our principal executive officer, principal financial officer and principal accounting officer, which is posted on our website (www.atomedical.com). We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding an amendment to, or waiver from a provision of the Code of Conduct by posting such information on our website at the address specified above.

RELATED PERSON TRANSACTION POLICY

Under its charter, our Audit, Finance and Investment Committee is responsible for reviewing and approving all related party transactions. We annually require each of our directors and executive officers to complete a director and officer questionnaire that elicits information about related person transactions, including any such transactions which are required to be disclosed under the rules of the Securities and Exchange Commission. In addition, under our Code of Conduct our directors, officers and employees are expected to avoid conflicts of interest with the Company and are required to report any such conflicts of interest to our CEO or CFO, or to the Chair of our Audit, Finance and Investment Committee. Our Audit, Finance and Investment Committee reviews all such transactions and relationships which come to its attention either through the director and officer questionnaires or otherwise, and considers whether to approve or take other appropriate action with respect to such transactions or relationships.

During fiscal 2006, our only related person transaction required to be disclosed under the rules of the Securities and Exchange Commission was the acquisition of 3F Therapeutics. The 3F acquisition is required to be disclosed because Mr. Skokos, who became one of our Directors after and as a result of the closing of the acquisition, was a founder and former Chairman of 3F Therapeutics. In addition, Mr. Skokos beneficially owned a significant equity interest in 3F with the result that he now beneficially owns 3,141,946 shares of our Common Stock and has a significant interest in the contingent consideration which may eventually be paid to the former shareholders of 3F. The Audit, Finance and Investment Committee was aware of Mr. Skokos involvement in the 3F transaction when he joined the Board of Directors. The Audit, Finance and Investment Committee has not determined that Mr. Skokos is an independent director within the meaning of the applicable NASDAQ and Securities and Exchange Commission rules.

REPORT OF THE AUDIT, FINANCE AND INVESTMENT COMMITTEE OF THE BOARD OF DIRECTORS

The Audit, Finance and Investment Committee of our Board of Directors is composed of the following non-employee directors: Messrs. Sivertson, Anderson and Munzenrider. Mr. Munzenrider currently serves as the Chairman of the Audit, Finance and Investment Committee. All of the members of the Audit, Finance and Investment Committee are independent for purposes of the Nasdaq listing requirements. Mr. Munzenrider qualifies as an “audit committee financial expert” under the rules of the Securities and Exchange Commission. The Audit, Finance and Investment Committee operates under a written charter adopted by the Board of Directors, which is available for review on the Company’s website at www.atsmedical.com. The Audit, Finance and Investment Committee recommends to the Board of Directors, and submits for shareholder ratification, the appointment of the Company’s independent registered public accounting firm.

Management is responsible for the Company’s internal controls and the financial reporting process. Our independent registered public accounting firm is responsible for performing an independent audit of our consolidated financial statements in accordance with generally accepted auditing standards and for issuing a report on our financial statements. The Audit, Finance and Investment Committee’s responsibility is to monitor and oversee these processes.

In this context, the Audit, Finance and Investment Committee has met and held discussions with management and the independent registered public accounting firm. Management represented to the Audit, Finance and Investment Committee that the Company’s consolidated financial statements were prepared in accordance with

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generally accepted accounting principles, and the Audit, Finance and Investment Committee has reviewed and discussed the consolidated financial statements with management and the independent registered public accounting firm. The Audit, Finance and Investment Committee discussed with the independent registered public accounting firm matters required to be discussed by Statement on Auditing Standards No. 61 (*Communications with Audit Committees*).

The Company's independent registered public accounting firm also provided to the Audit, Finance and Investment Committee the written disclosure required by Independence Standards Board Standard No. 1 (*Independence Discussions with Audit Committees*), and the Audit, Finance and Investment Committee discussed with the independent registered public accounting firm the auditing firm's independence. The Committee also considered whether non-audit services provided by the independent registered public accounting firm during the last fiscal year were compatible with maintaining the independent registered public accounting firm's independence.

Based upon the Audit, Finance and Investment Committee's discussion with management and the independent registered public accounting firm and the Audit, Finance and Investment Committee's review of the representation of management and the report of the independent registered public accounting firm to the Audit, Finance and Investment Committee, the Audit, Finance and Investment Committee recommended to the Board of Directors that the audited consolidated financial statements be included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2006 filed with the Securities and Exchange Commission.

Members of the Audit, Finance and Investment
Committee of the Board of Directors:

Robert E. Munzenrider, Chairman
Eric W. Sivertson
Steven M. Anderson

COMPENSATION OF DIRECTORS

We pay each of our directors \$20,000 as an annual retainer (increased from \$15,000 in July 2006), payable quarterly, for service on our Board of Directors. An additional \$5,000 annual retainer is paid quarterly to the chair of the Audit, Finance and Investment Committee and a \$3,500 annual retainer (decreased from \$5,000 in July 2006) is paid quarterly to the Chair of the Personnel and Compensation Committee. In addition, directors are paid \$1,000 for each board meeting attended in person and \$500 for each board meeting attended telephonically. Audit, Finance and Investment Committee and Personnel and Compensation Committee members, excluding the chairs effective July 2006, are paid an additional \$750 for each meeting of the Audit, Finance and Investment Committee and Personnel and Compensation Committee attended. We also reimburse our directors for travel-related expenses.

In July 2006, the Board of Directors approved changes to the equity-based compensation program for Board members. Prior to these changes each non-employee director received an option to purchase 5,000 shares of the Company's common stock upon his or her initial election to the Board with an exercise price equal to the fair market value of the stock on the date of election. Upon re-election, each non-employee director received an option to purchase 2,500 shares of Company common stock with an exercise price equal to the fair market value of the stock on the date of re-election. After these changes, upon initial election to the Board of Directors, each outside director is granted a restricted stock unit award ("RSU") of 3,000 shares that vests on the second anniversary of the date of award. In addition, upon each reelection to the Board of Directors, each outside director receives a yearly equity retainer of RSUs equal to \$45,000, based on the closing price of our stock on the date of the award. Such RSUs vest on the earlier of the date of the second annual meeting following the date of award or June 30 of the second year following the date of award. Consistent with the foregoing, Messrs. Sivertson, Anderson and Munzenrider each received RSU awards equal to \$45,000 in 2006 and Mr. Skokos received an RSU award of 3,000 shares in 2006.

Director Compensation Table

The following table shows the compensation of the members of our Board of Directors during fiscal year 2006.

Name (1)	Fees Earned or Paid in Cash (\$)	Stock Awards (\$) (2)	Option Grants (\$) (3)	Total (\$)
Eric W. Sivertson	\$ 37,875	\$ 6,326	\$ 4,304	\$ 48,505
Robert E. Munzenrider	42,000	6,326	4,304	52,630
Steven M. Anderson	19,500	6,326	10,172	35,998
Theodore C. Skokos	7,000	731	–	7,731
John D. Buck (4)	37,062	1,206	–	38,268
David D. Koentopf (5)	13,133	1,292	–	14,425

- (1) Mr. Dale, our Chief Executive Officer and President is not included in this table because he was an employee of the Company during 2006 and thus received no compensation for his service as a director. The compensation he received as an employee of the Company is shown in the Summary Compensation Table.

- (2) The amounts in this column are calculated based on FAS 123R and equal the financial statement compensation expense as reported in our 2006 consolidated statement of income for the fiscal year. See Note 9 of the consolidated financial statements in the Company's Annual Report on Form 10-K for the year ended December 31, 2006 regarding assumptions underlying the valuation of equity awards. The aggregate number of RSU award shares outstanding at December 31, 2006 was 18,750 shares for Messrs. Sivertson, Munzenrider and Anderson, and 3,000 shares for Mr. Skokos, all of which were awarded during 2006. The award date fair value of these 2006 awards was \$45,000 for Messrs. Sivertson, Munzenrider and Anderson, and \$7,080 for Mr. Skokos.
- (3) The amounts in this column are calculated based on FAS 123R and equal the financial statement compensation expense as reported in our 2006 consolidated statement of income for the fiscal year. See Note 9 of the consolidated

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financial statements in the Company's Annual Report on Form 10-K for the year ended December 31, 2006 regarding assumptions underlying the valuation of equity awards. The aggregate number of stock option grant shares outstanding at December 31, 2006, was 16,250 shares for Mr. Sivertson, 13,750 shares for Mr. Munzenrider, 5,000 shares for Mr. Anderson, and no shares for Mr. Skokos. Mr. Anderson's outstanding stock options were granted in 2006 and had a grant date fair value of \$10,172.

- (4) Mr. Buck did not stand for re-election at the 2006 annual meeting of shareholders.
- (5) Mr. Koentopf resigned as a director of the Company on May 4, 2006.

EXECUTIVE COMPENSATION

Compensation Discussion and Analysis

Philosophy. Our compensation programs are designed to attract and retain key employees, motivating them for superior performance. The compensation programs are designed to encourage both short and longer-term performance and to emphasize increasing our shareholder value over the long term. Our executive compensation programs impact all of our employees by establishing general levels of compensation, and creating an environment of goals, rewards and expectations. Because we believe the performance of every employee is important to our success, we are mindful of the impact of executive compensation and incentive programs on all of our employees.

We also believe that the compensation of our executives should reflect their success relative to their individual development goals, as well as their collective success as a management team. Collective goals of management include growth in sales and operating income metrics, which we believe will ultimately result in an increase in the value of our stock price. We believe that the performance of our executives in managing the company should be the basis for determining their overall compensation. We also believe that their compensation should not be based on the short-term performance of our stock, whether favorable or unfavorable, but rather that the price of our stock will, in the long term, reflect our operating performance, and ultimately, the management of the company by our executives. Consequently, we seek to have the long-term performance of our stock reflected in executive compensation through our equity incentive plans.

Overview of Compensation and our Process. The Personnel and Compensation Committee of our Board of Directors (the "Committee") is composed entirely of independent outside directors and is responsible for setting our compensation policy and approving each component of compensation for the executive officers named in the Summary Compensation Table below (our "named executive officers"). Our Chief Executive Officer develops initial recommendations for all components of compensation for our named executive officers and presents the recommendations to the Committee for review and approval. In 2006, both the Committee and the Company retained independent compensation consultants to advise them in fulfilling their responsibilities in this process.

Components of Our Compensation Program. For the fiscal year ended December 31, 2006, the principal components of compensation for our named executive officers were:

- base salary;
- performance-based cash incentive compensation; and
- long-term equity incentive compensation.

We do not have a pre-established formula or target for the allocation between either cash and non-cash or short-term and long-term incentive compensation. Rather, in general, our policy for allocating between long-term and currently-paid compensation is to ensure adequate base compensation to attract and retain executive officers, while providing incentives to maximize long-term value for the Company and our shareholders.

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Base Salary

We provide our named executive officers and other employees with base salary to compensate them for services rendered during the fiscal year. Base salary ranges are established for each of our executives based on his or her position and responsibility, and by using market data. Base salary ranges are designed so that salary opportunities for a given position will be between 80% and 120% of the midpoint of the base salary established for each range.

During its annual review of the base salaries for our executives, the Committee primarily considers:

- market data provided by our outside consultants;
- an initial review of the executive' s compensation, both individually and relative to other executive officers; and
- the individual performance of the executive.

The Committee reviews the base salary of an executive annually and also when he or she is promoted or when his or her job responsibilities are otherwise changed. Our executives are also eligible for merit based salary increases based on the Committee' s assessment of individual performance.

Performance-Based Cash Incentive Compensation

The 2006 Management Incentive Plan ("MIP") is an annual cash incentive program based on a combination of corporate financial and individual objectives. The MIP was approved by the Committee at the beginning of 2006 and was designed to align our incentive compensation to our 2006 operating objectives. Each named executive officer was eligible for a target MIP bonus ranging from 35% to 50% of their base salary.

For 2006, 80% of a named executive officer' s MIP award was based on the achievement of corporate financial objectives relating to revenue and operating loss levels with each component accounting for 40% of the overall target bonus. The remaining 20% of each executives target MIP bonus was based on individual SMART goals as determined by the Committee. The term SMART relates to a specific compensation philosophy that incentive goals should be **S**pecific, **M**easurable, **A**ttainable, **R**elated to the mission and **T**ime bound. Performance in relation to each executive' s SMART goals is measured on a quarterly basis.

Each year the Committee sets minimum, target and maximum levels for each component of the corporate financial objective of the MIP. Payment awards under the MIP are based on the attainment of the objective for the current year. As necessary, the Committee in its discretion may modify or re-weight the corporate objectives and/or individual objectives during the course of the year to reflect changes in the Company' s business plan, the general business environment and other factors. Executive officers participating in the MIP receive:

- no payment for the corporate financial objective portion of the MIP award unless we achieve the minimum performance level (90% of the target)
- a payment of at least 9% but less than 100% of the target award opportunity for the corporate financial objective portion of the MIP award if we exceed or achieve the minimum performance level but do not achieve the target performance level
- a payment of at least 100% but less than 182% of the target award opportunity for the corporate financial objective portion of the MIP award if we exceed or achieve the target performance level

Long-term Equity Incentive Compensation

Our stock-based equity incentive awards are made pursuant to our 2000 Stock Incentive Plan. The Committee may award participants restricted stock units or grant them stock options. In making awards of restricted stock units or grants of stock options, the Committee may establish any conditions or restrictions it deems appropriate. Typically, the Committee awards restricted stock units, which vests in annual installments over a term of either four or five years with the first vesting occurring on the one year anniversary of the grant date.

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All grants of stock options are made at the market price at the time of the grant. Annual awards of restricted stock units to executives are made at the Committee's regularly scheduled May meeting. Grants of stock options or awards of restricted stock to newly hired executive officers who are eligible to receive them are made at the next regularly scheduled Committee meeting on or following their hire date.

Our long-term equity incentive compensation is designed to align the interest of each executive officer with those of our shareholders and provide each executive officer with an incentive to manage our business from the perspective of an owner with an equity stake in the business. In general, we view long-term equity incentive compensation as incentive for future performance and not as compensation for past accomplishments. Although we do not use a set formula to award long-term equity incentive compensation to our executive officers, the Committee takes into consideration the job responsibilities, experience, and contributions of the individual, as well as the recommendations of our Chief Executive Officer, in determining the amount (if any) of long-term equity incentive compensation to award to executive officers.

Section 162(m) of the Internal Revenue Code. Section 162(m) of the Code generally limits the corporate deduction for compensation paid to executive officers to \$1.0 million, unless the compensation qualifies as a "performance-based compensation" under the Code. Compensation resulting from restricted stock unit awards and stock option grants under the Plan or the Stock Purchase Plan will not be counted toward the \$1.0 million of deductible compensation under Section 162(m). The Committee does not believe that the annual compensation for Section 162(m) purposes of any of the Company's executive officers will exceed \$1.0 million in fiscal 2007.

Compensation Committee Report

The Personnel and Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis with management. Based upon this review and discussion, the Personnel and Compensation Committee recommended to the Board of Directors that the Compensation Discussion and Analysis be included in this proxy statement.

Members of the Personnel and Compensation
Committee of the Board of Directors:

Eric W. Sivertson, Chairman
Steven M. Anderson
Robert E. Munzenrider

Summary Compensation Table

The following table sets forth the cash and non-cash compensation awarded to or earned by our Principal Executive Officer, Principal Financial Officer(s) and the three other most highly compensated executive officers during 2006:

Name and Principal Position	Year	Salary	Bonus (1)	Stock Awards (2)	Option Awards (2)	Non-Equity Incentive Plan Compensation (3)	All Other Compensation	Total
Michael D. Dale Chief Executive Officer	2006	\$ 350,000	\$ 100,000	\$ 171,104	\$ 21,552	\$ 78,400	\$ 1,000	\$ 722,056
Michael R. Kramer Acting Chief Financial Officer	2006	27,459	–	2,123	–	5,586	67,424(4)	\$ 102,592
Deborah K. Chapman (5) Controller	2006	105,000	–	4,423	12,979	8,694	4,738	\$ 135,834
John R. Judd (6) Former Chief Financial Officer	2006	101,108	–	38,848	–	–	8,838	\$ 148,794
Richard A. Curtis V.P. of Corporate Development	2006	203,958	–	40,468	12,754	46,502	4,350	\$ 308,032
Marc R. Sportsman (7) Former V.P. of Sales	2006	248,062	–	30,859	47,137	53,058	17,074(8)	\$ 396,190
Terrie Ajamil V.P. of International Markets	2006	215,000	–	33,021	–	45,795	13,126(8)	\$ 306,942

(1) Bonuses for prior years were previously reported in this column. Under current reporting rules, however, only purely discretionary or guaranteed bonuses are disclosed in this column. Except for the bonuses shown in this column, all of our bonuses for 2006 were awarded based upon the achievement of certain performance targets. Accordingly, most of our bonus amounts are reported in the Non-Equity Incentive Plan Compensation column.

(2) Amounts calculated utilizing the provisions of Statement of Financial Accounting Standards (“SFAS”) No. 123R, “Share-based Payments.” See Note 9 of the consolidated financial statements in the Company’s Annual Report on Form 10-K for the year ended December 31, 2006 regarding assumptions underlying the valuation of equity awards.

(3) The amounts in this column relate to awards granted under our 2006 Management Incentive Plan. That plan and these awards are discussed in the Compensation Discussion and Analysis section of this proxy statement.

(4) Consists of consulting fees paid to Mr. Kramer prior to his employment with the Company.

(5) Ms. Chapman is included in the table because she served as our principal financial officer for a portion of 2006.

(6) Mr. Judd terminated his employment with the Company effective July 21, 2006.

(7) Mr. Sportsman terminated his employment with the Company effective February 2, 2007.

(8) Includes health club reimbursements, automobile allowance, value of sales award trips and 401(k) employer match, no individual item of which was greater than \$10,000.

Grants of Plan-Based Awards

The following table summarizes the 2006 grant of equity and non-equity plan-based awards to the executive officers named in the Summary Compensation Table. All of the non-equity incentive plan based awards were made under the Company's 2006 Management Incentive Plan. All of the equity incentive plan based awards were made under the Company's 2000 Stock Incentive Plan.

Name	Grant Date	Estimated Future Payouts Under Non-Equity Incentive Plan Awards (1)			All Other Stock Awards: Number of Shares of Stock or Units (2) (#)	Grant Date Fair Value of Stock and Option Awards (3)
		Threshold \$	Target \$	Maximum \$		
Michael D. Dale	5/12/06	\$ 12,727	\$ 175,000	\$ 269,545	40,000	\$ 118,000
John R. Judd	–	3,700	50,880	84,183	–	–
Michael R. Kramer	10/2/06	891	12,250	20,268	20,000	47,800
Deborah K. Chapman	5/1/06	1,513	20,800	34,415	4,500	13,365
Richard A. Curtis	5/1/06	7,417	101,979	168,729	39,000	115,830
	12/7/06	–	–	–	50,000	111,000
	12/21/06	–	–	–	50,000	105,000
Marc R. Sportsman	5/1/06	9,020	124,031	205,215	39,000	115,830
Terrie Ajamil	5/1/06	7,818	107,500	177,864	39,000	115,830

- (1) The material terms of the Management Incentive Plan are described at page 9 of this proxy statement.
- (2) There were no stock option grants to named executive officers during 2006. All awards were RSU awards.
- (3) All 2006 awards were restricted stock units (RSU). The grant date fair value of RSUs awarded is based on the closing market price of the Company's common stock on the date of the award.

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Outstanding Equity Awards at Fiscal Year-End

The following table summarizes the total outstanding equity awards held at the end of the 2006 fiscal year by the executive officers named in the Summary Compensation Table:

Name	Option Awards				Stock Awards	
	Number of Securities Underlying Unexercised Options		Option Exercise Price (\$)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested (\$)(2)
	(1) Exercisable	Unexercisable				
Michael D. Dale	225,000	–	\$ 0.37	9/18/2012	150,000(5)	\$ 310,500
	75,000	–	0.37	9/18/2012	40,000 (6)	82,800
	50,000	–	3.80	12/19/2013	–	–
John R. Judd	–	–	–	–	–	–
Michael R. Kramer	–	–	–	–	20,000 (7)	41,400
Deborah K. Chapman	3,500	–	5.06	12/15/2007	2,250 (8)	4,658
	3,000	–	6.38	4/13/2009	4,500 (6)	9,315
	5,000	–	8.50	2/22/2010	–	–
	10,000	–	9.88	5/4/2010	–	–
	5,625	–	8.19	5/2/2011	–	–
	15,000	–	0.51	11/6/2012	–	–
	18,750	6,250 (3)	2.51	4/30/2013	–	–
	20,000	–	3.80	12/19/2013	–	–
Richard A. Curtis	125,000	–	0.52	12/17/2012	22,500 (8)	46,575
	20,000	–	3.80	12/19/2013	39,000 (6)	80,730
					50,000 (9) 50,000 (10)	103,500 103,500
Marc R. Sportsman	187,500	62,500(4)	1.02	3/24/2013	15,000 (11)	31,050
	20,000	–	3.80	12/19/2013	39,000 (11)	80,730
Terrie Ajamil	100,000	–	4.20	1/5/2014	15,000 (8)	31,050
					39,000 (6)	80,730

(1) All exercisable option awards were fully vested at December 31, 2006.

- (2) Market value of restricted stock unit awards outstanding at year-end is based on the closing market price of the Company' s common stock at December 31, 2006 of \$2.07 per share.
- (3) Unexercisable stock options will vest on April 30, 2007.
- (4) Unexercisable stock options vested on February 1, 2007 under a separation agreement between the Company and Mr. Sportsman.
- (5) 33 1/3% of remaining unvested award vests at each vesting date, which is January 10.
- (6) 20% of remaining unvested award vests at each vesting date, which is January 10.
- (7) 20% of remaining unvested award vests at each vesting date, which is October 2.
- (8) 20% of remaining unvested award vests at each vesting date, which is December 1.
- (9) 20% of remaining unvested award vests at each vesting date, which is December 21.
50,000 shares of the remaining unvested award vested on January 10, 2007, 50,000 shares vested on March 1, 2007 under an
- (10) acceleration clause related to the achievement of certain quarterly financial objectives in 2006, and 50,000 shares will vest on January 10, 2008.
- (11) Unvested restricted stock award shares that will not vest and have been cancelled due to Mr. Sportsman' s separation from the Company.

Option Exercises and Stock Vested Table

The following table summarizes the total number of stock awards that were acquired on vesting in the 2006 fiscal year by the executive officers named in the Summary Compensation Table:

Name	Stock Awards	
	Number of Shares Acquired on Vesting (1)	Value Realized on Vesting (2)
Michael D. Dale	50,000	\$ 145,500
Michael R. Kramer	–	–
Deborah K. Chapman	750	\$ 2,183
John R. Judd	12,500	\$ 36,375
Richard A. Curtis	7,500	\$ 21,825
Marc R. Sportsman	5,000	\$ 14,550
Terrie Ajamil	5,000	\$ 14,550

(1) Consists of common stock of the Company issued under restricted stock unit awards which vested on January 10, 2006.

(2) Value realized on vesting is based on the closing market price of the Company's common stock on the vesting date, January 10, 2006, of \$2.91. per share

Employment Agreements and Potential Payments Upon Termination or Change in Control

Employment Agreement with Michael D. Dale. Michael D. Dale has served as our President and Chief Executive Officer since October 2002 pursuant to an employment agreement dated September 18, 2002. Mr. Dale's initial annual base salary under the agreement was \$250,000, which was increased to \$270,000 in 2004, and to \$350,000 in 2005. Mr. Dale's salary remained at \$350,000 in 2006. The Personnel and Compensation Committee granted a discretionary cash bonus of \$100,000 to Mr. Dale in November 2006 in recognition of Mr. Dale's many accomplishments in the last two years, including rebuilding the executive team, increasing mechanical heart valve revenues, expanding the Company's product offerings, and negotiating, executing, and closing the acquisition of 3F Therapeutics, Inc. In addition, Mr. Dale was granted an annual bonus of \$78,400 in February 2007 to reward him for the achievement of certain individual goals and a company performance objective based on net sales as established by the Board of Directors. Mr. Dale's employment agreement may be terminated at will by either party, provided that if we terminate the agreement without cause, Mr. Dale would be entitled to a severance payment equal to twelve months salary (\$350,000 as of the date of this proxy statement). The agreement also contains a non-competition obligation pursuant to which Mr. Dale agrees not to compete with us during the term of the agreement and for a period of one year following his termination.

Payments Made Upon Termination. If the employment of any of Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil is voluntarily or involuntarily terminated, they will not be entitled to any additional benefits or payments from the Company other than what has accrued and is vested under the benefit plans discussed above in this proxy statement, including under the heading "Summary Compensation Table." A voluntary or involuntary termination will not trigger an acceleration of the vesting of any outstanding stock options or restricted stock units. Upon an executive officer's voluntary or involuntary termination, he or she will forfeit their unvested restricted stock units and will have 90 days from the date of termination to exercise their stock options.

Payments Made Upon Termination of Employment Relationship with Marc Sportsman. On February 2, 2007, we agreed to terminate our employment relationship with Marc R. Sportsman, the Company's Vice President of Sales since April 2003. On March 6, 2007, we entered into a Separation Agreement with Mr. Sportsman setting forth the terms and conditions under which we would terminate our employment relationship with Mr. Sportsman. Under the Separation Agreement, Mr. Sportsman is entitled to receive the following payments: (a) as consideration for the terms contained in the Separation Agreement, including Mr. Sportsman's release of claims, his agreement to maintain the confidentiality of the Separation Agreement, and his promise to abide by the restrictive covenants in his employment agreement with the Company, Mr. Sportsman will receive 26 biweekly payments of \$9,541, the total amount of such payments to be \$248,060, less applicable withholdings for taxes; (b) the Company will pay Mr. Sportsman's health insurance premiums through February 2008; (c) the Company will accelerate the vesting of Mr.

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Sportsman's options to purchase 62,500 shares of our common stock which were granted in March 2003 and were scheduled to vest in March 2007; and (d) Mr. Sportsman will be paid a lump sum of \$53,058 on April 13, 2007.

Payments Made Upon Disability. In the event of the disability of any of Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil, the Company will pay the executive officer a disability benefit in an amount that is equal to 60% of their current annual compensation, not to exceed \$10,000 per month. The definition of disability is the same as that used for the disability plan covering all employees. The payments continue until the participant dies, ceases to have a disability, or attains the age of 65. If the employment of any of our officers who have received equity compensation awards, including Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil, is terminated due to disability, our standard stock option and restricted stock unit agreements contain terms that provide for the acceleration of any unvested stock options or restricted stock units upon disability, and the executive officer will have 12 months from the date of disability to exercise his or her stock options.

Payments Made Upon Death. In the event of death of any of Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil, the Company will make a one-time, lump sum payment to the executive officer's estate in an amount equal to one times the executive officer's annual salary, not to exceed \$150,000. No additional benefits or payments will accrue to him or her or be paid to him or her, other than what has accrued and is vested under the benefit plans discussed above in this proxy statement, including under the heading "Summary Compensation Table." If the employment of any of our officers who have received equity compensation awards, including Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil, is terminated due to death, our standard stock option and restricted stock unit agreements contain terms that provide for the acceleration of any unvested stock options or restricted stock units upon disability, and the estate of the executive officer will have 12 months from the date of death to exercise his or her stock options.

Potential Payments Upon Termination After Change-in-Control. We have entered into change-in-control agreements with Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil. The change-in-control agreements provide that if the officer's employment with the Company is terminated within 24 months after a change-in-control either by ATS Medical (other than for cause or disability), or by the officer for good reason, then the officer will be entitled to a lump-sum severance payment equal to two times the executive officer's base salary, as limited by Section 280G of the Internal Revenue Code of 1986, as amended. In addition, the executive officer is entitled to medical benefits and certain other benefits for up to 24 months following termination. "Good reason" is defined as the termination of employment as a result of a diminution in the officer's responsibilities, a reduction in salary or benefits, or a relocation of our office of more than 35 miles. A "change in control" is generally defined as an acquisition of more than 35% of our outstanding common stock by any person or group, the merger or sale of the Company or the replacement of a majority of our Board of Directors with directors not recommended by the existing Board of Directors.

If there had been a change in control of the Company as of the end of 2006 and the employment of the executive officers named in the Summary Compensation Table had been immediately terminated, Messrs. Dale, Kramer, Curtis and Sportsman and Ms. Ajamil would have been entitled to receive, pursuant to the terms of the agreements, lump sum payments, including salary and benefits, upon termination of \$728,268, \$338,703, \$436,184, \$524,392 and \$438,964, respectively.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth security ownership information pertaining to persons known by us to beneficially own more than 5% of our common stock, our directors and director nominees, the executive officers named in the Summary Compensation Table and all of our directors and executive officers as a group as of March 23, 2007.

Unless otherwise noted, the shareholders listed in the table have sole voting and investment power with respect to the shares of common stock owned by them.

Name of Beneficial Owner	Common Stock Beneficially Owned	
	Amount and Nature of Beneficial Ownership	Percent of Class Outstanding(1)
Accipiter Life Sciences Funds (2) 399 Park Avenue, 38th Floor New York, NY 10022	4,886,730	10.0%
Perceptive Life Sciences Master Fund, Ltd. (3) 850 3rd Avenue, 21st Floor New York, NY 10022	3,188,592	6.5 %
SF Capital Partners, Ltd. (4) 3600 South Lake Drive Saint Francis, WI 53235	2,692,381	5.5 %
Potomac Capital Management LLC (5) 825 Third Avenue, 33rd Floor New York, NY 10022	2,580,482	5.3 %
Maria-Teresa Ajamil (6)	151,504	*
Steven M. Anderson (6)	9,600	*
Deborah K. Chapman (6)	92,779	*
Richard A. Curtis (6)	164,480	*
Michael D. Dale (6)	566,705	1.1 %
John R. Judd (6) (7)	22,192	*
Michael R. Kramer (6)	878	*
Robert E. Munzenrider (6)	13,750	*
Eric W. Sivertson (6)	16,250	*
Theodore C. Skokos (6) (8)	3,141,946	6.4 %
Marc R. Sportsman (6) (7)	305,246	*
All directors and executive officers as a group (11 persons) (6)	4,485,331	9.0 %

* Less than 1%

(1) The ownership percentage of each person or entity is calculated based on the number of shares outstanding as of March 23, 2007, including shares subject to options exercisable within 60 days after March 23, 2007.

Reflects shares owned by five Accipiter Life Sciences funds, including Accipiter Life Sciences Fund, LP (Offshore), Ltd. (1,178,006 shares), Accipiter Life Sciences Fund, LP (1,172,094 shares), Accipiter Life Sciences Fund II, LP (651,280 shares), Accipiter Life Sciences Fund II, QP (680,990 shares), and Accipiter Life Sciences Fund II (Offshore), Ltd. (1,204,630 shares). Gabe Hoffman has voting and dispositive power with respect to the shares held by each of the Accipiter Life Sciences funds. Mr. Hoffman disclaims beneficial ownership of such shares.

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- (3) Joe Edelman has voting and dispositive power with respect to the shares held by Perceptive Life Sciences Master Fund, Ltd. Mr. Edelman disclaims beneficial ownership of such shares
- Michael A. Roth and Brian J. Stark are the Managing Members of Stark Offshore Management, LLC (“Stark Offshore”), which acts as investment manager and has sole power to direct the management of SF Capital Partners Ltd. (“SF Capital”). Through Stark Offshore,
- (4) Messrs. Roth and Stark possess voting and investment control over the shares of common stock held by SF Capital; however, Messrs. Roth and Stark disclaim beneficial ownership of these shares.
- The number of shares owned is based on a Schedule 13G filed jointly by Potomac Capital Management LLC (“Potomac LLC”), Potomac Capital Management Inc. (“Potomac”) and Paul J. Solit as of February 15, 2007. The Schedule 13G indicates that each of
- (5) Potomac LLC, Potomac and Mr. Solit has shared voting power and shared dispositive power of 2,580,482 shares of common stock. Potomac LLC is the general partner of Potomac Capital Partners LP, a private investment partnership Mr. Solit is the president and sole owner of Potomac, an investment manager, and the managing member of Potomac LLC.
- Includes the following shares that may be acquired within 60 days of March 23, 2007 through the exercise of stock options or vesting of restricted stock unit awards: Ms. Ajamil, 100,000 shares; Mr. Anderson, 5,000 shares; Ms. Chapman, 87,125 shares; Mr. Curtis, 145,000 shares; Mr. Dale, 350,000 shares; Mr. Judd, 0 shares; Mr. Kramer, 0 shares; Mr. Munzenrider, 13,750 shares; Mr. Sivertson, 16,250 shares; Mr. Skokos, 0 shares, Mr. Sportsman, 270,000 shares; and all executive officers and directors as a group, 1,014,495 shares.
- (6)
- Reflects the security ownership of Mr. Judd and Mr. Sportsman as of February 1, 2007. On June 5, 2006, Mr. Judd announced his resignation from the Company, and on February 2, 2007, Mr. Sportsman and the Company agreed to terminate Mr. Sportsman’s employment relationship with the Company.
- (7)
- (8) Mr. Skokos’ address is c/o ATS Medical, Inc., 3905 Annapolis Lane, Suite 105, Minneapolis, Minnesota 55447.

EQUITY COMPENSATION PLANS

The following table summarizes, as of December 31, 2006, the shares of our common stock subject to outstanding awards or available for future awards under our equity compensation plans and arrangements.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights	Weighted-average Exercise Price of Outstanding Options, Warrants and Rights	Number of Securities Remaining Available for Future Issuance under Equity Compensation Plans (excluding securities reflected in the first column)	
Equity Compensation Plans Approved by Shareholders	2,386,147	\$ 1.86	1,505,192	(1)
Equity Compensation Plans Not Approved by Shareholders	2,532,700	\$ 2.60	-	(2)
Total	4,918,847	\$ 2.24	1,505,192	

- (1) Includes shares remaining available under our 2000 Stock Incentive Plan (1,037,478 shares) and the 1998 Employee Stock Purchase Plan (467,714 shares).

Nearly all of the 2,532,700 shares listed consist of individual stock options granted to new executives or employees as an inducement to their employment with us. These options have an exercise price equal to the fair market value of our common stock at the time of the grant, and vest ratably over two to four year periods. Most of the options have a life of 10 years and vesting accelerates upon a change of control of the Company. We intend that these options shall not be Incentive Stock Options governed by the provisions of Section 422 of the Internal Revenue Code.

- (2)

**PROPOSAL 2 - PROPOSAL TO AMEND THE
ATS MEDICAL, INC. 2000 STOCK INCENTIVE PLAN**

The Board of Directors has adopted, subject to shareholder approval, an amendment to the Company's 2000 Stock Incentive Plan (the "Plan") to increase the number of shares of Common Stock authorized for issuance under the Plan from 3,500,000 to 5,500,000, an increase of 2,000,000 shares, all of which may be granted as stock options that qualify as incentive stock options meeting the requirements of Section 422 of the Internal Revenue Code.

The Board of Directors recommends that you vote in favor of the amendment to the Plan. If the amendment to the Plan is approved by the required number of shareholders, as described below, the amendment will be effective on May 2, 2007. If the amendment is not approved by our shareholders, it will not take effect. The proposed amendment is discussed in greater detail below. The amended version of the Plan is attached as Appendix A to this proxy statement.

Increase in Authorized Shares

The Company proposes to amend the Plan to increase the number of shares of Common Stock available for issuance pursuant to the Plan from 3,500,000 to 5,500,000, an increase of 2,000,000 shares. The Company further proposes to amend the Plan by allowing up to all of the additional 2,000,000 shares available under the Plan to be issued as stock options that qualify as incentive stock options, if these amendments are approved by the shareholders. As of December 31, 2006, 1,037,478 shares of Common Stock remained available for future grants of stock options and other awards available under the Plan. The Board of Directors believes that stock options and restricted stock units have been, and will continue to be, an important compensation element in attracting, motivating and retaining key employees. The granting of awards to employees is consistent with the Company's past practices, with practices in the industry, and is a factor in promoting the long-term development of the Company. The Board of Directors believes that the increase in authorized shares is necessary because of the need to continue to make awards under the Plan to attract, motivate and retain key employees.

Summary of the Plan

Purpose

The purpose of the Plan is to promote the interests of the Company and its shareholders by aiding the Company in attracting and retaining employees, officers, consultants, independent contractors and non-employee directors capable of assuring the future success of the Company, to offer such persons incentives to put forth maximum efforts for the success of the Company's business and to afford such persons an opportunity to acquire a proprietary interest in the Company.

Shares Authorized

Under the Plan, the aggregate number of shares that may be issued under all awards is currently 3,500,000. In addition, the number of shares available for granting incentive stock options under the Stock Incentive Plan is also currently 3,500,000. If the amendment is approved by the shareholders then the aggregate number of shares available for grant under the plan and available for granting incentive stock options will be 5,500,000.

Any shares that are used by a participant as full or partial payment to the Company of the purchase price relating to an award, or in connection with the satisfaction of tax obligations relating to an award, will again be available for granting awards (other than incentive stock options) under the Plan. In addition, if any shares covered by an award or to which an award relates are not purchased or are forfeited, or if an award otherwise terminates without delivery of any shares, then the number of shares counted against the aggregate number of shares available under the Plan with respect to such award, to the extent of any such forfeiture or termination, will again be available for granting awards under the Plan.

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Eligibility

The Plan provides for the grant of awards to any full or part-time employee, officer, consultant, independent contractor or director providing services to the Company or its affiliates. As of February 1, 2007, approximately 250 individuals were eligible to participate in the Plan.

Plan Administration

The Personnel and Compensation Committee has been designated by the Board of Directors to administer the Plan. The Personnel and Compensation Committee has the authority to establish rules for the administration of the Plan, to select the individuals to whom awards are granted, to determine the types of awards to be granted and the number of shares of common stock covered by the awards, and to set the vesting and other terms and conditions of awards. The Personnel and Compensation Committee may accelerate the vesting of awards. The Personnel and Compensation Committee also has the authority to determine whether the payment of any amounts received under any award may be deferred for federal income tax purposes.

The Personnel and Compensation Committee may delegate its powers and duties under the Plan to one or more directors or a committee of directors, subject to such terms, conditions and limitations as the Personnel and Compensation Committee may establish in its sole discretion. The board of directors may, at any time and from time to time, without any further action of the Personnel and Compensation Committee, exercise the powers and duties of the Personnel and Compensation Committee under the Plan.

Types and Terms of Awards

The Plan will permit the granting of (1) stock options, including “incentive stock options” meeting the requirements of Section 422 of the Internal Revenue Code, and “non-qualified stock options” that do not meet such requirements, (2) stock appreciation rights, or “SARs,” (3) restricted stock units, (4) performance awards, (5) other stock grants and (6) other awards valued in whole or in part by reference to or otherwise based upon the Company’s common stock (“other stock-based awards”). Awards may be granted for no cash consideration or for such minimal cash consideration as may be required by applicable law. Awards may provide that upon the grant or exercise thereof the holder will receive cash, shares, promissory notes, other securities, other awards or other property, or any combination thereof, as the Personnel and Compensation Committee determines. Awards may, in the discretion of the Personnel and Compensation Committee, be granted either alone or in addition to, in tandem with or in substitution for any other Award granted under any Company plan.

The exercise price per share under any stock option, the grant price of any SAR, and the purchase price of any security that may be purchased under any other stock-based award will not be less than 100% of the fair market value of Company common stock on the date of grant. No person may be granted any award or awards under the Plan, the value of which is based solely on an increase in the value of Company common stock after the date of grant, for more than 300,000 shares of common stock in the aggregate in any calendar year.

Stock Options

The maximum term of each stock option is seven years. The Personnel and Compensation Committee determines the time or times at which an option may be exercised in whole or in part and the method or methods by which, and the form or forms (including, without limitation, cash, shares, promissory notes, other securities, other awards or other property, or any combination thereof, having a fair market value on the exercise date equal to the relevant exercise price) in which, payment of the exercise price with respect thereto may be made or deemed to have been made.

An incentive stock option may only be granted to full or part-time employees (which includes officers and directors who are also employees), and an incentive stock option shall not be granted to an employee of an affiliate of the Company unless such affiliate is also a “subsidiary corporation” of the Company within the meaning of Section 424(f) of the Internal Revenue Code or any successor provision.

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SARs

The holder of an SAR will be entitled to receive the excess of the fair market value (calculated as of the exercise date or, if the Personnel and Compensation Committee so determines, as of any time during a specified period before or after the exercise date) of a specified number of shares over the grant price of the SAR.

Restricted Stock Units

Restricted stock units are subject to such restrictions as the Personnel and Compensation Committee may impose (including any limitations on the right to vote or the right to receive any dividends or other right or property related to such restricted stock units), which restrictions may lapse separately or in combination at such time or times, in such installments or otherwise as the Personnel and Compensation Committee may determine. Upon termination of the holder's employment during the restriction period, restricted stock units are forfeited and reacquired by the Company or its affiliates, unless the Personnel and Compensation Committee determines otherwise. Upon the lapse or waiver of restrictions and the restricted period relating to the restricted stock units evidencing the right to receive shares, such shares will be issued and delivered to the holders of the restricted stock units.

Performance Awards

Performance awards will provide their holders the right to receive payments, in whole or in part, upon the achievement of goals established by the Personnel and Compensation Committee during performance periods established by the Personnel and Compensation Committee. A performance award granted under the Plan may be denominated or payable in cash, shares of common stock, restricted stock units, other securities, other awards or other property.

Other Stock Grants

The Personnel and Compensation Committee also is authorized to grant shares without restrictions thereon as are deemed by the Personnel and Compensation Committee to be consistent with the purpose of the Plan.

Other Stock-Based Awards

The Personnel and Compensation Committee also is authorized to grant other types of awards that are denominated or payable in or otherwise related to Company common stock. The Plan provides that the Personnel and Compensation Committee shall establish the terms and conditions of such awards.

Non-Employee Director Awards

The Plan provides for automatic grants to the Company's non-employee directors of (1) 3,000 restricted stock units upon initial election to the Company's board of directors (the "Initial Grant") and (2) a number of restricted stock units equal to \$45,000 divided by the closing price of the Company's common stock on the Nasdaq Global Market on the date of grant, upon each re-election as a director at the Company annual shareholder meeting (the "Annual Grant"). In the event that a non-employee director's initial election occurs at an annual shareholder meeting, such non-employee director will receive both an Initial Grant and an Annual Grant at that time. All Initial Grants vest in full on the second anniversary of the date of grant and all Annual Grants vest in full at the earlier of (1) immediately prior to the Company's second annual shareholder meeting following the date of grant or (2) June 30 of the second year following the year of grant.

Transferability

In general, no award (other than unrestricted stock grants) and no right under any award granted under the Plan will be transferable by its recipient otherwise than by will or by the laws of descent and distribution.

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Adjustments; No Option Repricing

If any dividend or other distribution, recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase or exchange of Company common stock or other securities, issuance of warrants or other rights to purchase Company common stock or other securities or other similar corporate transaction or event affects the shares such that an adjustment is determined by the Personnel and Compensation Committee to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan, then the Personnel and Compensation Committee shall, in such manner as it may deem equitable, adjust any or all of (1) the number and type of shares (or other securities or other property) that thereafter may be made the subject of awards, (2) the number and type of shares (or other securities or other property) subject to outstanding awards and (3) the purchase or exercise price with respect to any award. Except for these adjustments, no option may be amended to reduce its initial exercise price, and no option may be canceled and replaced with an option or options having a lower exercise price.

Amendments

The Company's Board of Directors may amend, alter, suspend, discontinue or terminate the Plan at any time; provided, however, that, notwithstanding any other provision of the Plan or any award agreement, without the approval of the shareholders of the Company, no such amendment, alteration, suspension, discontinuation or termination may be made that, absent such approval: (1) would violate the rules or regulations of the Nasdaq Global Market or any securities exchange that are applicable to the Company or (2) would cause the Company to be unable, under the Internal Revenue Code, to grant incentive stock options under the Plan.

Effective Date; Term

The Plan, as amended, shall be effective when approved by the shareholders of the Company. The Plan terminates on December 31, 2010, and no awards may be granted after such date.

Historical Awards under the Stock Incentive Plan

The following table sets forth information with respect to stock option and restricted stock unit grants to the executive officers named in the Summary Compensation Table and the specified groups set forth below, each pursuant to the Plan as of February 1, 2007.

Name and Principal Position	Options Granted	Restricted Stock Units Granted
Michael D. Dale President, Chief Executive Officer and Director Nominee	350,000	240,000
Michael R. Kramer Acting Chief Financial Officer	–	20,000
Deborah K. Chapman Controller	75,625	7,500
John R. Judd Former Chief Financial Officer	–	50,000
Richard A. Curtis Vice President, Corporate Development	20,000	169,000
Marc R. Sportsman Former Vice President, Sales	20,000	59,000

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Name and Principal Position	Options Granted	Restricted Stock Units Granted
Maria-Teresa Ajamil Vice President, International Markets	–	59,000
Robert E. Munzenrider Directors Nominee	17,500	18,750
Eric W. Sivertson Director Nominee	20,000	18,750
Steven M. Anderson Director Nominee	5,000	18,750
Theodore C. Skokos Director Nominee	–	3,000
All executive officers as a group (8) persons	390,000	697,000
All non-executive directors as a group (4 persons)	42,500	59,250-
Each associate of the above-mentioned directors, executive officers or nominees	–	–
Each other person who received or is to receive 5% of such awards	–	–
All employees (other than executive officers) as a group (79 persons)	617,750	515,772

New Plan Benefits

No benefits or amounts have been granted, awarded or received under the Plan that are subject to shareholder approval. As described above, the Plan provides for each of the Company's non-employee directors to receive (1) 3,000 restricted stock units upon initial election to the board of directors and (2) a number of restricted stock units equal to \$45,000 divided by the closing price of the Company's common stock on the Nasdaq Global Market on the date of grant, upon each re-election as a director at the annual shareholder meeting. An aggregate of approximately 78,947 restricted stock units will be automatically granted to four of the Company's non-employee directors at the time of the 2007 Annual Meeting (based on the closing market price (\$2.28) of the Company's common stock on the Nasdaq Global Market on February 1, 2007). Except for such automatic fixed restricted stock unit grants to non-employee directors, the Personnel and Compensation Committee in its sole discretion will determine the number and types of awards that will be granted under the Plan. Thus, it is not possible to determine the benefits that will be received by eligible participants (other than pursuant to the automatic fixed grants to the Company's non-employee directors) if the Plan, as proposed to be amended, were to be approved by the Company's shareholders. The closing price of Company common stock on the Nasdaq Global Market on February 1, 2007 was \$2.28.

Federal Income Tax Consequences

The following is a summary of the principal U.S. federal income tax consequences generally applicable to awards under the Plan.

Options and SARs

The grant of an option or SAR is not expected to result in any taxable income for the recipient. The holder of an incentive stock option generally will have no taxable income upon exercising the incentive stock option

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(except that an alternative minimum tax and possibly a payroll tax liability may result), and the Company will not be entitled to a tax deduction when an incentive stock option is exercised but may incur a payroll tax liability.

Upon exercising a non-qualified stock option, the optionholder must recognize ordinary income equal to the excess of the fair market value of the shares of common stock acquired on the date of exercise over the exercise price, and the Company will be entitled at that time to a tax deduction for the same amount. Upon the exercise of an SAR, the amount of any cash received and the fair market value on the exercise date of any shares of common stock received are taxable to the recipient as ordinary income and are deductible by the Company.

The tax consequence to an optionholder upon a disposition of shares acquired through the exercise of an option will depend on how long the shares have been held and upon whether the shares were acquired by exercising an incentive stock option or by exercising a non-qualified stock option or SAR. Generally, there will be no tax consequences to the Company in connection with the disposition of shares acquired under an option. However, the Company may be entitled to a tax deduction in the case of a disposition of shares acquired under an incentive stock option before the applicable incentive stock option holding periods set forth in the Internal Revenue Code have been satisfied.

Other Awards

For other awards granted under the Plan that are payable in cash or shares of common stock and that are either transferable or not subject to substantial risk of forfeiture, the holder of such an award must recognize ordinary income equal to the excess of (a) the cash or the fair market value of the shares of common stock received (determined as of the date of such receipt) over (b) the amount (if any) paid for the shares of common stock by the holder of the award. In this case, the Company will be entitled at that time to a deduction for the same amount if and to the extent that amount satisfies general rules concerning deductibility of compensation.

For an award that is payable in shares of common stock that are restricted as to transferability and subject to substantial risk of forfeiture, unless a special election is made pursuant to the Internal Revenue Code, the holder of the award must recognize ordinary income equal to the excess of (x) the fair market value of the shares of common stock received (determined as of the first time the shares became transferable or not subject to substantial risk of forfeiture, whichever occurs earlier) over (y) the amount (if any) paid for the shares of common stock by the holder. In this case, the Company will be entitled at that time to a tax deduction for the same amount if and to the extent that amount is deductible.

Special Rules

Special rules may apply in the case of individuals subject to Section 16(b) of the Exchange Act. In particular, unless a special election is made pursuant to the Internal Revenue Code, shares received pursuant to the exercise of a stock option or SAR may be treated as restricted as to transferability and subject to a substantial risk of forfeiture for a period of up to six months after the date of exercise. Accordingly, the amount of any ordinary income recognized, and the amount of the Company's tax deduction, are determined as of the end of such period.

Recommendation of the ATS Board of Directors; Vote Required for Approval

The Board of Directors recommends a vote "FOR" the adoption of the amendment to the Plan. The affirmative vote of a majority of the outstanding shares of the Company common stock entitled to vote and present in person or by proxy at the 2007 Annual Meeting will be required to adopt the amendment to the Plan.

**PROPOSAL 3 – RATIFICATION OF APPOINTMENT OF
INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

The Board of Directors, based upon the recommendation of its Audit, Finance and Investment Committee, has appointed Grant Thornton LLP as its independent registered public accounting firm to examine the financial statements of the Company for the current fiscal year ending December 31, 2007 and to perform other appropriate accounting services. Grant Thornton LLP has served as the Company's independent registered public accounting firm since August 22, 2006, and has no relationship with the Company other than that arising from their employment as the Company's independent registered public accounting firm.

Ernst & Young LLP ("Ernst & Young") had served as the independent registered public accounting firm of the Company since the Company's inception. Due to concerns about the increasing costs of audit services, the Audit, Finance and Investment Committee, in the first half of 2006, requested management to solicit bids for audit services for the fiscal years 2006 through 2008. Based on the bids submitted, on August 22, 2006, the Audit, Finance and Investment Committee dismissed Ernst & Young as the Company's independent registered public accounting firm and appointed Grant Thornton LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2006.

The reports of Ernst & Young on the financial statements of the Company for the years ended December 31, 2005 and 2004 contained no adverse opinion or disclaimer of opinion and were not qualified or modified as to uncertainty, audit scope or accounting principles, except to disclose that the 2005 consolidated financial statements had been restated.

In connection with its audits for 2004 and 2005 and through August 22, 2006, there had been no disagreements (as described in Regulation S-K Item 304(a)(1)(iv)) between Ernst & Young and the Company on any matter of accounting principles or practices, financial statement disclosure or auditing scope or procedure, which disagreements, if not resolved to the satisfaction of Ernst & Young, would have caused Ernst & Young to make reference thereto in its report on the financial statements for such years.

During 2004 and 2005 and through August 22, 2006, there had been no reportable events (as outlined in Regulation S-K Item 304(a)(1)(v)), except for the following:

The audit report of Ernst & Young on management's assessment of the effectiveness of internal control over financial reporting and the effectiveness of internal control over financial reporting as of December 31, 2004 indicated that the Company did not maintain effective internal controls over financial reporting as of December 31, 2004 because of a material weakness in ATS Medical's internal controls related to ineffective application of inventory verification procedures, including cycle count procedures

On June 13, 2006, the Company's management and Audit Committee concluded that the Company's previously filed financial statements for the year ended December 31, 2005 and the quarter ended March 31, 2006 should no longer be relied upon and should be restated to reflect separate accounting for embedded derivatives within the Company's 6% Convertible Senior Notes due 2025 (the "Notes"). In addition management concluded that the failure to correctly apply FASB Statement No. 133 and its related interpretations and rules with respect to the embedded derivative accounting treatment of the Notes constituted a material weakness in the Company's internal control over financial reporting. The Company subsequently filed an amendment to its Form 10-K for the year ended December 31, 2005. Ernst & Young's audit report on the effectiveness of internal control over financial reporting concluded that the Company did not maintain effective internal control over financial reporting as of December 31, 2005.

The Audit, Finance and Investment Committee discussed each of the foregoing reportable events with Ernst & Young. The Audit, Finance and Investment Committee has authorized Ernst & Young to respond fully to any inquiries from Grant Thornton LLP concerning the foregoing reportable events.

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While the Company is not required to do so, the Company is submitting the appointment of Grant Thornton LLP to serve as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2007 for ratification in order to ascertain the views of the Company's shareholders on this appointment. If the appointment is not ratified, the Audit, Finance and Investment Committee will reconsider its selection.

Representatives of Grant Thornton LLP will be present at the 2007 Annual Meeting of Shareholders, will have an opportunity to make a statement if they desire to do so and will be available to respond to appropriate questions from shareholders.

The Board of Directors recommends a vote "FOR" the ratification of Grant Thornton LLP as the Company's independent registered public accounting firm. The affirmative vote of a majority of the outstanding shares of Common Stock entitled to vote and present in person or by proxy at the Annual Meeting will be required to ratify the appointment. Proxies will be voted in favor of the ratification of the appointment unless otherwise specified.

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FEES

Grant Thornton LLP, our independent registered public accounting firm, provides both audit and non-audit services to us. The fee table below reports fees billed or to be billed to us for professional services provided to us during 2006 by Grant Thornton LLP and during 2005 by Ernst & Young LLP, the Company's former independent registered public accounting firm. Based in part on its review of the nature and value of services provided by Grant Thornton LLP, our Audit, Finance and Investment Committee has concluded that the provision of non-audit services is compatible with maintaining Grant Thornton LLP's independence. The Audit, Finance and Investment Committee has approved, pursuant to its pre-approval policies described below, 100% of the services listed below.

	<u>2006</u>	<u>2005</u>
Audit Fees (1)	\$254,700	\$320,000
Audit-Related Fees (2)	\$12,000	-
Tax Fees	-	-
All Other Fees	-	-
Total Fees	<u>\$266,700</u>	<u>\$320,000</u>

- Audit fees for 2006 do not include \$34,500 audit fees paid to Ernst & Young LLP for the first and second quarterly reviews, \$30,000 for the restatement of the 2005 financial statements related to the separate accounting for embedded derivatives discussed above and \$86,702 for related S-3, S-4 and S-8 filings.
- (1) Audit fees for 2006 do not include \$34,500 audit fees paid to Ernst & Young LLP for the first and second quarterly reviews, \$30,000 for the restatement of the 2005 financial statements related to the separate accounting for embedded derivatives discussed above and \$86,702 for related S-3, S-4 and S-8 filings.
 - (2) Audited-related fees for 2006 do not include \$12,000 audit-related fees paid to Ernst & Young LLP for transition services.

All services provided by our independent registered public accounting firm, Grant Thornton LLP, are subject to pre-approval by our Audit, Finance and Investment Committee. The Audit, Finance and Investment Committee has authorized the Chair of the Audit, Finance and Investment Committee to approve services by Grant Thornton LLP in the event there is a need for such approval prior to the next Audit, Finance and Investment Committee meeting. However, a full report of any such interim approvals must be given at the next Audit, Finance and Investment Committee meeting. Before granting any approval, the Audit, Finance and Investment Committee (or the committee Chair, if applicable) must receive: (1) a detailed description of the proposed service; (2) a statement from management as to why they believe Grant Thornton LLP is best qualified to perform the service; and (3) an estimate of the fees to be incurred. Before granting any approval, the Audit, Finance and Investment

Committee (or the committee Chair, if applicable) gives due consideration to whether approval of the proposed service will have a detrimental impact on Grant Thornton LLP's independence.

PROPOSALS FOR THE 2008 ANNUAL MEETING

Any proposal by a shareholder to be included in the Company's proxy material and presented at the 2008 Annual Meeting of Shareholders must be received at the Company's principal executive offices, 3905 Annapolis Lane, Suite 105, Minneapolis, Minnesota 55447, Attention: Corporate Secretary, no later than December 12, 2007. In addition, in connection with any matter to be proposed by a shareholder at the 2008 Annual Meeting, but not proposed for inclusion in the Company's proxy materials, the proxy holders designated by the Company for that meeting may exercise their discretionary voting authority with respect to that shareholder proposal if appropriate notice of that proposal is not received by the Secretary of the Company at its principal executive office by February 25, 2008.

ANNUAL REPORT ON FORM 10-K

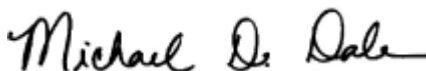
The Company's Annual Report on Form 10-K, including financial statements for the year ended December 31, 2006, accompanies, or has been mailed to you immediately prior to, this proxy statement. The Annual Report on Form 10-K is also available on the Company's website at www.atsmedical.com. If requested, the Company will provide you copies of any exhibits to the Form 10-K upon the payment of a fee covering the Company's reasonable expenses in furnishing the exhibits. You can request exhibits to the Form 10-K by writing to the Company's Corporate Secretary at ATS Medical, Inc., 3905 Annapolis Lane, Suite 105, Minneapolis, Minnesota 55447.

OTHER MATTERS

The Board of Directors of the Company does not know of any other business to come before the 2007 Annual Meeting of Shareholders. If any other matters are properly brought before the meeting, however, the persons named in the accompanying proxy will vote in accordance with their best judgment.

Your cooperation in giving this matter your immediate attention and in returning your proxy promptly will be appreciated.

By Order of the Board of Directors,



Michael D. Dale
Chief Executive Officer

April 10, 2007

ATS MEDICAL, INC.

2000 STOCK INCENTIVE PLAN, AS PROPOSED TO BE AMENDED

Section 1. Purpose.

The purpose of the Plan is to promote the interests of the Company and its shareholders by aiding the Company in attracting and retaining employees, officers, consultants, independent contractors and non-employee directors capable of assuring the future success of the Company, to offer such persons incentives to put forth maximum efforts for the success of the Company's business and to afford such persons an opportunity to acquire a proprietary interest in the Company.

Section 2. Definitions.

As used in the Plan, the following terms shall have the meanings set forth below:

(a) "Affiliate" shall mean (i) any entity that, directly or indirectly through one or more intermediaries, is controlled by the Company and (ii) any entity in which the Company has a significant equity interest, in each case as determined by the Committee.

(b) "Award" shall mean any Option, Stock Appreciation Right, Restricted Stock Unit, Performance Award, Other Stock Grant or Other Stock-Based Award granted under the Plan.

(c) "Award Agreement" shall mean any written agreement, contract or other instrument or document evidencing any Award granted under the Plan.

(d) "Board" shall mean the Board of Directors of the Company.

(e) "Code" shall mean the Internal Revenue Code of 1986, as amended from time to time, and any regulations promulgated thereunder.

(f) "Committee" shall mean a committee of Directors designated by the Board to administer the Plan. The Committee shall be comprised of not less than such number of Directors as shall be required to permit Awards granted under the Plan to qualify under Rule 16b-3, and each member of the Committee shall be a "Non-Employee Director" within the meaning of Rule 16b-3 and an "outside director" within the meaning of Section 162(m) of the Code. The Company expects to have the Plan administered in accordance with the requirements for the award of "qualified performance-based compensation" within the meaning of Section 162(m) of the Code.

(g) "Company" shall mean ATS Medical, Inc., a Minnesota corporation, and any successor corporation.

(h) "Director" shall mean a member of the Board.

(i) "Eligible Person" shall mean any employee, officer, consultant, independent contractor or Director providing services to the Company or any Affiliate whom the Committee determines to be an Eligible Person.

(j) "Fair Market Value" shall mean, with respect to any property (including, without limitation, any Shares or other securities), the fair market value of such property determined by such methods or procedures as shall be established from time to time by the Committee. Notwithstanding the foregoing, unless otherwise determined by the Committee, the Fair Market Value of Shares as of a given date shall be, if the Shares are then quoted on the NASDAQ Global Market System, the closing price as reported on the NASDAQ Global Market System on such

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date or, if the NASDAQ Global Market System is not open for trading on such date, on the most recent preceding date when it is open for trading.

(k) “Incentive Stock Option” shall mean an option granted under Section 6(a) of the Plan that is intended to meet the requirements of Section 422 of the Code or any successor provision.

(l) “Non-Qualified Stock Option” shall mean an option granted under Section 6(a) of the Plan that is not intended to be an Incentive Stock Option.

(m) “Option” shall mean an Incentive Stock Option or a Non-Qualified Stock Option.

(n) “Other Stock Grant” shall mean any right granted under Section 6(e) of the Plan.

(o) “Other Stock-Based Award” shall mean any right granted under Section 6(f) of the Plan.

(p) “Participant” shall mean an Eligible Person designated to be granted an Award under the Plan.

(q) “Performance Award” shall mean any right granted under Section 6(d) of the Plan.

(r) “Person” shall mean any individual, corporation, partnership, association or trust.

(s) “Plan” shall mean the ATS Medical, Inc. 2000 Stock Incentive Plan, as amended from time to time, the provisions of which are set forth herein.

(t) “Restricted Stock Unit” shall mean any unit granted under Section 6(c) of the Plan evidencing the right to receive a Share (or a cash payment equal to the Fair Market Value of a Share) at some future date.

(u) “Rule 16b-3” shall mean Rule 16b-3 promulgated by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as amended, or any successor rule or regulation.

(v) “Shares” shall mean shares of Common Stock, \$.01 par value per share, of the Company or such other securities or property as may become subject to Awards pursuant to an adjustment made under Section 4(c) of the Plan.

(w) “Stock Appreciation Right” shall mean any right granted under Section 6(b) of the Plan.

Section 3. Administration.

(a) Power and Authority of the Committee. The Plan shall be administered by the Committee. Subject to the express provisions of the Plan and to applicable law, the Committee shall have full power and authority to: (i) designate Participants; (ii) determine the type or types of Awards to be granted to each Participant under the Plan; (iii) determine the number of Shares to be covered by (or with respect to which payments, rights or other matters are to be calculated in connection with) each Award; (iv) determine the terms and conditions of any Award or Award Agreement; (v) amend the terms and conditions of any Award or Award Agreement and accelerate the exercisability of Options or the lapse of restrictions relating to Restricted Stock Units or other Awards; (vi) determine whether, to what extent and under what circumstances Awards may be exercised in cash, Shares, other securities, other Awards or other property, or canceled, forfeited or suspended; (vii) determine whether, to what extent and under what circumstances cash, Shares, promissory notes, other securities, other Awards, other property and other amounts payable with respect to an Award under the Plan shall be deferred either automatically or at the election of the holder thereof or the Committee; (viii) interpret and administer the Plan and any instrument or agreement, including an Award Agreement, relating to the Plan; (ix) establish, amend, suspend or waive such rules and regulations and appoint such agents as it shall deem appropriate for the proper administration of the Plan; and (x) make any other determination and take any other action that the Committee deems necessary or desirable for the administration of the Plan. Unless otherwise expressly provided in the Plan, all designations, determinations, interpretations and other decisions under or with respect to the Plan or any Award shall be within the sole discretion

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of the Committee, may be made at any time and shall be final, conclusive and binding upon any Participant, any holder or beneficiary of any Award and any employee of the Company or any Affiliate.

(b) Delegation. The Committee may delegate its powers and duties under the Plan to one or more Directors or a committee of Directors, subject to such terms, conditions and limitations as the Committee may establish in its sole discretion.

(c) Power and Authority of the Board of Directors. Notwithstanding anything to the contrary contained herein, the Board may, at any time and from time to time, without any further action of the Committee, exercise the powers and duties of the Committee under the Plan.

Section 4. Shares Available for Awards.

(a) Shares Available. Subject to adjustment as provided in Section 4(c) of the Plan, the aggregate number of Shares that may be issued under all Awards under the Plan shall be 5,500,000. Shares to be issued under the Plan may be either authorized but unissued Shares or Shares acquired in the open market or otherwise. Any Shares that are used by a Participant as full or partial payment to the Company of the purchase price relating to an Award, or in connection with the satisfaction of tax obligations relating to an Award, shall again be available for granting Awards (other than Incentive Stock Options) under the Plan. In addition, if any Shares covered by an Award or to which an Award relates are not purchased or are forfeited, or if an Award otherwise terminates without delivery of any Shares, then the number of Shares counted against the aggregate number of Shares available under the Plan with respect to such Award, to the extent of any such forfeiture or termination, shall again be available for granting Awards under the Plan. Notwithstanding the foregoing, the number of Shares available for granting Incentive Stock Options under the Plan shall not exceed 5,500,000, subject to adjustment as provided in the Plan and subject to the provisions of Section 422 or 424 of the Code or any successor provision.

(b) Accounting for Awards. For purposes of this Section 4, if an Award entitles the holder thereof to receive or purchase Shares, the number of Shares covered by such Award or to which such Award relates shall be counted on the date of grant of such Award against the aggregate number of Shares available for granting Awards under the Plan.

(c) Adjustments. In the event that the Committee shall determine that any dividend or other distribution (whether in the form of cash, Shares, other securities or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase or exchange of Shares or other securities of the Company, issuance of warrants or other rights to purchase Shares or other securities of the Company or other similar corporate transaction or event affects the Shares such that an adjustment is determined by the Committee to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan, then the Committee shall, in such manner as it may deem equitable, adjust any or all of (i) the number and type of Shares (or other securities or other property) that thereafter may be made the subject of Awards, (ii) the number and type of Shares (or other securities or other property) subject to outstanding Awards and (iii) the purchase or exercise price with respect to any Award; provided, however, that the number of Shares covered by any Award or to which such Award relates shall always be a whole number.

(d) Award Limitations Under the Plan. No Eligible Person may be granted any Award or Awards under the Plan, the value of which Award or Awards is based solely on an increase in the value of the Shares after the date of grant of such Award or Awards, for more than 300,000 Shares (subject to adjustment as provided for in Section 4(c) of the Plan), in the aggregate in any calendar year. The foregoing annual limitation specifically includes the grant of any Award or Awards representing “qualified performance-based compensation” within the meaning of Section 162(m) of the Code.

Section 5. Eligibility.

Any Eligible Person shall be eligible to be designated a Participant. In determining which Eligible Persons shall receive an Award and the terms of any Award, the Committee may take into account the nature of the services

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rendered by the respective Eligible Persons, their present and potential contributions to the success of the Company or such other factors as the Committee, in its discretion, shall deem relevant. Notwithstanding the foregoing, an Incentive Stock Option may only be granted to full or part-time employees (which term as used herein includes, without limitation, officers and Directors who are also employees), and an Incentive Stock Option shall not be granted to an employee of an Affiliate unless such Affiliate is also a “subsidiary corporation” of the Company within the meaning of Section 424(f) of the Code or any successor provision.

Section 6. Awards.

(a) Options. The Committee is hereby authorized to grant Options to Participants with the following terms and conditions and with such additional terms and conditions not inconsistent with the provisions of the Plan as the Committee shall determine:

(i) Exercise Price. The purchase price per Share for Options granted under the Plan shall be determined by the Committee; provided, however, that such purchase price shall not be less than 100% of the Fair Market Value of the Shares on the date of grant of such Option unless shareholder approval is obtained.

(ii) Option Term. The term of each Option shall be fixed by the Committee, but such term shall not exceed 7 years from the date on which such Option is granted.

(iii) Time and Method of Exercise. The Committee shall determine the time or times at which an Option may be exercised in whole or in part and the method or methods by which, and the form or forms (including, without limitation, cash, Shares, promissory notes, other securities, other Awards or other property, or any combination thereof, having a Fair Market Value on the exercise date equal to the relevant exercise price) in which, payment of the exercise price with respect thereto may be made or deemed to have been made.

(b) Stock Appreciation Rights. The Committee is hereby authorized to grant Stock Appreciation Rights to Participants subject to the terms of the Plan and any applicable Award Agreement. A Stock Appreciation Right granted under the Plan shall confer on the holder thereof a right to receive upon exercise thereof the excess of (i) the Fair Market Value of one Share on the date of exercise (or, if the Committee shall so determine, at any time during a specified period before or after the date of exercise) over (ii) the grant price of the Stock Appreciation Right as specified by the Committee, which price shall not be less than 100% of the Fair Market Value of one Share on the date of grant of the Stock Appreciation Right. Subject to the terms of the Plan and any applicable Award Agreement, the grant price, term, methods of exercise, dates of exercise, methods of settlement and any other terms and conditions of any Stock Appreciation Right shall be as determined by the Committee. The Committee may impose such conditions or restrictions on the exercise of any Stock Appreciation Right as it may deem appropriate.

(c) Restricted Stock Units. The Committee is hereby authorized to grant Restricted Stock Units to Participants with the following terms and conditions and with such additional terms and conditions not inconsistent with the provisions of the Plan as the Committee shall determine:

(i) Restrictions. Restricted Stock Units shall be subject to such restrictions as the Committee may impose (including, without limitation, a waiver by the Participant of the right to vote or to receive any dividend or other right or property with respect thereto), which restrictions may lapse separately or in combination at such time or times, in such installments or otherwise as the Committee may deem appropriate.

(ii) Stock Certificates. No Shares shall be issued at the time Restricted Stock Units are granted.

(iii) Forfeiture. Except as otherwise determined by the Committee, upon termination of employment (as determined under criteria established by the Committee) during the applicable restriction period, all Restricted Stock Units at such time subject to restriction shall be forfeited and reacquired by the

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Company; provided, however, that the Committee may, when it finds that a waiver would be in the best interest of the Company, waive in whole or in part any or all remaining restrictions with respect to Restricted Stock Units. Upon the lapse or waiver of restrictions and the restricted period relating to Restricted Stock Units evidencing the right to receive Shares, such Shares shall be issued and delivered to the holders of the Restricted Stock Units.

(d) Performance Awards. The Committee is hereby authorized to grant Performance Awards to Participants subject to the terms of the Plan and any applicable Award Agreement. A Performance Award granted under the Plan (i) may be denominated or payable in cash, Shares (including, without limitation, Restricted Stock Units), other securities, other Awards or other property and (ii) shall confer on the holder thereof the right to receive payments, in whole or in part, upon the achievement of such performance goals during such performance periods as the Committee shall establish. Subject to the terms of the Plan and any applicable Award Agreement, the performance goals to be achieved during any performance period, the length of any performance period, the amount of any Performance Award granted, the amount of any payment or transfer to be made pursuant to any Performance Award and any other terms and conditions of any Performance Award shall be determined by the Committee.

(e) Other Stock Grants. The Committee is hereby authorized, subject to the terms of the Plan and any applicable Award Agreement, to grant to Participants Shares without restrictions thereon as are deemed by the Committee to be consistent with the purpose of the Plan.

(f) Other Stock-Based Awards. The Committee is hereby authorized to grant to Participants subject to the terms of the Plan and any applicable Award Agreement, such other Awards that are denominated or payable in, valued in whole or in part by reference to, or otherwise based on or related to, Shares (including, without limitation, securities convertible into Shares), as are deemed by the Committee to be consistent with the purpose of the Plan. Shares or other securities delivered pursuant to a purchase right granted under this Section 6(f) shall be purchased for such consideration, which may be paid by such method or methods and in such form or forms (including, without limitation, cash, Shares, promissory notes, other securities, other Awards or other property or any combination thereof), as the Committee shall determine, the value of which consideration, as established by the Committee, shall not be less than 100% of the Fair Market Value of such Shares or other securities as of the date such purchase right is granted.

(g) General.

(i) No Cash Consideration for Awards. Awards shall be granted for no cash consideration or for such minimal cash consideration as may be required by applicable law.

(ii) Awards May Be Granted Separately or Together. Awards may, in the discretion of the Committee, be granted either alone or in addition to, in tandem with or in substitution for any other Award or any award granted under any plan of the Company or any Affiliate other than the Plan. Awards granted in addition to or in tandem with other Awards or in addition to or in tandem with awards granted under any such other plan of the Company or any Affiliate may be granted either at the same time as or at a different time from the grant of such other Awards or awards.

(iii) Forms of Payment under Awards. Subject to the terms of the Plan and of any applicable Award Agreement, payments or transfers to be made by the Company or an Affiliate upon the grant, exercise or payment of an Award may be made in such form or forms as the Committee shall determine (including, without limitation, cash, Shares, promissory notes, other securities, other Awards or other property or any combination thereof), and may be made in a single payment or transfer, in installments or on a deferred basis, in each case in accordance with rules and procedures established by the Committee. Such rules and procedures may include, without limitation, provisions for the payment or crediting of reasonable interest on installment or deferred payments or the grant or crediting of dividend equivalents with respect to installment or deferred payments.

(iv) Limits on Transfer of Awards. No Award (other than Other Stock Grants) and no right under any such Award shall be transferable by a Participant otherwise than by will or by the laws of descent and distribution; provided, however, that, if so determined by the Committee, a Participant may, in

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the manner established by the Committee, transfer Options (other than Incentive Stock Options) or designate a beneficiary or beneficiaries to exercise the rights of the Participant and receive any property distributable with respect to any Award upon the death of the Participant. Each Award or right under any Award shall be exercisable during the Participant's lifetime only by the Participant or, if permissible under applicable law, by the Participant's guardian or legal representative. No Award or right under any such Award may be pledged, alienated, attached or otherwise encumbered, and any purported pledge, alienation, attachment or encumbrance thereof shall be void and unenforceable against the Company or any Affiliate.

(v) Term of Awards. The term of each Award shall be for such period as may be determined by the Committee; provided, however, that the term of an Option shall not exceed 7 years from the date on which such Option is granted.

(vi) Restrictions; Securities Exchange Listing. All Shares or other securities delivered under the Plan pursuant to any Award or the exercise thereof shall be subject to such restrictions as the Committee may deem advisable under the Plan, applicable federal or state securities laws and regulatory requirements, and the Committee may cause appropriate entries to be made or legends to be affixed to reflect such restrictions. If any securities of the Company are traded on a securities exchange, the Company shall not be required to deliver any Shares or other securities covered by an Award unless and until such Shares or other securities have been admitted for trading on such securities exchange.

Section 7. Automatic Grants to Non-Employee Directors.

Upon his or her initial election to the Board, each non-employee director of the Company shall receive 3,000 Restricted Stock Units (the "Initial Grant"). In addition, upon each election of such person as a director at the Company's annual shareholder meeting, each non-employee director shall receive a number of Restricted Stock Units equal to \$45,000 divided by the Fair Market Value of one share of the Company's common stock on the date of grant (the "Annual Grant"). In the event that a non-employee director's initial election to the Board occurs at the Company's annual shareholder meeting, such non-employee director will receive both an Initial Grant and an Annual Grant at that time. All Initial Grants shall vest in full on the second anniversary of the date of grant. All Annual Grants shall vest in full at the earlier of (1) immediately prior to the Company's second annual shareholder meeting following the date of grant or (2) June 30 of the second year following the year of grant. When a non-employee director ceases to serve as a director of the Company, all Restricted Stock Units granted to such non-employee director and still subject to restriction at the date of his or her termination as a director shall be forfeited and reacquired by the Company as of that date. This Section 7 may not be amended more than once every six months, other than to comport with changes in the Code or the rules thereunder.

Section 8. Amendment and Termination; Adjustments.

(a) Amendments to the Plan. The Board may amend, alter, suspend, discontinue or terminate the Plan at any time; provided, however, that, notwithstanding any other provision of the Plan or any Award Agreement, without the approval of the shareholders of the Company, no such amendment, alteration, suspension, discontinuation or termination shall be made that, absent such approval: (i) would violate the rules or regulations of the NASDAQ Global Market System or any securities exchange that are applicable to the Company; or (ii) would cause the Company to be unable, under the Code, to grant Incentive Stock Options under the Plan.

(b) Amendments to Awards. Except for Awards granted pursuant to Section 7, the Committee may waive any conditions of or rights of the Company under any outstanding Award, prospectively or retroactively. Except as otherwise provided herein or in the Award Agreement, the Committee may not amend, alter, suspend, discontinue or terminate any outstanding Award, prospectively or retroactively, if such action would adversely affect the rights of the holder of such Award, without the consent of the Participant or holder or beneficiary thereof.

(c) Prohibition on Option Repricing. The Committee shall not reduce the exercise price of any outstanding Option, whether through amendment, cancellation or replacement grants, or any other means, without shareholder approval.

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(d) Correction of Defects, Omissions and Inconsistencies. The Committee may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem desirable to carry the Plan into effect.

Section 9. Income Tax Withholding; Tax Bonuses.

(a) Withholding. In order to comply with all applicable federal or state income tax laws or regulations, the Company may take such action as it deems appropriate to ensure that all applicable federal or state payroll, withholding, income or other taxes, which are the sole and absolute responsibility of a Participant, are withheld or collected from such Participant. In order to assist a Participant in paying all or a portion of the federal and state taxes to be withheld or collected upon exercise or receipt of (or the lapse of restrictions relating to) an Award, the Committee, in its discretion and subject to such additional terms and conditions as it may adopt, may permit the Participant to satisfy such tax obligation by (i) electing to have the Company withhold a portion of the Shares otherwise to be delivered upon exercise or receipt of (or the lapse of restrictions relating to) such Award with a Fair Market Value equal to the amount of such taxes or (ii) delivering to the Company Shares other than Shares issuable upon exercise or receipt of (or the lapse of restrictions relating to) such Award with a Fair Market Value equal to the amount of such taxes. The election, if any, must be made on or before the date that the amount of tax to be withheld is determined.

(b) Tax Bonuses. The Committee, in its discretion, shall have the authority, at the time of grant of any Award under this Plan or at any time thereafter, to approve cash bonuses to designated Participants to be paid upon their exercise or receipt of (or the lapse of restrictions relating to) Awards in order to provide funds to pay all or a portion of federal and state taxes due as a result of such exercise or receipt (or the lapse of such restrictions). The Committee shall have full authority in its discretion to determine the amount of any such tax bonus.

Section 10. General Provisions.

(a) No Rights to Awards. No Eligible Person, Participant or other Person shall have any claim to be granted any Award under the Plan, and there is no obligation for uniformity of treatment of Eligible Persons, Participants or holders or beneficiaries of Awards under the Plan. The terms and conditions of Awards need not be the same with respect to any Participant or with respect to different Participants.

(b) Award Agreements. No Participant will have rights under an Award granted to such Participant unless and until an Award Agreement shall have been duly executed on behalf of the Company and, if requested by the Company, signed by the Participant.

(c) No Limit on Other Compensation Arrangements. Nothing contained in the Plan shall prevent the Company or any Affiliate from adopting or continuing in effect other or additional compensation arrangements, and such arrangements may be either generally applicable or applicable only in specific cases.

(d) No Right to Employment. The grant of an Award shall not be construed as giving a Participant the right to be retained in the employ of the Company or any Affiliate, nor will it affect in any way the right of the Company or an Affiliate to terminate such employment at any time, with or without cause. In addition, the Company or an Affiliate may at any time dismiss a Participant from employment free from any liability or any claim under the Plan or any Award, unless otherwise expressly provided in the Plan or in any Award Agreement.

(e) Governing Law. The validity, construction and effect of the Plan or any Award, and any rules and regulations relating to the Plan or any Award, shall be determined in accordance with the laws of the State of Minnesota.

(f) Severability. If any provision of the Plan or any Award is or becomes or is deemed to be invalid, illegal or unenforceable in any jurisdiction or would disqualify the Plan or any Award under any law deemed applicable by the Committee, such provision shall be construed or deemed amended to conform to applicable laws, or if it cannot be so construed or deemed amended without, in the determination of the Committee, materially

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altering the purpose or intent of the Plan or the Award, such provision shall be stricken as to such jurisdiction or Award, and the remainder of the Plan or any such Award shall remain in full force and effect.

(g) No Trust or Fund Created. Neither the Plan nor any Award shall create or be construed to create a trust or separate fund of any kind or a fiduciary relationship between the Company or any Affiliate and a Participant or any other Person. To the extent that any Person acquires a right to receive payments from the Company or any Affiliate pursuant to an Award, such right shall be no greater than the right of any unsecured general creditor of the Company or any Affiliate.

(h) No Fractional Shares. No fractional Shares shall be issued or delivered pursuant to the Plan or any Award, and the Committee shall determine whether cash shall be paid in lieu of any fractional Shares or whether such fractional Shares or any rights thereto shall be canceled, terminated or otherwise eliminated.

(i) Headings. Headings are given to the Sections and subsections of the Plan solely as a convenience to facilitate reference. Such headings shall not be deemed in any way material or relevant to the construction or interpretation of the Plan or any provision thereof.

Section 11. Effective Date of the Plan.

The Plan, as amended, shall be effective when approved by the shareholders of the Company.

Section 12. Term of the Plan.

No Award shall be granted under the Plan after December 31, 2010 or any earlier date of discontinuation or termination established pursuant to Section 8(a) of the Plan. However, unless otherwise expressly provided in the Plan or in an applicable Award Agreement, any Award theretofore granted may extend beyond such date.



ATS MEDICAL, INC.

ANNUAL MEETING OF SHAREHOLDERS

Tuesday, May 22, 2007

4:00 p.m.

OFFICES OF DORSEY & WHITNEY LLP

Suite 1500, 50 South Sixth Street

Minneapolis, Minnesota



ATS MEDICAL, INC.
3905 Annapolis Lane
Minneapolis, Minnesota 55447

proxy

THIS PROXY IS SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS

The undersigned, having duly received the Notice of Annual Meeting and Proxy Statement dated April 10, 2007, appoints Deborah K. Chapman and Michael R. Kramer proxies (each with the power to act alone and with the power of substitution and revocation) to represent the undersigned and to vote, as designated on the matters shown on the reverse side, all shares of common stock of ATS Medical, Inc. which the undersigned is entitled to vote at the 2007 Annual Meeting of Shareholders of ATS Medical, Inc., to be held on Tuesday, May 22, 2007 at the offices of Dorsey & Whitney LLP, Suite 1500, 50 South Sixth Street, Minneapolis, Minnesota at 4:00 p.m. and any adjournment thereof.

See reverse for voting instructions.

There are three ways to vote your Proxy

Your telephone or Internet vote authorizes the Named Proxies to vote your shares in the same manner as if you marked, signed and returned your proxy card.

COMPANY #

VOTE BY PHONE – TOLL

FREE – 1-800-560-1965 – QUICK ★★★ EASY ★★★ IMMEDIATE

Use any touch-tone telephone to vote your proxy 24 hours a day, 7 days a week, until 12:00 p.m. (CT) on May 21, 2007.

Please have your proxy card and the last four digits of your Social Security Number or Tax Identification Number available. Follow the simple instructions the recording provides you.

VOTE BY INTERNET – <http://www.eproxy.com/atsi/> – QUICK ★★★ EASY ★★★ IMMEDIATE

Use the Internet to vote your proxy 24 hours a day, 7 days a week, until 12:00 p.m. (CT) on May 21, 2007.

Please have your proxy card and the last four digits of your Social Security Number or Tax Identification Number available. Follow the simple instructions to obtain your records and create an electronic ballot.

VOTE BY MAIL

Mark, sign and date your proxy card and return it in the postage-paid envelope we've provided or return it to **ATS Medical, Inc.**, c/o Shareowner ServicesSM, P.O. Box 64873, St. Paul, MN 55164-0873.

If you vote by Phone or Internet, please do not mail your Proxy Card

The Board of Directors Recommends a Vote FOR Items 1, 2 and 3.

- | | | | | |
|---------------------------|-----------------------|--------------------------|---|-----------------------------------|
| 1. Election of directors: | 01 Michael D. Dale | 04 Robert E. Munzenrider | <input type="checkbox"/> FOR all nominees | <input type="checkbox"/> WITHHOLD |
| | 02 Steven M. Anderson | 05 Theodore C. Skokos | listed to the left | AUTHORITY to vote for |
| | 03 Eric W. Sivertson | | (except as marked to | the nominees indicated |
| | | | the contrary below) | below |

(Instructions: To withhold authority to vote for any indicated nominee, write the number(s) of the nominee(s) in the box provided to the right.)

⤴Please fold here⤵

2. Amendment to the 2000 Stock Incentive Plan (the "Plan") to increase the number of shares of common stock of the Company available for awards granted under the Plan by 2,000,000 shares. For Against Abstain
3. Ratification of Grant Thornton LLP as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2007. For Against Abstain

THIS PROXY, WHEN PROPERLY EXECUTED, WILL BE VOTED IN THE MANNER DIRECTED HEREIN BY THE UNDERSIGNED SHAREHOLDER. IF NO DIRECTION IS MADE, THIS PROXY WILL BE VOTED FOR EACH PROPOSAL AND IN THE DISCRETION OF THE NAMED PROXIES ON ALL OTHER MATTERS.

Address Change? Mark Box Indicate changes below:

Date _____

Signature(s) in Box

Please sign exactly as your name appears hereon. Jointly owned shares will be voted as directed if one owner signs unless another

owner instructs to the contrary, in which case the shares will not be voted. If signing in a representative capacity, please indicate title and authority.