

FINAL PROSPECTUS

73,114,592 SHARES OF COMMON STOCK



This prospectus relates to the resale, from time to time, of up to an aggregate of 73,114,592 shares of common stock, par value \$0.000001 per share, of Xtant Medical Holdings, Inc. by the selling stockholders named in this prospectus, including their respective donees, pledgees, assignees, transferees, distributees or other successors-in-interest. The selling stockholders acquired these shares from ROS Acquisition Offshore LP, Royalty Opportunities S.à.r.l and OrbiMed Royalty Opportunities II, LP on April 15, 2025 pursuant to a Stock Purchase Agreement privately negotiated and entered into among such parties on April 10, 2025.

We are not selling any shares of our common stock under this prospectus and will not receive any proceeds from sales of the shares offered by the selling stockholders, although we will incur expenses in connection with the offering. The registration of the resale of the shares of common stock covered by this prospectus does not necessarily mean that any of the shares will be offered or sold by the selling stockholders. The timing and amount of any sales are within the sole discretion of the selling stockholders.

The shares of common stock offered under this prospectus may be sold by the selling stockholders through public or private transactions, on or off the NYSE American, at prevailing market prices or at privately negotiated prices. For more information on the times and manner in which the selling stockholders may sell the shares of common stock under this prospectus, please see the section entitled “*Plan of Distribution*,” beginning on page 19 of this prospectus.

Our common stock is listed on the NYSE American under the symbol “XTNT.” On May 8, 2025, the last reported sale price of our common stock on the NYSE American was \$0.54 per share.

Investing in our shares of common stock involves a high degree of risk. See “*Risk Factors*” beginning on page 3 of this prospectus, as well as those risk factors described in any applicable prospectus supplement and in the documents we incorporate by reference.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is May 19, 2025.

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We are responsible for the information contained and incorporated by reference in this prospectus and any accompanying prospectus supplement we prepare or authorize. Neither we nor the selling stockholders, as defined below, have authorized anyone to provide any information or to make any representations other than those contained in or incorporated by reference into this prospectus and any accompanying prospectus supplement we have prepared. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus and any accompanying prospectus supplement are an offer to sell only the shares offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus and any accompanying prospectus supplement is current only as of the date of the applicable document. Our business, financial condition, results of operations and prospects may have changed since those dates. It is important for you to read and consider all the information contained in this prospectus and in any accompanying prospectus supplement, including the documents incorporated by reference herein or therein, before making your investment decision.

For investors outside the United States: we have not, and the selling stockholders have not, taken any action to permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offer and sale of the common stock and the distribution of this prospectus outside the United States.

ABOUT THIS PROSPECTUS

This prospectus is a part of a shelf registration statement on Form S-1 that we filed with the Securities and Exchange Commission (“SEC”), under the Securities Act of 1933, as amended (“Securities Act”), using a “shelf” registration process. Under this shelf registration process, the selling stockholders named in this prospectus may offer or sell shares of common stock in one or more offerings from time to time. Each time any selling stockholder named in this prospectus (or in any supplement to this prospectus) sells shares of common stock under the registration statement of which this prospectus is a part, such selling stockholder must provide a copy of this prospectus and any applicable prospectus supplement, to a potential purchaser, as required by law.

In certain circumstances, we may provide a prospectus supplement that may add, update or change information contained in this prospectus. Any statement that we make in this prospectus will be modified or superseded by any inconsistent statement made by us in a prospectus supplement. You should read both this prospectus and any prospectus supplement, including all documents incorporated herein or therein by reference, together with additional information described under “*Where You Can Find More Information*” beginning on page 22 of this prospectus and “*Incorporation of Certain Information by Reference*” beginning on page 21 of this prospectus.

Neither we, nor the selling stockholders, have authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. Neither we nor any of the selling stockholders will make an offer to sell our common stock in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus and any prospectus supplement is accurate as of the date on its respective cover, and that any information incorporated by reference is accurate only as of the date of the document incorporated by reference, unless we indicate otherwise. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless otherwise indicated, information contained in this prospectus concerning our industry and the markets in which we operate, including our general expectations and market position, market opportunity and market share, is based on information from our own management estimates and research, as well as from industry and general publications and research, surveys and studies conducted by third parties. Management estimates are derived from publicly available information, our knowledge of our industry and assumptions based on such information and knowledge, which we believe to be reasonable. In addition, assumptions and estimates of our and our industry’s future performance are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, see “*Risk Factors*” beginning on page 3 of this prospectus. These and other factors could cause our future performance to differ materially from our assumptions and estimates. See “*Cautionary Note Regarding Forward-Looking Statements*” beginning on page 9 of this prospectus.

Solely for convenience, trademarks and trade names referred to in this prospectus may appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights, or that the applicable owner will not assert its rights, to these trademarks and tradenames.

Unless the context otherwise indicates, the terms “Xtant,” “XTNT,” “Company,” “we,” “us,” and “our” as used in this prospectus refer to Xtant Medical Holdings, Inc. and our subsidiaries, and the term “common stock” refers to our common stock, par value \$0.000001 per share. The phrase “this prospectus” refers to this prospectus and any applicable prospectus supplement, unless the context otherwise requires.

PROSPECTUS SUMMARY

This summary highlights certain information about us, this offering and selected information contained in this prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our common stock. For a more complete understanding of the Company and this offering, we encourage you to read and consider the more detailed information included or incorporated by reference in this prospectus, including risk factors, see “Risk Factors” beginning on page 3 of this prospectus, and our most recent consolidated financial statements and related notes.

About Xtant Medical Holdings, Inc.

We are a global medical technology company focused on the design, development, and commercialization of a comprehensive portfolio of orthobiologics and spinal implant fixation systems to facilitate spinal fusion in complex spine, deformity, and degenerative procedures. Our products are used by orthopedic spine surgeons and neurosurgeons to treat a variety of spinal disorders in the cervical, thoracolumbar, and interbody spine.

We promote our products in the United States through independent distributors and stocking agents, supported by direct employees. We have an extensive sales channel of independent commissioned agents and stocking distributors in the United States representing some or all of our products. We also maintain a national accounts program to enable our agents to gain access to integrated delivery network (“IDNs”) hospitals and through group purchasing organizations (“GPOs”). We have biologics contracts with major GPOs, as well as extensive access to IDNs across the United States for both biologics and spine hardware systems. While our focus is primarily the United States market, we promote and sell our products internationally through direct sales representatives and stocking distribution partners in Europe, Canada, Mexico, South America, Australia, and certain Pacific region countries.

The address of our principal executive office is 664 Cruiser Lane Belgrade, Montana 59714 and our telephone number is (406) 388-0480.

Recent Private Secondary Sale of our Common Stock

On April 10, 2025, ROS Acquisition Offshore LP, Royalty Opportunities S.à.r.l and OrbiMed Royalty Opportunities II, LP (together, the “Sellers”), each of which are affiliates of OrbiMed Advisors LLC (“OrbiMed Advisors”) and collectively former majority stockholders of the Company, entered into a Stock Purchase Agreement (the “Purchase Agreement”) with the selling stockholders, pursuant to which the Sellers agreed to sell to the selling stockholders an aggregate of 73,114,592 shares of our common stock at a per share price of \$0.42, subject to the terms and conditions contained in the Purchase Agreement. We are not party to the Purchase Agreement, which was privately negotiated amongst the Sellers and the selling stockholders. The closing of the sale of the shares pursuant to the Purchase Agreement (the “Transaction”) occurred on April 15, 2025. To our knowledge, based solely on beneficial ownership filings made with the SEC, the shares sold in the Transaction by the affiliates of OrbiMed Advisors constitute all of the issued and outstanding shares of our common stock previously held by affiliates of OrbiMed Advisors, resulting in OrbiMed Advisors and its affiliates no longer being stockholders of the Company.

To facilitate the Transaction, on April 10, 2025, we entered into a registration rights agreement (the “Registration Rights Agreement”) with the selling stockholders. Pursuant to the Registration Rights Agreement, we agreed to prepare and file a shelf resale registration statement with the SEC within 30 days of the date of the closing of the Transaction, for purposes of registering the resale of the shares. Under the terms of the Registration Rights Agreement, we agreed to use commercially reasonable efforts to cause the resale registration statement to be declared effective by the SEC within 60 days of the date of the closing of the Transaction (90 days in the event the resale registration statement is reviewed by the SEC). We also agreed, among other things, to indemnify the selling stockholders from certain liabilities and to pay all fees and expenses incident to our performance of or compliance with the Registration Rights Agreement. The registration statement of which this prospectus is a part has been filed with the SEC to satisfy this obligation.

The Offering

Common stock to be offered by the selling stockholders:	Up to 73,114,592 shares
Common stock to be outstanding after the offering:	139,323,172 shares (based on 139,323,172 shares outstanding as of May 8, 2025)
Use of proceeds:	We will not receive any proceeds from the sale of shares in this offering. See “ <i>Use of Proceeds</i> ” beginning on page 11 of this prospectus.
Risk factors:	You should read the “ <i>Risk Factors</i> ” beginning on page 3 of this prospectus and the “ <i>Risk Factors</i> ” sections of the documents incorporated by reference in this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
Stock exchange listing:	Our common stock is listed on the NYSE American under the symbol “XTNT.” See “ <i>Market and Dividend Information for our Common Stock</i> ” beginning on page 11 of this prospectus.

RISK FACTORS

Before making an investment decision, you should carefully consider the following risks and the risks described in the “Risk Factors” section of our most recent Annual Report on Form 10-K for the year ended December 31, 2024, filed with the SEC on March 6, 2025, and in any other documents incorporated by reference into this prospectus, as updated by our future filings. The occurrence of any of the events described below could have a material adverse effect on our business, financial condition, results of operations, cash flows, prospects or the value of our common stock. These risks are not the only ones that we face. Additional risks not currently known to us or that we currently deem immaterial also may impair our business.

Risks Related to this Offering and Our Common Stock

The sale or availability for sale of substantial amounts of our common stock, particularly following effectiveness of this resale registration statement, could adversely affect the market price of our common stock.

In a privately negotiated transaction, the Sellers sold to the selling stockholders an aggregate of 73,114,592 shares of our common stock, constituting 52.5% of our common stock outstanding as of April 15, 2025. Pursuant to the Registration Rights Agreement, we are obligated to file a resale registration statement, upon the effectiveness of which these shares will be available for resale. The registration statement of which this prospectus is a part has been filed to satisfy this obligation. Sales of substantial amounts of our common stock in the public market, or the perception that these sales could occur particularly following the effectiveness of the registration statement of which this prospectus is a part, could adversely affect the market price of our common stock and could materially impair our ability to raise capital through equity offerings in the future. We cannot predict what effect, if any, market sales of shares held by the selling stockholders or any other stockholder of our Company or the availability of such shares for future resale will have on the market price of our common stock, although it is likely that such sales would have a material adverse impact on the trading price of our common stock, especially given our low trading volume and low public float. If the trading price of our common stock decreases to levels viewed to be abnormally low and no longer suitable for listing under the NYSE American’s listing standards, the NYSE American likely would commence delisting proceedings and immediately suspend trading in our common stock.

Funds affiliated with Nantahala Capital Management, LLC own a significant percentage of our common stock and are able to exert significant control over matters subject to stockholder approval, preventing other stockholders and new investors from influencing significant corporate decisions.

Funds affiliated with Nantahala Capital Management, LLC (collectively, “Nantahala”) together own approximately 49.1% of our outstanding common stock as of April 15, 2025. Because of its significant share ownership, Nantahala has the ability to exert substantial influence over our management and affairs and over matters requiring action by our stockholders, including amendments to our certificate of incorporation, bylaws, election and removal of directors, and approval of any significant corporate actions, including any merger, consolidation, or sale of all or substantially all of our assets. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock. The interests of Nantahala may not be aligned with the interests of other stockholders. For example, Nantahala may have an interest in pursuing a sale of our Company, acquisitions, divestitures and other transactions or not pursuing such transactions that, in its judgment, could provide Nantahala liquidity or enhance or reduce its investment, even though such transactions might involve risks to us and other stockholders. This concentration of voting control could deprive other stockholders of an opportunity to receive a premium for their shares of our common stock as part of a sale of our Company and ultimately might affect the market price of our common stock. In addition, this significant concentration of stock ownership may adversely affect the trading price of our common stock due to investors’ perception that conflicts of interest may exist or arise.

Shares of our common stock are equity securities and are subordinate to our outstanding indebtedness.

Shares of our common stock are common equity interests. This means that our common stock will rank junior to any outstanding shares of our preferred stock that we may issue in the future or to the indebtedness under our Amended and Restated Credit, Security and Guarantee Agreement (Term Loan), (as amended, the “Term Credit Agreement”), and Amended and Restated Credit, Security and Guaranty Agreement (Revolving Loan) (as amended, the “Revolving Credit Agreement” and, together with the Term Credit Agreement, the “Credit Agreements”), with MidCap Financial Trust and MidCap Funding IV Trust, each in its respective capacity as agent, and any future indebtedness we may incur and to all creditor claims and other non-equity claims against us and our assets available to satisfy claims on us, including claims in a bankruptcy or similar proceeding. Additionally, unlike indebtedness, where principal and interest customarily are payable on specified due dates, in the case of our common stock, (i) dividends are payable only when and if declared by our Board of Directors, and (ii) as a corporation, we are restricted to making dividend payments and redemption payments out of legally available assets. We have never paid a dividend on our common stock and have no current intention to pay dividends in the future. In addition, our Credit Agreements preclude us from paying dividends. Furthermore, our common stock places no restrictions on our business or operations or on our ability to incur indebtedness or engage in any transactions, subject only to the voting rights available to stockholders generally.

Our inability to comply with the continued listing requirements of the NYSE American could result in our common stock being delisted, which could affect its market price and liquidity and reduce our ability to raise capital.

We are required to meet certain qualitative and financial tests to maintain the listing of our common stock on the NYSE American. In order to maintain this listing, we must maintain certain share prices, financial and share distribution targets, including maintaining a minimum amount of stockholders' equity and a minimum number of public stockholders. In addition to these objective standards, NYSE Regulation may delist the securities of any issuer (i) if, in its opinion, the issuer's financial condition and/or operating results appear unsatisfactory; (ii) if it appears that the extent of public distribution or the aggregate market value of the security has become so reduced as to make continued listing on the NYSE American inadvisable; (iii) if the issuer sells or disposes of principal operating assets or ceases to be an operating company; (iv) if an issuer fails to comply with the NYSE American's listing requirements; (v) if an issuer's common stock sells at what NYSE Regulation considers a "low selling price" and the issuer fails to correct this via a reverse split of shares after notification by NYSE Regulation; or (vi) if any other event occurs or any condition exists which makes continued listing on the NYSE American in its opinion, inadvisable. If we do not maintain compliance with the continued listing requirements for the NYSE American within specified periods and subject to permitted extensions, our common stock may be recommended for delisting (subject to any appeal we would file). No assurance can be provided that we will continue to comply with these continued listing requirements.

In September 2024, we received an "early warning" courtesy pointing out to us that our common stock price had decreased below \$1.00 over a 30-trading day average and to remind us as to the NYSE American's listing standards which allow the NYSE American to commence delisting proceedings and immediately suspend trading in the event that our common stock trades at levels viewed to be abnormally low and no longer suitable for listing pursuant to Section 1003(f)(v) of the NYSE American Company Guide. The NYSE American generally views trading below a price of \$0.10 to be abnormally low. If our common stock were delisted, it could be more difficult to buy or sell our common stock and to obtain accurate quotations, and the price of our stock could suffer a material decline. Delisting would also impair our ability to raise capital.

The market price of our common stock is extremely volatile, which may affect our ability to raise capital in the future and may subject the value of the investment of our stockholders to sudden decreases.

The market price for securities of medical device and biotechnology companies, including ours, historically has been highly volatile, and the market from time to time has experienced significant price and volume fluctuations that are unrelated to the operating performance of such companies. The trading volume and prices of our common stock have been and may continue to be volatile and could fluctuate widely due to factors both within and beyond our control. During 2024, the sale price of our common stock ranged from \$0.33 to \$1.31 per share, and our daily trading volume ranged from 1 thousand to 950 thousand shares. Such volatility may be the result of broad market and industry factors. Future fluctuations in the trading price or liquidity of our common stock may harm the value of the investment of our stockholders in our common stock. Factors that may have a significant impact on the market price and marketability of our common stock include, among others:

- our observance of covenants under our Credit Agreements;
- our ability to make interest payments under our Credit Agreements;
- the terms of any potential future transaction(s) related to debt financing, debt restructuring or capital raising;
- announcements of technological innovations or new commercial products by us or our present or potential competitors;
- developments or disputes concerning patent or other proprietary rights;
- developments in our relationships with employees, suppliers, distributors, sales representatives and customers;
- acquisitions or divestitures;

- litigation and government proceedings;
- adverse legislation, including changes in governmental regulation;
- third-party reimbursement policies;
- additions or departures of key personnel;
- sales of our equity securities by our significant stockholders or management or sales of additional equity securities by our Company;
- changes in securities analysts' recommendations;
- short selling;
- changes in health care policies and practices or reimbursement affecting our products or technologies;
- the delisting of our common stock or halting or suspension of trading in our common stock by the NYSE American;
- economic, social and other external factors, such as epidemics or pandemics, supply chain disruptions, labor shortages and persistent inflation; and
- general market conditions.

In the past, following periods of volatility in the market price of a company's securities, securities class action litigation has often been instituted. These lawsuits often seek unspecified damages, and as with any litigation proceeding, one cannot predict with certainty the eventual outcome of pending litigation. Furthermore, we may have to incur substantial expenses in connection with any such lawsuits and our management's attention and resources could be diverted from operating our business as we respond to any such litigation. We maintain insurance to cover these risks for us and our directors and officers, but our insurance is subject to high deductibles to reduce premium expense, and there is no guarantee that the insurance will cover any specific claim that we currently face or may face in the future, or that it will be adequate to cover all potential liabilities and damages.

Our actual operating results may differ significantly from our guidance, which could cause the market price of our common stock to decline.

We issue guidance regarding our future performance, such as our anticipated annual revenue, that represents our management's estimates as of the date of release. This guidance, which consists of forward-looking statements, is prepared by our management and is qualified by, and subject to, the assumptions and the other information contained or referred to in the release. Our guidance is not prepared with a view toward compliance with published guidelines of the American Institute of Certified Public Accountants, and neither any independent registered public accounting firm nor any other independent expert or outside party compiles, examines or reviews the guidance and, accordingly, no such person expresses any opinion or any other form of assurance with respect thereto.

Guidance is based upon a number of assumptions and estimates that, while presented with numerical specificity, is inherently subject to significant business, economic and competitive uncertainties and contingencies, many of which are beyond our control and are based upon specific assumptions with respect to future business decisions, some of which will change. We generally state possible outcomes as high and low ranges which are intended to provide a sensitivity analysis as variables are changed but are not intended to represent that actual results could not fall outside of these ranges. The principal reason that we release this data is to provide a basis for our management to discuss our business outlook with analysts and investors. We do not accept any responsibility for any projections or reports published by any such persons.

Guidance is necessarily speculative in nature, and it can be expected that some or all of the assumptions of the guidance furnished by us will not materialize or will vary significantly from actual results. Accordingly, our guidance is only an estimate of what management believes is realizable as of the date of release. Actual results will vary from the guidance and the variations may be material. Investors should also recognize that the reliability of any forecasted financial data will diminish the farther in the future that the data are forecast. In light of the foregoing, investors are urged to put the guidance in context and not to place undue reliance on it.

Any failure to successfully implement our operating strategy or the occurrence of any of the events or circumstances set forth in our Annual Report on Form 10-K for the year ended December 31, 2024 could result in the actual operating results being different than our guidance, and such differences may be adverse and material. The failure to achieve such guidance or analyst expectations regarding future operating results could disappoint investors and analysts and cause the market price of our common stock to decline.

We may issue additional common stock resulting in stock ownership dilution.

From time to time, we issue equity securities to raise additional financing and in connection with debt restructurings. During 2024, we issued in a private placement approximately 7.8 million shares of common stock at a purchase price of \$0.64 per share. Future dilution may occur due to additional future equity issuances and/or equity financing events by us, including any potential future restructuring of our outstanding indebtedness. In addition, we may raise additional capital through the sale of equity or convertible debt securities, which would further dilute the ownership interests of our stockholders. As of December 31, 2024, we had outstanding warrants to purchase 12,237,470 shares of our common stock. In addition, we had stock options to purchase 1,190,211 shares of our common stock, performance stock units covering 1,710,776 shares of our common stock, restricted stock unit awards covering 2,087,096 shares of our common stock and deferred stock unit awards covering 2,791,096 shares of our common stock under the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan, stock options to purchase 2,735,192 shares of our common stock and restricted stock unit awards covering 397,133 shares of our common stock under the Xtant Medical Holdings, Inc. Second Amended and Restated 2018 Equity Incentive Plan, options to purchase 499 shares of our common stock under our prior equity compensation plan, and 5,618,848 shares available for issuance under the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan. If these or any future warrants, options or restricted stock units are exercised or otherwise converted into shares of our common stock, our stockholders will experience additional dilution.

If securities analysts stop publishing research or reports about us or our business, or if they downgrade our common stock, the trading volume and market price of our common stock could decline.

The market for our common stock relies in part on the research and reports that industry or financial analysts publish about us or our business. We do not control these analysts. If any analyst who covers us downgrades our stock or lowers its future stock price targets or estimates of our operating results, our stock price could decline rapidly. This is particularly true if we fail to meet the expectations of analysts with respect to our revenue and other operating results. Furthermore, if analysts cease to cover our Company, we could lose visibility in the market. Each of these events could, in turn, cause our trading volume and the market price of our common stock to decline.

Anti-takeover provisions in our organizational documents and agreements may discourage or prevent a change in control, even if a sale of our Company could be beneficial to our stockholders, which could cause our stock price to decline and prevent attempts by our stockholders to replace or remove our current management.

Several provisions of our Restated Certificate of Incorporation (“Charter”) and Third Amended and Restated Bylaws (“Bylaws”) could make it difficult for our stockholders to change the composition of our Board of Directors, preventing them from changing the composition of management. In addition, several provisions of our Charter and Bylaws may discourage, delay or prevent a merger or acquisition that our stockholders may consider favorable. These provisions include:

- We have shares of common stock and preferred stock available for issuance without stockholder approval. The existence of unissued and unreserved common stock and preferred stock may enable the Board of Directors to issue shares to persons friendly to current management or to issue preferred stock with terms that could render more difficult or discourage a third-party attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise, thereby protecting the continuity of our management.
- Shares of our common stock do not have cumulative voting rights in the election of directors, so our stockholders holding a majority of the shares of common stock outstanding will be able to elect all of our directors.
- Special meetings of the stockholders may be called only by the Board of Directors, the chair of the Board of Directors or the chief executive officer.

- The Board of Directors may adopt, alter, amend or repeal our Bylaws without stockholder approval.
- Unless otherwise provided by law, any newly created directorship or any vacancy occurring on the Board of Directors for any cause may be filled by the affirmative vote of a majority of the remaining members of the Board of Directors even if such majority is less than a quorum, and any director so elected shall hold office until the expiration of the term of office of the director whom he or she has replaced or until his or her successor is elected and qualified.
- Prior to July 26, 2030, fixing the number of directors at more than seven directors requires the approval of at least 75% of our directors then holding office.
- The affirmative vote of the holders of at least two-thirds of the voting power of the then outstanding shares of our capital stock entitled to vote generally in the election of directors, voting together as a single class, is required to amend or repeal the provisions of our Charter related to the amendment of our Bylaws, the Board of Directors and our stockholders as well as the general provisions of our Charter.
- Stockholders must follow advance notice procedures to submit nominations of candidates for election to the Board of Directors at an annual or special meeting of our stockholders, including director election contests subject to the SEC's universal proxy rules, and must follow advance notice procedures to submit other proposals for business to be brought before an annual meeting of our stockholders.
- Unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware, (or, if the Court of Chancery of the State of Delaware does not have subject matter jurisdiction, a state court located within the State of Delaware or, if no state court located within the State of Delaware has subject matter jurisdiction, the federal district court for the District of Delaware), will be the exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (iii) any action asserting a claim arising under any provision of the General Corporation Law of the State of Delaware ("DGCL"), our Charter or our Bylaws, or (iv) any action asserting a claim governed by the internal-affairs doctrine; provided, however, that unless we consent in writing to an alternative forum, the federal district courts of the United States of America shall be, to the fullest extent permitted by applicable law, the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act.

These anti-takeover provisions could substantially impede the ability of our stockholders to benefit from a change in control and, as a result, could materially adversely affect the market price of our common stock and the ability of our stockholders to realize any potential change-in-control premium.

Our Board of Directors is authorized to issue and designate shares of our preferred stock without stockholder approval.

Our Charter authorizes our Board of Directors, without the approval of our stockholders, to issue up to 10 million shares of our preferred stock, subject to limitations prescribed by applicable law, rules and regulations and the provisions of our Charter, as shares of preferred stock in series, to establish from time to time the number of shares to be included in each such series and to fix the designation, powers, preferences and rights of the shares of each such series and the qualifications, limitations or restrictions thereof. The powers, preferences and rights of these series of preferred stock may be senior to or on parity with our common stock, which may reduce its value.

Our Charter designates the Court of Chancery of the State of Delaware as the exclusive forum for certain litigation that may be initiated by our stockholders, which could limit the ability of our stockholders to obtain a favorable judicial forum for disputes with us.

Our Charter provides that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware, (or, if the Court of Chancery of the State of Delaware does not have subject matter jurisdiction, a state court located within the State of Delaware or, if no state court located within the State of Delaware has subject matter jurisdiction, the federal district court for the District of Delaware), will be the exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (iii) any action asserting a claim arising under any provision of the DGCL, our Charter or our Bylaws, or (iv) any action asserting a claim governed by the internal-affairs doctrine. Furthermore, unless we consent in writing to an alternative forum, the federal district courts of the United States of America shall be, to the fullest extent permitted by applicable law, the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. Any person or entity purchasing or otherwise acquiring any interest in any security of Xtant will be deemed to have notice of and consented to these provisions. This provision may limit the ability of our stockholders to obtain a favorable judicial forum for disputes with us.

We have never paid dividends and do not expect to do so in the foreseeable future.

We have not declared or paid any cash dividends on our common stock. The payment of dividends in the future will be dependent on our earnings and financial condition and on such other factors as our Board of Directors considers appropriate. Unless and until we pay dividends, stockholders may not receive a return on their shares of our common stock. There is no present intention by our Board of Directors to pay dividends on our common stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. In addition, the terms of our Credit Agreements preclude us from paying dividends. As a result, appreciation, if any, in the market price of our common stock will be the sole source of gain for our stockholders for the foreseeable future.

The requirements of being a public company, including compliance with the reporting requirements of the Exchange Act and the requirements of the Sarbanes-Oxley Act and the NYSE American, may strain our resources and divert management's attention, and we may be unable to comply with these requirements in a timely or cost-effective manner.

As a public company, we are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the corporate governance standards of the Sarbanes-Oxley Act and the NYSE American. These requirements place a strain on our management, systems and resources and we will continue to incur significant legal, accounting, insurance and other expenses. The Exchange Act requires us to file annual, quarterly and current reports with respect to our business and financial condition within specified time periods and to prepare a proxy statement with respect to our annual meeting of stockholders. The Sarbanes-Oxley Act requires that we maintain effective disclosure controls and procedures and internal controls over financial reporting. The NYSE American requires that we comply with various continued listing requirements and corporate governance requirements. To maintain and improve the effectiveness of our disclosure controls and procedures and internal controls over financial reporting and comply with the Exchange Act and NYSE American requirements, significant resources and management oversight are required. This may divert management's attention from other business concerns and lead to significant costs associated with compliance, which could have a material adverse effect on us and the market price of our common stock. Furthermore, as we grow our business both organically and through acquisitions, our disclosure controls and procedures and internal control over financial reporting will become more complex, and we may require significantly more resources to ensure that these controls and procedures remain effective.

These laws and regulations could also make it more difficult or costly for us to obtain certain types of insurance, including director and officer liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. These laws and regulations could also make it more difficult for us to attract and retain qualified persons to serve on our Board of Directors or its committees or as our executive officers. Advocacy efforts by stockholders and third parties may also prompt even more changes in governance and reporting requirements. We cannot predict or estimate the amount of additional costs we may incur or the timing of these costs. Furthermore, if we are unable to satisfy our obligations as a public company, we could be subject to delisting of our common stock, fines, sanctions and other regulatory action and potentially civil litigation.

We may be subject to securities litigation, which is expensive and could divert management attention.

Our stock price has been volatile and, in the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may be the target of this type of litigation in the future. Litigation of this type could result in substantial costs and diversion of management's attention and resources, which could have a material adverse effect on our business, operating results, financial condition, or prospects. Any adverse determination in litigation could also subject us to significant liabilities.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements contained in or incorporated by reference into this prospectus, or filings with the SEC and our public releases, that are not purely historical are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Our forward-looking statements include, but are not limited to, statements regarding our expectations, hopes, beliefs, intentions or strategies regarding the future. In addition, any statements that refer to projections, forecasts, or other characterizations of future events or circumstances, including any underlying assumptions, are forward-looking statements. The words “anticipate,” “believe,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “might,” “plan,” “possible,” “potential,” “predict,” “project,” “should” and “would,” as well as similar expressions, may identify forward-looking statements, but the absence of these words does not mean that a statement is not forward looking. Forward-looking statements contained in or incorporated by reference into this prospectus may include, for example, statements about the following topics and are subject to certain risks and uncertainties, including the following:

- the potential impacts of Nantahala’s ownership of a significant percentage of our common stock on our Company and other stockholders;
- the potential impact of future sales of the selling stockholders’ shares, or the perception that such sales may occur, on the market price of our common stock;
- whether we will be able to comply with applicable NYSE American listing standards following any decreases in the market price of our common stock that may result from future sales of the selling stockholders’ shares;
- our ability to increase revenue and improve our gross margins, our operating expenses as a percentage of revenue, and obtain and sustain profitability;
- our ability to maintain sufficient liquidity to continue to meet the financial covenants under our Credit Agreements and to continue to fund our operations and our ability to obtain financing on reasonable terms when needed and the effect of such additional financing on our business, results of operations, financial condition and stockholders;
- our ability to service our debt and comply with the covenants in our Credit Agreements and the effect of our significant indebtedness on our business, results of operations, financial condition and prospects;
- our ability to execute our strategic priorities and become operationally self-sustaining by controlling our supply chain, especially with respect to stem cells, and becoming less reliant on production and manufacturing of our products outside of our control, which we believe will allow us to be a larger and more diverse producer of biologics;
- our ability and success in implementing key growth and process improvement initiatives designed to increase our production capacity, revenue and scale and risks associated with such growth and process improvement initiatives;
- the effect of a global economic slowdown, the prospects for recession, tariffs, inflation, rising interest rates, and supply chain disruptions on our business, operating results and financial position, which, among other effects, could result in delayed product launches, lost revenue, higher costs, decreased profit margins and other adverse effects on our business and operating results;
- our dependence on and ability to retain and recruit independent sales agents and distributors with appropriate expertise and motivate and incentivize them to engage with customers and sell our products, including in particular our dependence on key independent agents for a significant portion of our revenue;
- the ability of our sales personnel, including our independent sales agents and distributors, to achieve expected results;
- our ability to leverage sales under our recent license agreements and manufacture, develop, introduce, market and license new products and technologies and the success of such new products and technologies, including our recently launched next-generation demineralized bone matrix, Trivium™;
- our ability to innovate, develop, introduce, market and license new products and technologies and the success of such new products and technologies, including our recently launched next-generation demineralized bone matrix, Trivium™;
- the effect of our private label and original equipment manufacturer (“OEM”) business on our business and operating results and risks associated therewith, including fluctuations in our operating results and decreased profit margins, and the possibility that we may become more in the OEM business;
- our ability to implement successfully our four key growth initiatives, which are focused on introducing new products, expanding our distribution network, penetrating adjacent markets and leveraging our growth platform with technology and strategic acquisitions;
- risks associated with our international operations, including but not limited to the effect of foreign currency exchange rate fluctuations and compliance with foreign legal and regulatory requirements, current and future wars, related sanctions and geopolitical tensions, political risks associated with the potential instability of governments and legal systems in countries in which we or our customers or suppliers conduct business, and other potential conflicts;

- our ability to operate in international markets and effectively manage our international subsidiaries, which require management attention and financial resources;
- our ability to navigate manufacturing challenges related to the production of biologics products and recover from our prior stem cell shortage and our ability to win back stem cell customers and achieve future stem cell revenue as anticipated;
- our ability to retain and expand our agreements with GPOs and IDNs and sell products to members of such GPOs and IDNs;
- the effect of labor and staffing shortages at hospitals and other medical facilities on the number of elective procedures in which our products are used and as a result our revenues, as well as global and local labor shortages and loss of personnel, which have adversely affected and may continue to adversely affect our ability to produce product to meet demand;
- our ability to remain competitive;
- our ability to integrate acquired products with our existing product line and successfully transition our customers from some of our older legacy hardware products to these new products and the anticipated adverse effect of these transitions on our organic revenue growth rate;
- our reliance on third party suppliers and manufacturers;
- the effect of product liability claims and other litigation to which we may be subjected and product recalls and defects;
- the effect of infectious diseases on our business, operating results and financial condition;
- the effect of fluctuations in foreign currency exchange rates on our earnings and our foreign currency translation adjustments;
- risks associated with and the effect of a shift in procedures using our products from hospitals to ambulatory surgical centers, which would put pressure on the price of our products and margins;
- our ability to obtain and maintain regulatory approvals in the United States and abroad and the effect of government regulations and our compliance with government regulations;
- the ability of our clinical trials to demonstrate competent and reliable evidence of the safety and effectiveness of our products;
- our ability to remain accredited with the American Association of Tissue Banks and continue to obtain a sufficient number of donor cadavers for our products;
- our ability to obtain and maintain government and third-party coverage and reimbursement for our products;
- our ability to attract, retain and engage qualified technical, sales and processing personnel and members of our management team, especially in light of a tight labor market and increasing cost of living in and around the Belgrade, Montana area;
- our expectations regarding operating trends, future financial performance and expense management and our estimates of our future revenue, expenses, ongoing losses, gross margins, operating leverage, capital requirements and our need for, or ability to obtain, additional financing and the availability of our credit facilities;
- our ability to generate revenue from our recent license agreements, license certain of our intellectual property on commercially reasonable terms and maintain our intellectual property licenses; and
- our ability to obtain and protect our intellectual property and proprietary rights and operate without infringing the intellectual property rights of others.

The forward-looking statements contained in this prospectus or in any documents incorporated by reference are based on our current expectations and beliefs concerning future developments and their potential effects on us. There can be no assurance that future developments affecting us will be those that we have anticipated. These forward-looking statements involve a number of risks, uncertainties, or assumptions, many of which are beyond our control, which may cause actual results or performance to be materially different from those expressed or implied by these forward-looking statements. These risks and uncertainties include, but are not limited to, those factors described in this prospectus, see “*Risk Factors*” beginning on page 3 of this prospectus, our Annual Report on Form 10-K for the year ended December 31, 2024, filed with the SEC on March 6, 2025, our Current Report on Form 8-K filed with the SEC on April 16, 2025, and subsequent filings with the SEC.

Should one or more of these risks or uncertainties materialize, or should any of our assumptions prove incorrect, actual results may vary in material respects from those projected in these forward-looking statements. All forward-looking statements speak only as of the date of this prospectus. We undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required under applicable securities laws.

USE OF PROCEEDS

We are filing the registration statement of which this prospectus is a part to permit holders of our common stock described in the section entitled “*Selling Stockholders*,” beginning on page 16 of this prospectus, to resell such shares. We are not selling any securities under this prospectus and will not receive any proceeds from the sale of shares by the selling stockholders.

We will bear all expenses incurred in connection with the performance of our obligations under the Registration Rights Agreement.

DILUTION

This offering is for sales of our common stock, if any, by the selling stockholders on a continuous or delayed basis in the future. Sales of our common stock by selling stockholders will not result in a change to the net tangible book value per share before and after the distribution of shares by such selling stockholders.

There will be no change in net tangible book value per share attributable to cash payments made by purchasers of the shares of common stock being offered. Prospective investors should be aware, however, that the price of shares of our common stock may not bear any rational relationship to net tangible book value per share of our common stock.

MARKET AND DIVIDEND INFORMATION FOR OUR COMMON STOCK

Market Information

Our common stock is listed on the NYSE American under the ticker symbol “XTNT.” The closing sale price to our common stock on May 8, 2025 was \$0.54 per share.

Holders of Record

As of May 8, 2025, we had 177 holders of record. A greater number of owners of our common stock are beneficial holders, whose shares of record are held by banks, brokers, and other financial institutions.

Dividends

We have not paid any cash dividends and do not expect to do so in the foreseeable future. In addition, our Credit Agreements preclude us from paying dividends.

DESCRIPTION OF SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement, summarizes the material terms and provisions of our common stock and does not purport to be complete. It is subject to and qualified in its entirety by reference to the provisions of our Charter and Bylaws, which are filed as exhibits to the registration statement that includes this prospectus and are incorporated by reference herein. We encourage you to read our Charter, Bylaws, and the applicable provisions of the DGCL for additional information.

Authorized and Outstanding Capital Stock

Our Charter provides that we have authority to issue 300,000,000 shares of common stock, 139,323,172 of which are issued and outstanding as of May 8, 2025, and 10,000,000 shares of preferred stock, none of which are issued and outstanding as of the date of this prospectus. As of May 8, 2025, in the aggregate, we had outstanding warrants to purchase 12,237,470 shares of our common stock. In addition, we had stock options to purchase 1,190,211 shares of our common stock, performance stock units covering 1,710,776 shares of our common stock, restricted stock unit awards covering 2,087,096 shares of our common stock and deferred stock unit awards covering 2,791,096 shares of our common stock under the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan, stock options to purchase 2,735,192 shares of our common stock and restricted stock unit awards covering 397,133 shares of our common stock under the Xtant Medical Holdings, Inc. Second Amended and Restated 2018 Equity Incentive Plan, options to purchase 499 shares of our common stock under our prior equity compensation plan, and 5,618,848 shares available for issuance under the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan.

Our preferred stock may be issued from time to time in one or more series. The Board of Directors is authorized, by resolution or resolutions, to fix the number of shares of any series of preferred stock and to determine the designation, powers, rights, preferences, qualifications, limitations, privileges and restrictions, if any, of any wholly unissued series of preferred stock, including without limitation, authority to fix by resolution or resolutions the dividend rights, dividend rate, conversion rights, voting rights, rights and terms of redemption (including sinking fund provisions), redemption price or prices and liquidation preferences of any such series, and the number of shares constituting any such series and the designation thereof, or any of the foregoing.

We may amend from time to time our Charter to increase the number of authorized shares of common stock or preferred stock. Any such amendment would require the approval of the holders of a majority of the voting power of the shares entitled to vote thereon. In addition, pursuant to our Charter, the Board of Directors is authorized to increase (but not above the total number of authorized shares of the class) or decrease (but not below the number of shares of any such series then outstanding) the number of shares of any series (including a series of preferred stock), the number of which was fixed by it, subsequent to the issuance of shares of such series then outstanding, subject to certain limitations, without the vote of our stockholders.

Common Stock

Voting Rights

Each holder of our common stock is entitled to one vote per share on each matter submitted to a vote at a meeting of stockholders, including in all elections for directors. Stockholders are not entitled to cumulative voting in the election of directors. Subject to applicable law and the rights, if any, of the holders of outstanding shares of any series of preferred stock we may designate and issue in the future, holders of our common stock are entitled to vote on all matters on which stockholders are generally entitled to vote.

Our stockholders may vote either in person or by proxy. At all meetings of stockholders for the election of directors at which a quorum is present, a plurality of the votes cast shall be sufficient to elect. All other elections and questions presented to the stockholders at a meeting at which a quorum is present shall, unless otherwise provided by our Charter, our Bylaws, the rules or regulations of any stock exchange applicable to us or applicable law or pursuant to any regulation applicable to us or our securities, be decided by the affirmative vote of the holders of a majority in voting power of the shares of our stock that are present in person or by proxy and entitled to vote thereon.

Dividends

The Board of Directors may authorize, and we may make, distributions to our stockholders, subject to any restriction in our Charter and to those limitations prescribed by law and contractual restrictions. Subject to preferences that may apply to any shares of preferred stock outstanding at the time, the holders of our common stock will be entitled to share equally, identically and ratably in any dividends that the Board of Directors may determine to issue from time to time.

Liquidation Rights

Upon liquidation, dissolution or winding up, all holders of our common stock are entitled to participate pro rata in our assets available for distribution, subject to applicable law and the rights, if any, of the holders of any class of preferred stock then outstanding.

Other Rights and Preferences

Under the terms of our Charter and Bylaws, holders of our common stock have no preemptive rights, conversion rights or subscription rights, and there are no redemption or sinking fund provisions applicable to our common stock. The rights, preferences and privileges of the holders of our common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that the Board of Directors may designate and issue in the future. Our Charter and Bylaws do not restrict the ability of a holder of our common stock to transfer his, her or its shares of common stock. All shares of our common stock currently outstanding are fully paid and non-assessable.

Transfer Agent

The transfer agent for our common stock is Broadridge Corporate Issuer Solutions, Inc.

Exchange Listing

Our common stock is listed on NYSE American under the symbol "XTNT."

Anti-Takeover Effects of Certain Provisions of our Charter and Bylaws and under the DGCL

Anti-takeover provisions in our Charter and Bylaws and under the DGCL may discourage or prevent a change in control, even if such a sale could be beneficial to our stockholders.

Charter and Bylaws

Our Charter and Bylaws contain the following anti-takeover provisions that may have an anti-takeover effect of delaying, deferring or preventing a change in control of our Company:

- We have shares of common stock and preferred stock available for issuance without stockholder approval. The existence of unissued and unreserved common stock and preferred stock may enable the Board of Directors to issue shares to persons friendly to current management or to issue preferred stock with terms that could render more difficult or discourage a third-party attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise, thereby protecting the continuity of our management.
- Shares of our common stock do not have cumulative voting rights in the election of directors, so our stockholders holding a majority of the shares of common stock outstanding will be able to elect all of our directors.
- Special meetings of the stockholders may be called only by the Board of Directors, the Chair of the Board of Directors or the Chief Executive Officer.
- The Board of Directors may adopt, alter, amend or repeal our Bylaws without stockholder approval.
- Unless otherwise provided by law, any newly created directorship or any vacancy occurring on the Board of Directors for any cause may be filled by the affirmative vote of a majority of the remaining members of the Board of Directors, even if such majority is less than a quorum, and any director so elected shall hold office until the expiration of the term of office of the director whom he or she has replaced or until his or her successor is elected and qualified.

- Prior to July 26, 2030, fixing the number of directors at more than seven directors requires the approval of at least 75% of our directors then holding office.
- The affirmative vote of the holders of at least two-thirds of the voting power of the then outstanding shares of our capital stock entitled to vote generally in the election of directors, voting together as a single class, is required to amend or repeal the provisions of our Charter related to the amendment of our Bylaws, the Board of Directors and our stockholders as well as the general provisions of our Charter.
- Stockholders must follow advance notice procedures to submit nominations of candidates for election to the Board of Directors at an annual or special meeting of our stockholders, including director election contests subject to the SEC's universal proxy rules, and must follow advance notice procedures to submit other proposals for business to be brought before an annual meeting of our stockholders.
- Unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware, (or, if the Court of Chancery of the State of Delaware does not have subject matter jurisdiction, a state court located within the State of Delaware or, if no state court located within the State of Delaware has subject matter jurisdiction, the federal district court for the District of Delaware), will be the exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee to us or our stockholders, (iii) any action asserting a claim arising under any provision of the DGCL, our Charter or our Bylaws, or (iv) any action asserting a claim governed by the internal-affairs doctrine; provided, however, that unless we consent in writing to an alternative forum, the federal district courts of the United States of America shall be, to the fullest extent permitted by applicable law, the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act.

Section 203 of the DGCL

We have elected to be subject to Section 203 of the DGCL ("Section 203"), and we are prohibited from engaging in any business combination with any interested stockholder for a period of three years after the date that such stockholder became an interested stockholder, with the following exceptions:

- before such date, the Board of Directors approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting shares outstanding at the time the transaction began, excluding for purposes of determining the voting shares outstanding (but not the outstanding voting shares owned by the interested stockholder) those shares owned (i) by persons who are directors and also officers and (ii) employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or after such date, the business combination is approved by the Board of Directors and authorized at an annual or special meeting of the stockholders, and not by written consent, by the affirmative vote of at least 66-2/3% of the outstanding voting shares that are not owned by the interested stockholder.

In general, Section 203 defines business combination to include the following:

- any merger or consolidation involving the company and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the company involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the company of any shares of the company to the interested stockholder;
- any transaction involving the company that has the effect of increasing the proportionate share of the shares or any class or series of shares of the company beneficially owned by the interested stockholder; or

- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits by or through the company.

In general, by reference to Section 203, an “interested stockholder” is an entity or person who, together with the person’s affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status owned, 15% or more of the outstanding voting shares of the company.

Limitations of Liability and Indemnification Matters

We have adopted provisions in our Charter that limit or eliminate the liability of our directors and officers for monetary damages for breach of their fiduciary duties, except for a breach of the duty of loyalty to our Company or its stockholders, for acts or omissions not in good faith or involving intentional misconduct or a knowing violation of law, or for any transaction from which a director or officer, as the case may be, derived an improper personal benefit. Accordingly, our directors and officers will not be personally liable for monetary damages for breach of their fiduciary duties as directors or officers, respectively, except with respect to the following:

- any breach of their duty of loyalty to us or our stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- in the case of directors, unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the DGCL;
- any transaction from which the director or officer derived an improper personal benefit; or
- in the case of officers, any action by or in the right of the Company.

This limitation of liability does not apply to liabilities arising under the federal securities laws and does not affect the availability of equitable remedies such as injunctive relief or rescission. If Delaware law is amended to authorize the further elimination or limiting of director or officer liability, then the liability of our directors and/or officers will be eliminated or limited to the fullest extent permitted by Delaware law as so amended.

Our Bylaws provide for mandatory indemnification of directors and officers to the maximum extent allowed by applicable law. We believe that indemnification under our Bylaws covers at least negligence and gross negligence on the part of indemnified parties. In addition, we have also entered into indemnification agreements with our directors and officers, pursuant to which we must:

- indemnify officers and directors against certain liabilities that may arise because of their status as officers and directors;
- advance expenses, as incurred, to officers and directors in connection with a legal proceeding subject to limited exceptions; and
- cover officers and directors under any general or directors’ and officers’ liability insurance policy maintained by us.

We also maintain directors’ and officers’ liability insurance.

We believe that these provisions and agreements are necessary to attract and retain qualified persons as directors and executive officers. Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling us pursuant to the foregoing provisions, the opinion of the SEC is that such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

SELLING STOCKHOLDERS

The selling stockholders may offer and sell, from time to time, any or all of the shares of common stock being offered for resale by this prospectus, which consists of up to 73,114,592 shares of common stock. As used in this prospectus, the term “selling stockholders” includes the selling stockholders listed in the table below, together with any additional selling stockholders listed in a subsequent amendment to this prospectus, and their donees, pledgees, assignees, transferees, distributees or other successors-in-interest that receive shares in any non-sale transfer after the date of this prospectus. All of the selling stockholder acquired the shares of common stock being offered for resale by this prospectus under the Purchase Agreement, and we agreed to register the resale of such shares under the Registration Rights Agreement.

The table below lists the selling stockholders and other information regarding the beneficial ownership of the shares of common stock by each of the selling stockholders as of May 8, 2025. The following table also provides the number of shares of common stock that may be sold by each selling stockholder under this prospectus and that each selling stockholder will beneficially own assuming all the shares of common stock that may be offered pursuant to this prospectus are sold. Because each selling stockholder may dispose of all, none or some portion of their shares of common stock, no estimate can be given as to the number of shares of common stock that will be beneficially owned by a selling stockholder upon termination of this offering. For purposes of the table below, however, we have assumed that after termination of this offering none of the shares of common stock covered by this prospectus will be beneficially owned by the selling stockholders and further assumed that the selling stockholders will not acquire beneficial ownership of any additional securities during the offering. In addition, the selling stockholders may have sold, transferred or otherwise disposed of, or may sell, transfer or otherwise dispose of, at any time and from time to time, our securities in transactions exempt from the registration requirements of the Securities Act after the date on which the information in the table is presented. See the section titled “*Plan of Distribution.*” We will not receive any of the proceeds from the sale of the shares of common stock offered under this prospectus.

The amounts and information set forth below are based upon information provided to us by the selling stockholders or their representatives, or on our records, as of May 8, 2025. The percentage of beneficial ownership for the following table is based on 139,323,172 shares of common stock outstanding as of May 8, 2025. To our knowledge, except as indicated in the footnotes to this table, each stockholder named in the table has sole voting and investment power with respect to all shares of common stock shown in the table to be beneficially owned by such stockholder. Except as described below, none of the selling stockholders has had any position, office or other material relationship with us or any of our predecessors or affiliates within the past three years. In addition, based on information provided to us, none of the selling stockholders that are affiliates of broker-dealers, if any, purchased the shares of common stock outside the ordinary course of business or, at the time of their acquisition of such shares, had any agreements, understandings or arrangements with any other persons, directly or indirectly, to dispose of the shares. Information concerning the selling stockholders may change from time to time, and any changed information will be set forth in supplements to this prospectus to the extent required.

Name of Selling Stockholder	Shares Beneficially Owned Prior to the Offering		Number of Shares Being Offered	Shares Beneficially Owned After Completion of the Offering	
	Number	Percentage		Number	Percentage
Blackwell Partners LLC - Series A ⁽¹⁾	29,300,484	21.0%	24,013,069	5,287,415	3.8%
Nantahala Capital Partners Limited Partnership ⁽¹⁾	16,380,396	11.8%	14,516,557	1,863,839	1.3%
Pinehurst Partners, L.P. ⁽¹⁾	14,404,762	10.3%	11,904,762	2,500,000	1.8%
NCP RFM LP ⁽¹⁾	8,073,983	5.8%	6,565,612	1,508,371	1.1%
Lytton-Kambara Foundation ⁽²⁾	7,728,505	5.5%	4,761,905	2,966,600	2.1%
John Lipman ⁽³⁾	4,933,083	3.5%	2,857,143	2,075,940	1.5%
Carol Ann Vizirgianakis	2,916,971	2.1%	2,916,971	—	—
Norman Pessin SEP IRA ⁽⁴⁾	2,811,610	2.0%	1,190,476	1,621,134	1.2%
Claudio Da Re ⁽⁵⁾	2,759,567	2.0%	1,190,477	1,569,090	1.1%
Lonny Agulnick ⁽⁶⁾	1,999,100	1.4%	476,191	1,522,909	1.1%
Brian and Diana Pessin, JTWROS ⁽⁷⁾	914,663	*	476,191	438,472	*
Horton Capital Partners Fund, LP ⁽⁸⁾	850,000	*	850,000	—	—
Hildene Holdings LLC ⁽⁹⁾	800,000	*	800,000	—	—
Sylvia Potter Family LP ⁽¹⁰⁾⁽¹¹⁾	308,244	*	238,095	70,149	*
Michael Potter ⁽¹¹⁾	281,429	*	238,095	43,334	*
Northern Valley Partners ⁽¹¹⁾⁽¹²⁾	205,856	*	119,048	86,808	*
Total	94,668,653		73,114,592		

(1) Based on information contained in a Schedule 13D filed with the SEC on April 17, 2025. Nantahala Capital Management, LLC is a Registered Investment Adviser and has been delegated the legal power to vote and/or direct the disposition of such securities on behalf of the selling stockholder as a General Partner, Investment Manager, or Sub-Advisor and would be considered the beneficial owner of such securities. The above shall not be deemed to be an admission by the record owners or the selling stockholder that they are themselves beneficial owners of these securities for purposes of Section 13(d) of the Exchange Act or any other purpose. Wilmot Harkey and Daniel Mack are managing members of Nantahala Capital Management, LLC and may be deemed to have voting and dispositive power over the shares held by the selling stockholder.

- (2) Based on information contained in a Schedule 13G filed with the SEC on April 16, 2025. Represents 7,728,505 shares of our common stock held by Lytton-Kambara Foundation. Laurence Lytton has voting and investment control over the shares of our common stock held by the Lytton-Kambara Foundation. Excludes 1,725,072 shares held directly by Mr. Lytton and 31,194 shares held by Alice W Lytton Family LLC and 4,660 shares held by Isabel Lytton over which Mr. Lytton has beneficial ownership.
- (3) These shares of common stock are held directly by Mr. Lipman. Mr. Lipman is an affiliate of a broker-dealer, Lucid Capital Markets, LLC, and has represented to us that (1) he purchased the shares in the ordinary course of business and (2) at the time of purchase, he had no agreements or understandings, directly or indirectly, with any person to distribute the shares. The number of shares includes 126,909 shares of common stock issuable upon exercise of warrants.
- (4) Norman H. Pessin has voting and investment control over the shares of common stock held by SEP FBO Norman H Pessin Pershing LLC as Custodian. Separately, Mr. Pessin beneficially owns 1,451,922 shares together with his spouse. The number of shares also includes 169,212 shares of common stock issuable upon exercise of warrants held by Mr. Pessin's spouse.
- (5) The number of shares includes 253,818 shares of common stock issuable upon exercise of warrants.
- (6) The number of shares includes 507,636 shares of common stock issuable upon exercise of warrants.
- (7) The number of shares beneficially owned includes 333,866 shares of common stock held by the Pessin Children's Trust, dated September 8, 2010, of which Brian Pessin serves as Trustee, and 20,000 shares held by children of Brian and Diana Pessin. The number of shares also includes 84,606 shares of common stock issuable upon exercise of warrants held by the Pessin Children's Trust, dated September 8, 2010.
- (8) Joseph Manko, Jr. has voting and investment control over the shares of common stock held by Horton Capital Partners Fund, LP.
- (9) Dan Shribman has voting and investment control over the shares of common stock held by Hildene Holdings LLC.
- (10) Michael Potter has voting and investment control over the shares of common stock held by Sylvia Potter Family LP.
- (11) The shares of common stock are beneficially owned by Michael Potter, who serves as General Partner of Sylvia Potter Family LP and Northern Valley Partners.
- (12) Michael Potter has voting and investment control over the shares of common stock held by Northern Valley Partners.

Material Relationships Between Selling Stockholders and Xtant

Related Parties

Carol Ann Vizirgianakis, one of the selling stockholders, is the mother of Stavros Vizirgianakis, a director of the Company and Chair of the Company's Board of Directors.

Registration Rights Agreement

On April 10, 2025, we entered into the Registration Rights Agreement with the selling stockholders. Pursuant to the Registration Rights Agreement, we agreed to prepare and file a shelf resale registration statement with the SEC within 30 days of the date of the closing, for purposes of registering the resale of the selling stockholders' shares. Under the terms of the Registration Rights Agreement, we agreed to use commercially reasonable efforts to cause the resale registration statement to be declared effective by the SEC within 60 days of the date of the closing (90 days in the event the resale registration statement is reviewed by the SEC). We also agreed, among other things, to indemnify the selling stockholders from certain liabilities and to pay all fees and expenses incident to the Company's performance of or compliance with the Registration Rights Agreement. The registration statement of which this prospectus is a part has been filed to satisfy this obligation.

2024 Private Placement

On August 7, 2024, we entered into a Securities Purchase Agreement with several investors, pursuant to which we sold an aggregate of 7,812,500 shares of common stock at a purchase price of \$0.64 per share for aggregate proceeds of approximately \$5.0 million. The closing of the 2024 private placement occurred on August 9, 2024, at which time we entered into a registration rights agreement with the investors. The following selling stockholders participated in the 2024 private placement: Blackwell Partners LLC – Series A, Corbin Sustainability & Engagement Fund, L.P. (a fund affiliated with Nantahala), Nantahala Capital Partners Limited Partnership, NCP RFM LP, and Pinehurst Partners, L.P.

2023 Private Placement

On July 3, 2023, we entered into a securities purchase agreement with several investors, pursuant to which we agreed to issue an aggregate of 20,000,000 shares of our common stock at a per share purchase price of \$0.75 for aggregate gross proceeds of \$15.0 million. The closing of the 2023 private placement occurred on July 6, 2023, at which time we entered into a registration rights agreement with the investors. The following selling stockholders participated in the 2023 private placement: The Lytton-Kambara Foundation, Blackwell Partners LLC - Series A, John Lipman, Claudio Da Re, NCP RFM LP, SEP FBO Norman H Pessin Pershing LLC as Custodian, Nantahala Capital Partners Limited Partnership, and Nantahala Capital Partners II Limited Partnership (a fund affiliated with Nantahala).

2022 Private Placement

On August 23, 2022, we entered into a securities purchase agreement with several investors, pursuant to which we agreed to issue an aggregate of 20,305,429 shares of our common stock and warrants to purchase an aggregate of 5,076,358 shares of common stock at a per unit (each unit consisting of one share of common stock and a warrant to purchase 0.25 of a share of common stock) purchase price of \$0.48, which represents a 2.5% discount to the 10-day volume-weighted average price of the common stock ending August 19, 2022. Additionally, we agreed that in the event we, or any of our subsidiaries, propose to offer and sell shares of common stock or certain common stock equivalents primarily for capital raising purposes, we would provide the 2022 private placement investors the right, but not the obligation, to participate in such offering in an aggregate amount of up to 20% of the securities offered in such offering, subject to certain customary exceptions. This participation right expired on October 7, 2023. As a result of the 2022 private placement, we received gross proceeds of approximately \$9.75 million before deducting estimated offering expenses payable by the Company. The first closing of the 2022 private placement occurred on August 25, 2022, and the second closing of the private placement occurred on October 7, 2022, at which time we entered into a registration rights agreement with the investors. The following selling stockholders participated in the 2022 private placement: Lonny Agulnick, Claudio Da Re, Sandra Pessin (spouse of Norman Pessin), John Lipman, and the Pessin Children's Trust, dated September 8, 2010 (for which Brian Pessin serves as Trustee).

PLAN OF DISTRIBUTION

Each selling stockholder and any of their donees, pledgees, assignees, transferees, distributees or other successors-in-interest may, from time to time, sell any or all of their shares of common stock covered hereby on the NYSE American or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. A selling stockholder may use any one or more of the following methods when selling such shares of common stock:

- ordinary brokerage transactions and transactions in which the broker dealer solicits purchasers;
- block trades in which the broker dealer will attempt to sell the shares of common stock as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker dealer as principal and resale by the broker dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- directly to one or more purchasers;
- settlement of short sales;
- in transactions through broker dealers that agree with the selling stockholders to sell a specified number of such shares of common stock at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell the shares of common stock under Rule 144 or any other exemption from registration under the Securities Act, if available, rather than under this prospectus.

Broker dealers engaged by the selling stockholders may arrange for other brokers dealers to participate in sales. Broker dealers may receive commissions or discounts from the selling stockholders (or, if any broker dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.

In connection with the sale of the shares of common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The selling stockholders may also sell the shares of common stock short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell the shares of the common stock. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of the shares of common stock offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the shares of common stock may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each selling stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the shares of common stock.

We are required to pay certain fees and expenses incurred by us incident to the registration of the shares of common stock. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We have agreed to keep the registration statement of which this prospectus forms a part effective until the earlier of (i) the date on which the shares of common stock may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for us to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect, and (ii) all of the shares of common stock have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The shares of common stock will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the shares of common stock covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the shares of common stock may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

The validity of the shares of our common stock being offered by this prospectus has been passed upon for us by Fox Rothschild LLP, Minneapolis, Minnesota.

EXPERTS

The audited financial statements of Xtant Medical Holdings, Inc. as of and for the years ended December 31, 2024 and 2023 incorporated by reference into this prospectus and in the registration statement have been so incorporated by reference in reliance upon the report of Grant Thornton LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus.

We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below (File No. 001-34951) that we have filed with the SEC:

- our Annual Report on Form 10-K for the year ended December 31, 2024, filed on [March 6, 2025](#);
- our Quarterly Report on Form 10-Q for the quarter ended March 31, 2025, filed on [May 12, 2025](#);
- our Current Reports on Form 8-K (other than portions thereof furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits accompanying such reports that are related to such items) filed on [August 18, 2023](#), [April 11, 2025](#) and [April 16, 2025](#);
- all documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement; and
- all documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act on or after the date of this prospectus and before we stop offering the securities under this prospectus.

We are not, however, incorporating by reference any documents, or portions of documents, which are not deemed “filed” with the SEC.

You can obtain a copy of any or all of the documents incorporated by reference in this prospectus (other than an exhibit to a document unless that exhibit is specifically incorporated by reference into that document) from the SEC on its website at www.sec.gov. You may also obtain these documents from us, free of charge, by visiting our internet website www.xtantmedical.com or by writing to us or calling us at the following address and phone number:

Xtant Medical Holdings, Inc.
600 Cruiser Lane
Belgrade, Montana 59714
Attn: Corporate Secretary
(406) 388-0480

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act that registers the distribution of the common stock offered under this prospectus. The registration statement, including the attached exhibits and schedules and the information incorporated by reference, contains additional relevant information about us and the common stock. The rules and regulations of the SEC allow us to omit from this prospectus certain information included in the registration statement. In addition, we file annual, quarterly and current reports, proxy statements and other information with the SEC.

You may also obtain the documents that we file electronically on the SEC's website at www.sec.gov, which contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, or on our website at www.xtantmedical.com. Information contained on our website is not incorporated by reference herein and does not constitute part of this prospectus.

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITY

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling the registrant pursuant to the foregoing provisions, the registrant has been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

XTANT MEDICAL HOLDINGS, INC.

PROSPECTUS

73,114,592 Shares of Common Stock

May 19, 2025
