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

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**FORM S-1**  
REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

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**XTANT MEDICAL HOLDINGS, INC.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction of  
incorporation or organization)

**3841**  
(Primary Standard Industrial  
Classification Code Number)

**20-5313323**  
(I.R.S. Employer  
Identification Number)

**664 Cruiser Lane  
Belgrade, Montana 59714  
(406) 388-0480**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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**Sean E. Browne  
President and Chief Executive Officer  
Xtant Medical Holdings, Inc.  
664 Cruiser Lane  
Belgrade, Montana 59714  
(406) 388-0480**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

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*Copies to:*

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Fox Rothschild LLP  
222 South Ninth Street, Suite 2000  
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Approximate date of commencement of proposed sale to the public: From time to time after this registration statement becomes effective as determined by the selling stockholders.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

**CALCULATION OF REGISTRATION FEE**

| <b>Title of each class of securities to be registered<sup>(1)</sup></b> | <b>Amount to be registered<sup>(1)</sup></b> | <b>Proposed maximum offering price per share<sup>(2)</sup></b> | <b>Proposed maximum aggregate offering price<sup>(2)</sup></b> | <b>Amount of registration fee</b> |
|---|--|--|--|-----------------------------------|
| Common Stock, par value \$0.000001 per share                            | 58,754,394                                   | \$ 1.19  | \$ 69,917,728.86   | \$ 7,628.02                       |

(1) The amount to be registered hereunder consists of an aggregate of 58,754,394 shares of common stock to be sold by the selling stockholders named in this registration statement. In addition, pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this registration statement includes an indeterminate number of additional shares that may be offered and sold to prevent dilution resulting from stock splits, stock dividends or similar transactions.

(2) Estimated solely for the purpose of calculating the amount of registration fee pursuant to Rule 457(c) under the Securities Act, based upon the average of the high and low sale prices of the registrant's shares of common stock on December 16, 2020, as reported on the NYSE American.

**The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission becomes effective. This prospectus is not an offer to sell these securities, and neither we nor the selling stockholders are soliciting offers to buy these securities in any state where the offer or sale of these securities is not permitted.**

**SUBJECT TO COMPLETION, DATED DECEMBER 18, 2020**

PRELIMINARY PROSPECTUS

**58,754,394 SHARES OF COMMON STOCK**



This prospectus relates to the resale, from time to time, of up to an aggregate of 58,754,394 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 donees, pledgees, transferees, assignees or other successors-in-interest. The selling stockholders acquired these shares from us upon the exchange of shares of our common stock for approximately \$40.8 million of the aggregate outstanding principal amount of the loans outstanding under the Second Amended and Restated Credit Agreement, dated March 29, 2019, by and among us, Bacterin International, Inc., Xtant Medical, Inc., X-spine Systems, Inc., and the selling stockholders, as well as, without duplication, approximately \$21.1 million of the outstanding amount of PIK Interest (as defined in the Second Amended and Restated Credit Agreement), plus all other accrued and unpaid interest on such loans and PIK Interest outstanding as of the closing date, at an exchange price of \$1.07 per share. In addition, we issued additional shares of our common stock in exchange for a portion of the prepayment fee payable under the Second Amended and Restated Credit Agreement in respect of the loans and PIK Interest described above.

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 21 of this prospectus.

Our common stock is listed on the NYSE American under the symbol “XTNT.” On December 16, 2020, the last reported sale price of our common stock on the NYSE American was \$1.20 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 \_\_\_\_\_, 2020.

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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 24 of this prospectus and “*Incorporation of Certain Information by Reference*” beginning on page 23 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 these securities 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 and sell our products in the United States largely through independent distributors and stocking agents, augmented by direct employees. We have an extensive distribution channel of commissioned independent agents and stocking agents 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 independent health delivery network hospitals and through group purchasing organizations (“GPOs”). We have biologics contracts with major GPOs, as well as extensive access to integrated delivery networks across the United States for both our biologics and spine hardware products. We promote and sell our products internationally through distribution partners in 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.

### Our Recent Debt Restructuring

On August 10, 2020, we announced that we entered into a Restructuring and Exchange Agreement (the “Restructuring Agreement”) with OrbiMed Royalty Opportunities II, LP (“Royalty Opportunities”) and ROS Acquisition Offshore LP (“ROS”), pursuant to which the parties thereto agreed, subject to the terms and conditions set forth therein, to take certain actions as set forth therein (collectively, the “Restructuring Transactions”) in furtherance of a restructuring of our outstanding indebtedness under that certain Second Amended and Restated Credit Agreement, dated as of March 29, 2019, by and among the Company, Bacterin International, Inc., Xtant Medical, Inc., X-spine Systems, Inc., Royalty Opportunities and ROS, as amended (the “Second A&R Credit Agreement”).

The primary purpose of the Restructuring Transactions was to improve our capital structure by reducing our outstanding debt, which we expect will facilitate future access to capital markets for investment in our growth initiatives, and regain compliance with the NYSE American continued listing standards, which we did on October 5, 2020. The Restructuring Transactions included, among others:

- an amendment to the Company’s Amended and Restated Certificate of Incorporation, as amended, to increase the number of authorized shares of our common stock from 75 million to 300 million (the “Charter Amendment”), which was effective on October 1, 2020;
- the exchange by the Company of shares of our common stock for approximately \$40.8 million of the aggregate outstanding principal amount of loans outstanding held by the Royalty Opportunities and ROS under the Second A&R Credit Agreement, as well as, without duplication, approximately \$21.1 million of the outstanding amount of PIK Interest (as defined in the Second A&R Credit Agreement) (such loans and PIK Interest, the “Exchanging Loans”), plus all other accrued and unpaid interest on the Exchanging Loans outstanding as of the closing date, at an exchange price of \$1.07 per share, representing the average closing price of our common stock over the 10 trading days immediately prior to the parties entering into the Restructuring Agreement, and resulting in the issuance of approximately 57.8 million shares of our common stock on October 1, 2020 (the “Share Issuance”);
- the execution of an amendment to the Second A&R Credit Agreement by the parties thereto to change certain provisions therein, including extinguishing loans in an aggregate principal amount equal to the Exchanging Loans outstanding thereunder together with all accrued and unpaid interest thereon, adding loans in an aggregate principal amount equal to a portion of the prepayment fee payable thereunder in respect of the Exchanging Loans, with the remaining portion of the prepayment fee exchanged for an additional 0.9 million shares of our common stock, reducing the amount of credit availability thereunder, decreasing the interest rate and eliminating certain financial covenants, which occurred on October 1, 2020; and
- the launch by the Company of a rights offering to allow stockholders of the Company to purchase up to an aggregate of \$15 million of our common stock at the same price per share as the \$1.07 per share exchange price used to exchange the Exchanging Loans into our common stock as part of the Share Issuance (the “Rights Offering”), which commenced on November 5, 2020 and expired on December 4, 2020.

The closing of the Restructuring Transactions occurred on October 1, 2020.

As a condition to the closing of the Restructuring Transactions, on October 1, 2020, we entered into a Registration Rights Agreement with Royalty Opportunities and ROS (the “Registration Rights Agreement”). The Registration Rights Agreement requires us to, among other things, file with the SEC a shelf registration statement covering the resale, from time to time, of the shares of our common stock issuable upon exchange of the Exchanging Loans and the prepayment fee shares no later than the 90th day after the Closing Date, as defined in the Restructuring Agreement, and use our best efforts to cause the shelf registration statement to become effective under the Securities Act no later than the 180th day after the Closing Date. The registration statement of which this prospectus is a part has been filed to satisfy this obligation.

### **The Offering**

|   |  |
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| Common stock to be offered by the selling stockholders: | Up to 58,754,394 shares  |
| Common stock to be outstanding after the offering:      | 77,573,680 shares (based on 77,573,680 shares outstanding as of December 15, 2020)   |
| 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 10 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 10 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, 2019, filed with the SEC on March 5, 2020, and our most recent Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2020, filed with the SEC on October 29, 2020, 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

***Sales of shares in connection with this offering may cause the market price of our common stock to decline.***

In connection with our recent debt restructuring, we entered into a Registration Rights Agreement with the selling stockholders pursuant to which we agreed to register for resale with the SEC the shares of common stock issued to the selling stockholders in the Restructuring Transactions. The registration statement of which this prospectus is a part has been filed to satisfy this obligation. Upon the effectiveness of the registration statement, the shares we issued in the Restructuring Transactions may be freely sold in the open market. The sale of a significant amount of these shares of common stock in the open market, or the perception that these sales may occur, could cause the market price of our common stock to decline or become highly volatile.

***The sale or availability for sale of substantial amounts of our common stock or other equity securities could adversely affect the market price of our common stock.***

Sales of substantial amounts of our common stock in the public market, or the perception that these sales could occur, 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 securities beneficially owned by the selling stockholders or any other stockholder or the availability of these securities for future sale will have on the market price of our common stock.

***Our common stock price may be volatile.***

The trading price of our common stock may fluctuate substantially depending on many factors, some of which are beyond our control and may not be directly related to our operating performance. These factors include, but are not limited to, the following:

- the terms of any potential future transaction(s) related to debt financing, debt restructuring or capital raising;
- our ability to make interest payments under our Second A&R Credit Agreement;
- our observance of covenants under our Second A&R Credit Agreement;
- 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;
- the delisting of our common stock or halting or suspension of trading in our common stock by the NYSE American;
- economic and other external factors; and
- general market conditions.



Additionally, the stock market historically has experienced significant price and volume fluctuations. These fluctuations are often unrelated to the operating performance of particular companies. These broad market fluctuations, such as those caused by the global novel strain of coronavirus, or COVID-19, pandemic may cause declines in the trading price and market value of our common stock.

***Shares of our common stock are equity securities and are subordinate to our outstanding indebtedness, which is significant.***

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 Second A&R Credit Agreement 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 Second A&R Credit Agreement precludes 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.

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

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 15, 2020, we had outstanding warrants to purchase approximately 421,278 shares of our common stock, stock options to purchase 2,176,272 shares of our common stock and restricted stock unit awards covering 2,503,021 shares of our common stock under the Xtant Medical Holdings, Inc. Amended and Restated 2018 Equity Incentive Plan, options to purchase 14,699 shares of our common stock under our prior equity compensation plan, and 3,507,165 shares available for issuance under the Xtant Medical Holdings, Inc. Amended and Restated 2018 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.

***Anti-takeover provisions in our organizational documents and agreements may discourage or prevent a change in control, even if a sale of the 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 Amended and Restated Certificate of Incorporation, as amended (the “Certificate of Incorporation”) and Second Amended and Restated Bylaws (the “Bylaws”) and our Investor Rights Agreement, dated as of February 14, 2018 with Royalty Opportunities and ROS (“Investor Rights Agreement”), 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 Certificate of Incorporation 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 chairman 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.
- 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 Certificate of Incorporation related to the amendment of our Bylaws, the Board of Directors and our stockholders as well as the general provisions of our Certificate of Incorporation.
- 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 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 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 of Xtant 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 Certificate of Incorporation or our Bylaws, or (iv) any action asserting a claim governed by the internal-affairs doctrine.
- The Investor Rights Agreement includes director nomination rights, which provide that so long as the Ownership Threshold (as defined in the Investor Rights Agreement) is met, Royalty Opportunities and ROS are entitled to nominate such individuals to the Board of Directors constituting a majority of the directors. In addition, under the Investor Rights Agreement, so long as the Ownership Threshold is met, certain matters require the approval of Royalty Opportunities and ROS to proceed with such a transaction, including without limitation, the sale, transfer or other disposition of assets or business of the Company or its subsidiaries with a value in excess of \$250,000 in the aggregate during any fiscal year (other than sales of inventory or supplies in the ordinary course of business, sales of obsolete assets (excluding real estate), sale-leaseback transactions and accounts receivable factoring transactions).

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 Certificate of Incorporation 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 Certificate of Incorporation provides that the Court of Chancery of the State 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 to us or our stockholders by any of our directors, officers, or other employees, (iii) any action asserting a claim against us arising under the DGCL or (iv) any action asserting a claim against us that is governed by the internal affairs doctrine. Stockholders in our Company will be deemed to have notice of and have consented to the provisions of our Certificate of Incorporation related to choice of forum. The choice of forum provision in our Certificate of Incorporation may limit the ability of our stockholders to obtain a favorable judicial forum for disputes with us.

***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, increase our costs 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 (the “Exchange Act”), and the corporate governance standards of the Sarbanes-Oxley Act of 2002 (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 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.

***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 Second A&R Credit Agreement 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.

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

Our Certificate of Incorporation authorizes our Board of Directors, without the approval of our stockholders, to issue up to 10,000,000 shares of our preferred stock, subject to limitations prescribed by applicable law, rules and regulations and the provisions of our Certificate of Incorporation. The preferred stock may be issued from time to time in one or more series. The Board of Directors is authorized to fix the number of shares to be included in any series and to determine the designation, powers, rights, preferences, qualifications, limitations, privileges and restrictions, if any, of each such series. 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 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. 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). On October 5, 2020, we regained compliance with these continued listing requirements as a result of our debt restructuring. No assurance can be provided that we will continue to comply with these continued listing requirements. 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 Company's business, operating results and financial condition have been and will likely continue to be materially adversely affected by the global novel strain of coronavirus (COVID-19) pandemic, which may adversely impact the trading price of our common stock.***

Since March 2020, the COVID-19 pandemic has caused business closures, severe travel restrictions and implementation of social distancing measures. At the onset of the COVID-19 pandemic, hospitals and other medical facilities cancelled or deferred elective procedures, diverted resources to patients suffering from infections and limited access for non-patients, including our direct and indirect sales representatives. Because of the COVID-19 pandemic, surgeons and their patients have been, and may continue to be, required, or are choosing, to defer procedures in which our products otherwise would be used, and many facilities that specialize in the procedures in which our products otherwise would be used have experienced temporary closures or reduced operating hours. These circumstances have negatively impacted, and may continue to negatively impact, the ability of our employees, independent sales representatives and distributors to effectively market and sell our products, which has had and will likely continue to have a material adverse effect on our revenues. In addition, even after the easing of such restrictions such that governmental orders no longer prohibit or recommend against performing such procedures, patients may continue to defer such procedures out of concern of being exposed to coronavirus or for other reasons.

The COVID-19 pandemic has also caused adverse effects on general commercial activity and the global economy, which has led to an economic slowdown and recession and could cause other unpredictable events, any of which could adversely affect our business, operating results or financial condition. The adverse effect of the pandemic on the broader economy also will likely negatively affect demand for procedures using our products, both in the near- and long-term. In addition, as a result of this negative effect on our economy, one or more of our distributors, independent sales representatives, customers, contract manufacturers and suppliers may experience financial distress, cancel, postpone or delay orders, be unable to perform under a contract, file for bankruptcy protection, go out of business, or suffer disruptions in their business or we may need to offer special payment terms or relief to our distributors, independent sales representatives and customers. Accordingly, we believe we will be exposed to heightened credit risk as a result of the pandemic. This could adversely impact our ability to manufacture and provide products and otherwise operate our business, as well as increase our costs and expenses.

The anticipated decline in our revenues and adverse impact on our other operating results could impact our debt covenants under our credit facility and our ability to access funding thereunder. We may need to borrow funds from alternative sources, such as other lenders and institutions or government agencies. There can be no guarantee that such borrowing will be available or available on favorable terms or without restrictions that may otherwise impair our operating flexibility. The COVID-19 pandemic has also led to and could continue to lead to severe disruption and volatility in the global capital markets, which could increase our cost of future capital and adversely affect our ability to access the capital markets in the future.

The foregoing and other continued disruptions to our business as a result of COVID-19 have resulted and could continue to result in a material adverse effect on our business, operating results, financial condition, prospects and the trading price of our common stock in the near-term and beyond 2020. The full extent to which the COVID-19 pandemic will impact our business will depend on future developments that are highly uncertain and cannot be accurately predicted, including new information that may emerge concerning COVID-19 and the actions to contain it or treat its impact.

#### **Risks Related to our Recent Debt Restructuring**

***ROS and Royalty Opportunities have beneficial ownership of a significant percentage of our common stock, have the right to designate a majority of our Board of Directors, and are able to exert significant control over matters subject to stockholder approval, preventing other stockholders and new investors from influencing significant corporate decisions.***

As of December 15, 2020, ROS and Royalty Opportunities collectively owned approximately 93.9% of our outstanding common stock. Royalty Opportunities is also the lender under our Second A&R Credit Agreement and holds all of our outstanding indebtedness thereunder.

In addition, we are party to the Investor Rights Agreement with Royalty Opportunities and ROS under which they are permitted to nominate a majority of the directors and designate the chairperson of our Board of Directors at subsequent annual meetings, as long as they maintain an ownership threshold in our Company of at least 40% of our then outstanding common stock. If ROS and Royalty Opportunities are unable to maintain the Ownership Threshold, the Investor Rights Agreement contemplates a reduction of nomination rights commensurate with their ownership interests. In addition, under the Investor Rights Agreement, for so long as the Ownership Threshold is met, we must obtain the approval of a majority of our common stock held by ROS and Royalty Opportunities to proceed with the following actions: (i) issue new securities; (ii) incur over \$250,000 of debt in a fiscal year; (iii) sell or transfer over \$250,000 of our assets or businesses or our subsidiaries in a fiscal year; (iv) acquire over \$250,000 of assets or properties in a fiscal year; (v) make capital expenditures over \$125,000 individually, or \$1,500,000 in the aggregate during a fiscal year; (vi) approve our annual budget; (vii) hire or terminate our chief executive officer; (viii) appoint or remove the chairperson of our Board of Directors; and (ix) make loans to, investments in, or purchase, or permit any subsidiary to purchase, any stock or other securities in another entity in excess of \$250,000 in a fiscal year. As long as the Ownership Threshold is met, we may not increase the size of our Board of Directors beyond seven directors without the approval of a majority of the directors nominated by ROS and Royalty Opportunities. The Investor Rights Agreement also grants Royalty Opportunities and ROS the right to purchase from us a pro rata amount of any new securities that we may propose to issue and sell.

Because of their significant share ownership and control, ROS and Royalty Opportunities and their respective affiliates have the ability to exert substantial influence or actual control over our management and affairs and over substantially all matters requiring action by our stockholders, including amendments to our Certificate of Incorporation, Bylaws, election and removal of directors, the appointment of management, future issuances of our common stock or other securities, payment of dividends, if any, on our common stock, the incurrence or modification of indebtedness by us, any proposed merger, consolidation or sale of all or substantially all of our assets and other corporate transactions. The interests of ROS and Royalty Opportunities may not in all cases be aligned with the interests of our other stockholders. In addition, ROS and Royalty Opportunities and their respective affiliates may have an interest in pursuing acquisitions, divestitures and other transactions that, in their judgment, could enhance their investment, even though such transactions might involve risks to our other stockholders. For example, ROS and Royalty Opportunities and their respective affiliates could cause us to make acquisitions that increase our indebtedness or cause us to sell revenue-generating assets. In addition, ROS and Royalty Opportunities and their respective affiliates are able to determine the outcome of all matters requiring stockholder approval and are able to cause or prevent a change of control of our Company or a change in the composition of our Board of Directors and could preclude any acquisition of our Company. This concentration of voting control could deprive our other stockholders of an opportunity to receive a premium for their shares of common stock as part of a sale of our Company and ultimately might affect the market price of our common stock.

***We are a “controlled company” within the meaning of the NYSE American rules and rely on exemptions from various corporate governance requirements that provide protection to stockholders of other companies.***

We are a “controlled company” as defined in section 801(a) of the NYSE American Company Guide because more than 50% of the combined voting power of all of our outstanding common stock is beneficially owned by OrbiMed Advisors LLC. As a “controlled company,” we are exempt from certain NYSE American rules requiring our Board of Directors to have a majority of independent members, a compensation committee composed entirely of independent directors and a nominating committee composed entirely of independent directors. These independence standards are intended to ensure that directors who meet those standards are free of any conflicting interest that could influence their actions as directors. We rely on NYSE American’s controlled company exemptions and do not have a majority of independent directors on the Board of Directors, an independent nomination and governance committee or an independent compensation committee. Accordingly, our stockholders do not have the same protections afforded to stockholders of companies that are subject to all of the corporate governance requirements of the NYSE American rules.

***We may not realize the intended benefits of our recent debt restructuring.***

We believe that entering into the Restructuring Agreement and our recent debt restructuring was a significant step toward reducing our outstanding debt, which we expect will facilitate future access to capital markets for investment in our growth initiatives. However, there can be no guarantee that we will realize the intended benefits of the debt restructuring immediately, if at all. There is no assurance that our revenues, operating results and profitability will improve as a result of the debt restructuring.

## 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 applicable securities laws. 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:

- our ability to service our debt and comply with the covenants in the Second A&R Credit Agreement;
- our ability to maintain sufficient liquidity to fund our operations and obtain financing on reasonable terms when needed;
- our future financial performance, including our ability to increase or maintain revenue;
- the effect of the COVID-19 pandemic on our business, operating results and financial condition, including disruption to our customers, distributors, independent sales representatives, contract manufacturers and suppliers, as well as the global economy and financial and credit markets;
- our ability to remain competitive;
- our ability to innovate and develop new products;
- our ability to obtain donor cadavers for our products from a limited number of third-party suppliers;
- public acceptance of biologics products;
- our ability to engage and retain qualified technical personnel and members of our management team;
- product liability claims and any litigation to which we may be subjected;
- our ability to successfully integrate future business combinations or acquisitions;
- our ability to retain and recruit independent sales agents;
- the ability of our sales force to achieve expected results;
- the impact of worldwide economic conditions, which could adversely affect our revenue, financial condition, or results of operations;
- our ability to use our net operating loss carry-forwards to offset future taxable income;
- the effect of government regulations, our ability to obtain and maintain regulatory approvals in the United States and abroad and government and third-party coverage and reimbursement for our products;
- timing and results of clinical studies;
- product recalls and defects;
- our ability to remain accredited with the American Association of Tissue Banks; 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, and our most recent Annual Report on Form 10-K, filed with the SEC on March 5, 2020, and our most recent Quarterly Report on Form 10-Q, filed with the SEC on October 29, 2020.

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. We caution you that the forward-looking statements contained in this prospectus are not guarantees of future performance, and we cannot assure you that those statements will be realized or that the forward-looking events and circumstances will occur. All forward-looking statements speak only as of the date of this prospectus. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required under applicable securities laws. The cautionary statements qualify all forward-looking statements attributable to us or persons acting on our behalf.

You should also read carefully the factors described in the “*Risk Factors*” in our most recent Annual Report on Form 10-K for the year ended December 31, 2019, filed with the SEC on March 5, 2020, and our most recent Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2020, filed with the SEC on October 29, 2020, and in any other documents incorporated by reference into this prospectus, as updated by our future filings, to better understand significant risks and uncertainties inherent in our business and underlying any forward-looking statements. As a result of these factors, actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements in this report, and you should not place undue reliance on any forward-looking statements.

## 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 15 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 and will reimburse the selling stockholders for the reasonable fees and disbursements of one firm or counsel to act as counsel for the selling stockholders in connection with this offering.

## 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 NYSE American under the ticker symbol “XTNT.”

### Holder of Record

As of December 15, 2020, we had 175 holders of record. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose common stock may be held in trust or by other entities.

### Dividends

We have not paid any cash dividends and do not expect to do so in the foreseeable future. In addition, our Second A&R Credit Agreement precludes 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 preferred stock and does not purport to be complete. It is subject to and qualified in its entirety by reference to the provisions of our Certificate of Incorporation, Bylaws and the Investor Rights Agreement, 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 Certificate of Incorporation, our Bylaws, the Investor Rights Agreement and the applicable provisions of the DGCL for additional information.

### **Authorized and Outstanding Capital Stock**

Our Certificate of Incorporation provides that we have authority to issue (i) 300 million shares of our common stock, par value \$0.000001 per share, 77,573,680 of which are issued and outstanding as of December 15, 2020, after giving effect to the Restructuring Transactions and (ii) 10,000,000 shares of preferred stock, par value \$0.000001 per share, none of which are issued and outstanding as of the date of this prospectus. As of December 15, 2020, we had outstanding warrants to purchase approximately 421,278 shares of our common stock, stock options to purchase 2,176,272 shares of our common stock and restricted stock unit awards covering 2,503,021 shares of our common stock under the Xtant Medical Holdings, Inc. Amended and Restated 2018 Equity Incentive Plan, options to purchase 14,699 shares of our common stock under our prior equity compensation plan, and 3,507,165 shares available for issuance under the Xtant Medical Holdings, Inc. Amended and Restated 2018 Equity Incentive Plan.

### **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 Certificate of Incorporation, 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***

Our Board of Directors may authorize, and we may make, distributions to our stockholders, subject to any restriction in our Certificate of Incorporation, 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 Certificate of Incorporation 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 Certificate of Incorporation and Bylaws do not restrict the ability of a holder of our common stock to transfer his, her or its shares of our 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 EQ Shareowner Services.

### ***Principal Market for our Common Stock***

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

### **Preferred Stock**

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.

### **Anti-Takeover Provisions**

Anti-takeover provisions in our Certificate of Incorporation, Bylaws and Investor Rights Agreement and our status as a controlled company may discourage or prevent a change in control, even if such a sale could be beneficial to our stockholders.

#### ***Certificate of Incorporation and Bylaws***

Our Certificate of Incorporation 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 the 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 our 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 chairman 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.
- 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 Certificate of Incorporation related to the amendment of our Bylaws, the Board of Directors and our stockholders as well as the general provisions of our Certificate of Incorporation.
- 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 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 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 of the Company to us or our stockholders, (iii) any action asserting a claim arising under any provision of the DGCL, our Certificate of Incorporation, or our Bylaws, or (iv) any action asserting a claim governed by the internal-affairs doctrine.

## ***Investor Rights Agreement***

We are party to an Investor Rights Agreement, which includes certain provisions that may have an anti-takeover effect of delaying, deferring or preventing a change in control of the Company. The Investor Rights Agreement includes director nomination rights, which provide that so long as the Ownership Threshold (as defined in the Investor Rights Agreement) is met, Royalty Opportunities and ROS are entitled to nominate such individuals to the Board of Directors constituting a majority of the directors. In addition, under the Investor Rights Agreement, so long as the Ownership Threshold is met, certain matters require the approval of Royalty Opportunities and ROS to proceed with such a transaction, including without limitation, the sale, transfer or other disposition of assets or businesses of the Company or its subsidiaries with a value in excess of \$250,000 in the aggregate during any fiscal year (other than sales of inventory or supplies in the ordinary course of business, sales of obsolete assets (excluding real estate), sale-leaseback transactions and accounts receivable factoring transactions).

## ***Controlled Company Status***

We are a “controlled company” as defined in section 801(a) of the NYSE American Company Guide because more than 50% of the combined voting power of all of our outstanding common stock is beneficially owned by OrbiMed Advisors LLC. Our status as a controlled company may have an anti-takeover effect of delaying, deferring or preventing a change in control of the Company.

## ***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 Certificate of Incorporation that limit or eliminate the liability of our directors 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 derived an improper personal benefit. Accordingly, our directors will not be personally liable for monetary damages for breach of their fiduciary duties as directors, 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;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the DGCL; or
- any transaction from which the director derived an improper personal benefit.

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 liability, then the liability of our directors 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 shares of common stock offered under this prospectus may be offered from time to time by the selling stockholders named below or by any of their pledgees, donees, transferees or other successors-in-interest. As used in this prospectus, the term “selling stockholder” includes those selling stockholders identified below and any donees, pledgees, transferees or other successors-in-interest selling shares received after the date of this prospectus from a selling stockholder as a gift, pledge or other non-sale related transfer. All of the selling stockholders named below acquired the shares of common stock being offered under this prospectus directly from us. We issued the shares to the selling stockholders in reliance on an exemption from the registration requirements of the Securities Act pursuant to Section 4(a)(2) of the Securities Act and Rule 506 promulgated thereunder.

The following table sets forth as of December 15, 2020: (1) the name of each selling stockholder for whom we are registering shares of common stock under the registration statement of which this prospectus is a part, (2) the number of shares of common stock beneficially owned by each of the selling stockholders prior to the offering, determined in accordance with Rule 13d-3 under the Exchange Act, (3) the number of shares of common stock that may be offered by each selling stockholder under this prospectus and (4) the number of shares of common stock to be owned by each selling stockholder after completion of this offering. 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 December 15, 2020. The percentage of beneficial ownership for the following table is based on 77,573,680 shares of common stock outstanding as of December 15, 2020.

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<br>Prior to the Offering |            | Number of<br>Shares<br>Being<br>Offered | Shares Beneficially<br>Owned After Completion<br>of the Offering |            |
|---|--|------------|---|--|------------|
|   | Number <sup>(1)</sup>                              | Percentage |   | Number   | Percentage |
| ROS Acquisition Offshore LP <sup>(2)</sup>          | 55,766,352   | 71.9%      | 46,784,775                              | 8,981,577  | 11.6%      |
| OrbiMed Royalty Opportunities II, LP <sup>(3)</sup> | 17,036,720   | 22.0%      | 11,969,619                              | 5,067,101  | 6.5%       |
| TOTAL   | <u>72,803,072</u>                                  |            | <u>58,754,394</u>                       | <u>14,048,678</u>  |            |

(1) Based solely on information contained in a Schedule 13D/A filed with the SEC on October 5, 2020 and a Form 4 filed with the SEC on November 19, 2020.

(2) These securities are held by record by ROS. OrbiMed Advisors LLC (“OrbiMed Advisors”), a registered adviser under the Investment Advisors Act of 1940, as amended, is the investment manager of ROS. OrbiMed Advisors is also the investment manager of Royalty Opportunities S.à.r.l., of which ROS is a wholly-owned subsidiary. By virtue of such relationships, OrbiMed Advisors may be deemed to have voting and investment power with respect to the securities held by ROS noted above and as a result may be deemed to have beneficial ownership over such securities. OrbiMed Advisors exercises this investment and voting power through a management committee comprised of Carl L. Gordon, Sven H. Borho and Jonathan T. Silverstein, each of whom disclaims beneficial ownership of the securities held by ROS. The principal business address for each of ROS and OrbiMed Advisors is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

(3) These securities are held of record by Royalty Opportunities. OrbiMed ROF II LLC (“ROF II”) is the general partner of Royalty Opportunities, and OrbiMed Advisors is the managing member of ROF II. By virtue of such relationships, OrbiMed Advisors may be deemed to have voting and investment power with respect to the securities held by Royalty Opportunities noted above and as a result may be deemed to have beneficial ownership over such securities. OrbiMed Advisors exercised this investment and voting power through a management committee comprised of Carl L. Gordon, Sven H. Borho and Jonathan T. Silverstein, each of whom disclaims beneficial ownership of the securities held by Royalty Opportunities. The principal business address for each of Royalty Opportunities, ROF II and OrbiMed Advisors is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

## Material Relationships Between Selling Stockholders and Xtant

### *2020 Restructuring Agreement*

On August 7, 2020, we entered into the Restructuring Agreement with Royalty Opportunities and ROS, pursuant to which the parties thereto agreed, subject to the terms and conditions set forth therein, to complete the Restructuring Transactions in furtherance of a restructuring of our outstanding indebtedness under that certain Second A&R Credit Agreement. The Restructuring Transactions included, among others, the Charter Amendment, the Share Issuance, the execution of an amendment to the Second A&R Credit Agreement by the parties thereto to change certain provisions therein, and the launch of the Rights Offering.

Immediately after the execution of the Restructuring Agreement by the parties thereto, we solicited and obtained the written consent of Royalty Opportunities and ROS, the holders of an aggregate of 9,248,678 shares of our common stock as of August 7, 2020 (the "Consenting Majority Stockholders"), representing a majority of the outstanding shares of our common stock as of such date, for the approval of the Charter Amendment and the Share Issuance, in accordance with applicable provisions of the DGCL and the Company's Bylaws. The written consent of the Consenting Majority Stockholders was sufficient to approve the Charter Amendment and the Share Issuance. Therefore, no proxies or additional consents were solicited by us in connection with the Charter Amendment and the Share Issuance. Pursuant to Section 14(c) of the Exchange Act, and the rules and regulations promulgated thereunder, on September 10, 2020, we sent a definitive information statement to all holders of our common stock as of August 7, 2020 for the purpose of informing such stockholders of the written actions taken by the Consenting Majority Stockholders. In accordance with Exchange Act Rule 14c-2, the stockholder consent of the Consenting Majority Stockholders could not become effective until at least 20 calendar days following the mailing of the Information Statement.

On October 1, 2020, the closing of the Restructuring Transactions, other than the Rights Offering, occurred, and in connection therewith, the following actions took place:

- the Charter Amendment was filed with the Office of the Secretary of State of the State of Delaware;
- the Share Issuance occurred;
- an amendment to the Second A&R Credit Agreement was executed by the parties thereto, and in connection therewith, the Company issued an additional 0.9 million shares of Common Stock in exchange for a portion of the prepayment fee payable under the Second A&R Credit Agreement in respect of the Exchanging Loans; and
- the Registration Rights Agreement was executed by the parties thereto.

As a result of the completion of these Restructuring Transactions, Royalty Opportunities and ROS owned immediately thereafter, in the aggregate, approximately 94.5% of our outstanding common stock, and all other existing stockholders of the Company own approximately 5.5% of our outstanding common stock.

Pursuant to the terms of the Restructuring Agreement, we commenced the Rights Offering to allow our stockholders as of the November 5, 2020 record date to purchase up to an aggregate of 14,018,690 shares of our common stock at a subscription price of \$1.07 per share, the same price per share as the \$1.07 per share exchange price used in the Share Issuance. The rights offering expired on December 4, 2020. We issued 712,646 shares of common stock in the Rights Offering and received \$762,531 in gross proceeds.

### *2020 Registration Rights Agreement*

Effective October 1, 2020, we entered into a Registration Rights Agreement with Royalty Opportunities and ROS, which requires us, among other things, to file with the SEC a shelf registration statement covering the resale, from time to time, of our common stock that was issued pursuant to the Share Issuance no later than December 30, 2020 and use our best efforts to cause the shelf registration statement to become effective under the Securities Act no later than March 30, 2021. The registration statement, of which this prospectus is a part, was filed pursuant to our obligations under the Registration Rights Agreement.

## *Second A&R Credit Agreement and Warrant Issuance*

On March 29, 2019, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into the Second A&R Credit Agreement with Royalty Opportunities and ROS, which amended and restated the prior Amended and Restated Credit Agreement dated as of July 27, 2015 among the parties thereto (the “Prior Credit Agreement”), and as subsequently amended through the Twenty-Fifth Amendment to the Amended and Restated Credit Agreement to change certain provisions therein. Under the Second A&R Credit Agreement:

- we were able to continue to make requests for term loans in amounts equal to the remaining commitment for additional delayed draw loans, which was approximately \$2.2 million as of the date of the Second A&R Credit Agreement, and request additional term loans with the lenders in an aggregate amount of up to \$10.0 million, with the amount of each loan draw to be subject to our production of a thirteen-week cash flow forecast that is approved by Royalty Opportunities and ROS and which shows a projected cash balance for the following two-week period of less than \$1.5 million, as well as the satisfaction (or waiver in writing by Royalty Opportunities and ROS) of conditions precedent, including closing certificate, delivery of budget, and other satisfactory documents;
- no interest would accrue on the loans under the Second A&R Credit Agreement from and after January 1, 2019 until March 31, 2020;
- beginning April 1, 2020 through the maturity date of the Second A&R Credit Agreement, interest payable in cash will accrue on the loans under the agreement at a rate per annum equal to the sum of (a) 10.00% plus (b) the higher of (x) the LIBO Rate (as such term is defined in the Second A&R Credit Agreement) and (y) 2.3125%;
- the maturity date of the loans is March 31, 2021;
- the Consolidated Senior Leverage Ratio and Consolidated EBITDA (as such terms were defined in the Prior Credit Agreement) financial covenants were deleted, and a new Revenue Base (as such term is defined in the Second A&R Credit Agreement) financial covenant was added; and
- the key person event default provision was revised to refer specifically to certain then recently-hired executive officers of the Company.

On April 1, 2019, the Company issued warrants to purchase an aggregate of 1.2 million shares of our common stock to Royalty Opportunities and ROS, with an exercise price of \$0.01 per share and an expiration date of April 1, 2029. The issuance of these warrants was a condition to the effectiveness of the Second A&R Credit Agreement. These warrants have subsequently been exercised in full.

## *First Amendment to Second Amended and Restated Credit Agreement and Warrant Issuance*

On May 6, 2020, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into a First Amendment to the Second Amended and Restated Credit Agreement with Royalty Opportunities and ROS (the “First Amendment”), which among other things, provided that:

- no interest would accrue on the outstanding loans under the Second A&R Credit Agreement from and after March 31, 2020 until September 30, 2020;
- beginning October 1, 2020 through the maturity date of the Second A&R Credit Agreement, interest payable in cash will accrue on the loans under the Second A&R Credit Agreement at a rate per annum equal to the sum of (i) 10.00% plus (ii) the higher of (x) the LIBO Rate (as such term is defined in the Second A&R Credit Agreement) and (y) 2.3125%;
- the maturity date of the loans under the Second A&R Credit Agreement is December 31, 2021;
- the Revenue Base financial covenant was revised through December 31, 2021; and
- the key person event default provision was revised to refer specifically to Sean Browne in lieu of Ron Berlin.

In conjunction therewith, the Company issued warrants to purchase an aggregate of 2.4 million shares of our common stock to Royalty Opportunities and ROS, with an exercise price of \$0.01 per share and an expiration date of May 6, 2030. The issuance of these warrants was a condition to the effectiveness of the First Amendment. These warrants have subsequently been exercised in full.

## *Second Amendment to Second Amended and Restated Credit Agreement and Warrant Issuance*

On October 1, 2020, pursuant to the Restructuring Transactions discussed above, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into a Second Amendment to the Second Amended and Restated Credit Agreement with Royalty Opportunities and ROS (the “Second Amendment”), which among other things, provided for:

- extinguishment by the Royalty Opportunities and ROS of approximately \$61.9 million of principal and paid-in-kind interest outstanding on the loans under the Second A&R Credit Agreement in exchange for approximately 57.8 million shares of our common stock and the addition of a principal amount equal to prepayment fees associated with the loans under the Second A&R Credit Agreement not paid in cash or exchanged for shares of our common stock;
- exchange of approximately \$0.9 million of prepayment fees associated with the loans under the Second A&R Credit Agreement for approximately 0.9 million shares of our common stock;
- elimination of the availability of additional draw loan advances and reduction of available additional term loans to \$5.0 million;
- accrual of interest payable in cash for the remaining term of the Second A&R Credit Agreement at a rate per annum equal to the sum of (i) 7.00% plus (ii) the higher of (x) the LIBO Rate (as such term is defined in the Second A&R Credit Agreement) and (y) 1.00%; and
- elimination of certain financial covenants.

## *Prior Amendments to Prior Credit Agreement and Warrant Issuance*

Prior to the execution of the Second A&R Credit Agreement, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., and Royalty Opportunities and ROS entered into several amendments to our Prior Credit Agreement, including those described below.

Effective December 28, 2017, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., Royalty Opportunities and ROS entered into the Twenty-First Amendment to the Amended and Restated Credit Agreement, which amended the Prior Credit Agreement. This amendment further deferred the Company’s accrued interest payment date until January 31, 2018.

Effective January 30, 2018, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., Royalty Opportunities and ROS entered into the Twenty-Second Amendment to the Amended and Restated Credit Agreement, which amended the Prior Credit Agreement. This amendment further deferred the Company’s accrued interest payment date until February 28, 2018.

Effective February 14, 2018, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., Royalty Opportunities and ROS entered into the Twenty-Third Amendment to the Amended and Restated Credit Agreement, which further amended the Prior Credit Agreement and terms of the facility created under such agreement (the “Credit Facility”). As of result of this amendment, the interest payable was carried forward and as modified, the interest rate options within the Credit Facility were as follows: (a) through December 31, 2018, we would have the option at our sole discretion (i) to pay PIK Interest at LIBOR (as defined in the Credit Facility) plus 12% or (ii) pay cash interest at LIBOR plus 10%; (b) beginning January 1, 2019 through June 30, 2019, we would have the option at our sole discretion to either (i) pay PIK Interest at LIBOR plus 15% or (ii) pay cash interest at LIBOR plus 10%; and (c) beginning July 1, 2019 through the maturity date of the Credit Facility, we would pay cash interest at LIBOR plus 10%. The amendment also reduced the prepayment or repayment fee under the Credit Facility to 1%. This amendment also modified the financial covenants in the Prior Credit Agreement, including removing the minimum revenue covenant, providing a minimum liquidity covenant, a consolidated leverage ratio covenant, and a minimum consolidated EBITDA covenant, all as defined in the Prior Credit Agreement.

On September 17, 2018, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., Royalty Opportunities and ROS entered into the Twenty-Fourth Amendment to the Amended and Restated Credit Agreement, which further amended the Prior Credit Agreement and terms of the Credit Facility, effective as of April 1, 2018. Under the terms of this amendment, no interest would be charged on the loans under the Credit Facility from April 1, 2018 until June 30, 2018. Due to the interest rate relief provided by this amendment, the Company performed an assessment of the changes to the terms of the Credit Facility in accordance with Accounting Standards Codification 470, Debt. The Credit Facility was modified based on an evaluation of the present value of cash flows for the old and new debt instruments. Given the modification, a new effective interest rate of 13.45% for the modified loan was calculated based on the carrying amount of the debt and the present value of the revised future cash flows. The modified interest rate is effective through the remaining life of the loan.

On September 17, 2018, the Company and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., Royalty Opportunities and ROS entered into the Twenty-Fifth Amendment to the Amended and Restated Credit Agreement, which further amended the Prior Credit Agreement and terms of the Credit Facility, effective as of August 1, 2018. Under the terms of this amendment:

- no interest would be charged on the Loans under the Credit Facility from July 1, 2018 until December 31, 2018;
- the Optional PIK Interest (as such term is defined in the Prior Credit Agreement) was decreased from 15% plus the LIBO Rate (as such term is defined in the Prior Credit Agreement) to 10% plus the LIBO Rate, with a 2.3125% floor;
- a LIBO Rate floor of 2.3125% was added; and
- the fee due upon payment, prepayment or repayment of the principal amount of the loans under the Credit Facility, whether on the maturity date or otherwise, was increased to 2% from 1% of the aggregate principal amount of such payment, prepayment or repayment.

On September 17, 2018, the Company issued warrants to purchase an aggregate of 1.2 million shares of Company common stock to the Investors, with an exercise price of \$0.01 per share and an expiration date of August 1, 2028. The issuance of these warrants was a condition to the effectiveness of this amendment. These warrants have subsequently been exercised in full.

#### *2018 Restructuring Agreement*

On January 11, 2018, we entered into a Restructuring and Exchange Agreement (the “Prior Restructuring Agreement”) with Royalty Opportunities, ROS, and certain other stockholders. Pursuant to the Prior Restructuring Agreement, and following the execution of an amendment to the indenture governing our then outstanding 6% convertible senior unsecured notes due 2021 (the “2017 Notes”), on January 17, 2018, ROS and Royalty Opportunities converted the 2017 Notes, plus accrued and unpaid interest, at the \$9.11 per share conversion rate originally provided thereunder, into 189,645 shares of our common stock.

On February 14, 2018, following approval by our stockholders and after completion of the 1-for-12 reverse stock split, the remaining \$70.238 million aggregate principal amount of the notes held by the selling stockholders, plus accrued and unpaid interest, was exchanged for newly-issued shares of our common stock at an exchange rate of 138.8889 shares per \$1,000 principal amount of notes, for an exchange price of \$7.20 per share (the “Notes Exchange”). This resulted in the issuance of 10,401,309 shares of our common stock to Royalty Opportunities, ROS, and certain other stockholders and Royalty Opportunities and ROS acquiring an approximately 70% controlling interest in our outstanding shares of our common stock. Upon completion of the Notes Exchange, all outstanding obligations under our convertible senior secured notes were satisfied in full and the indentures governing such notes were discharged.

Pursuant to the terms of the Prior Restructuring Agreement, we commenced a rights offering to allow our stockholders as of the April 27, 2018 record date to purchase up to an aggregate of 1,137,515 shares of our common stock at a subscription price of \$7.20 per share. The rights offering expired on June 18, 2018. We issued 129 shares of common stock in the rights offering and received \$0.9 thousand in gross proceeds.

#### *Private Placement SPA*

On February 14, 2018, we entered into a Securities Purchase Agreement (the “Private Placement SPA”) with ROS and Royalty Opportunities. Pursuant to the Private Placement SPA, on February 14, 2018, ROS and Royalty Opportunities purchased from us a total of 945,819 shares of our common stock, at a price of \$7.20 per share, for aggregate proceeds of \$6,809,896. Under the Private Placement SPA, 603,687 of such shares of our common stock were issued to ROS and 342,132 of such shares of common stock were issued to Royalty Opportunities.



### *Registration Rights Agreement*

Effective February 14, 2018, we entered into a Registration Rights Agreement (the “Prior Registration Rights Agreement”) with ROS and Royalty Opportunities and certain other stockholders. The Prior Registration Rights Agreement required us, among other things, to file with the SEC a shelf registration statement within 90 days of the date of the Prior Registration Rights Agreement covering the resale, from time to time, of our common stock issued. The corresponding registration statement became effective on June 4, 2018.

### *Investor Rights Agreement*

Effective February 14, 2018, we entered into an Investor Rights Agreement (the “Investor Rights Agreement”) with Royalty Opportunities, ROS, and certain other stockholders. Under the Investor Rights Agreement, ROS and Royalty Opportunities are permitted to nominate a majority of the directors and designate the chairperson of our Board of Directors at subsequent annual meetings, as long as they maintain an ownership threshold in our Company of at least 40% of our then outstanding common stock (the “Ownership Threshold”). If ROS and Royalty Opportunities are unable to maintain the Ownership Threshold, the Investor Rights Agreement contemplates a reduction of nomination rights commensurate with their ownership interests.

For so long as the Ownership Threshold is met, we must obtain the approval of ROS and Royalty Opportunities to proceed with the following actions: (i) issue new securities; (ii) incur over \$250,000 of debt in a fiscal year; (iii) sell or transfer over \$250,000 of our assets or businesses or our subsidiaries in a fiscal year; (iv) acquire over \$250,000 of assets or properties in a fiscal year; (v) make capital expenditures over \$125,000 individually, or \$1,500,000 in the aggregate during a fiscal year; (vi) approve our annual budget; (vii) hire or terminate our chief executive officer; (viii) appoint or remove the chairperson of our board of directors; and (ix) make loans to, investments in, or purchase, or permit any subsidiary to purchase, any stock or other securities in another entity in excess of \$250,000 in a fiscal year. As long as the Ownership Threshold is met, we may not increase the size of our board or directors beyond seven directors without the approval of a majority of the directors nominated by ROS and Royalty Opportunities.

The Investor Rights Agreement grants Royalty Opportunities, ROS, and certain other stockholders the right to purchase from us a pro rata amount of any new securities that we may propose to issue and sell. The Investor Rights Agreement may be terminated (a) upon the mutual written agreement of all the parties, (b) upon our written notice, or the written notice of ROS or Royalty Opportunities if ROS and Royalty Opportunities’ ownership percentage of our then outstanding common stock is less than 10%, or (c) upon written notice of ROS and Royalty Opportunities.

### *Convertible Note Indenture*

During the first quarter of 2018, all of the outstanding 6.00% convertible senior unsecured notes due 2021 were converted or exchanged into shares of our common stock, and the Indenture governing such notes was discharged. On January 17, 2018, the Investors converted \$1.6 million aggregate principal amount of 6.00% convertible senior unsecured promissory notes due in 2021, which were issued effective January 17, 2017, plus accrued and unpaid interest, into 189,645 shares of our common stock. On February 14, 2018, an additional \$70.3 million aggregate principal amount of notes, plus accrued and unpaid interest, were exchanged for 10,401,309 newly-issued shares of our common stock.

### *Other Relationships with ROS and Royalty Opportunities*

Matthew Rizzo and Michael Eggenberg, both of whom are employees of OrbiMed Advisors, and Jeffrey Peters, a Venture Partner with OrbiMed Advisors, were initially elected to our board of directors on February 13, 2018 and most recently reelected on October 27, 2020, and, accordingly, OrbiMed Advisors may have the ability to affect and influence control over us. As non-employee directors, from time to time, Messrs. Rizzo, Eggenberg and Peters may receive equity awards pursuant to our compensation arrangements for non-employee directors.

## PLAN OF DISTRIBUTION

The selling stockholders and any of their respective transferees, pledgees, donees, assignees or other successors-in-interest may, from time to time, sell any or all of their respective shares of our common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions, subject to certain transfer restrictions imposed upon certain of the shares of our common stock covered by this prospectus. See “*Selling Stockholders*” on page 15 of this prospectus. Such sales may be made on one or more exchanges or in the over-the-counter market or otherwise, at prices and under terms then prevailing or at prices related to the then current market price or in negotiated transactions. The selling stockholders may use any one or more of the following methods when selling shares:

- 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 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;
- agreements between broker-dealers and the selling stockholder to sell a specified number of such shares at a stipulated price per share;
- an exchange or market distribution in accordance with the rules of the NYSE American;
- on the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- privately negotiated transactions;
- settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- through options, swaps or derivatives;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders also may sell shares under Rule 144 under the Securities Act, if available, rather than under this prospectus.

The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees or other successors-in-interest will be the selling beneficial owners for purposes of this prospectus.

In effecting sales, broker-dealers or agents engaged by the selling stockholders may arrange for other broker-dealers to participate. Broker-dealers or agents may receive commissions, discounts or concessions from the selling stockholders in amounts to be negotiated immediately prior to the sale. In connection with sales of the shares of common stock offered hereby or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of common stock offered hereby in the course of hedging in positions they assume. The selling stockholders may also sell shares of common stock offered hereby short and deliver shares of common stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also loan or pledge shares of common stock offered hereby to broker-dealers that in turn may sell such shares.

In offering the shares covered by this prospectus, the selling stockholders and any broker-dealers who execute sales for the selling stockholders may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such case, any profits realized by the selling stockholders and the compensation of any broker-dealer may be deemed to be underwriting discounts and commissions. In no event shall any broker-dealer receive fees, commissions and markups which, in the aggregate, exceed the amount permitted by applicable regulations.

In order to comply with the securities laws of certain states, if applicable, the shares must be sold in such jurisdictions only through registered or licensed brokers or dealers. In addition, in certain states, the shares 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 satisfied.

The selling stockholders have informed us that none of them has any agreement or understanding, directly or indirectly, with any person to distribute the shares of common stock. If any selling stockholder notifies us that an arrangement has been entered into with a broker-dealer for the sale of shares through a block trade, special offering or secondary distribution or a purchase by a broker or dealer, we may be required to file a prospectus supplement pursuant to the applicable rules promulgated under the Securities Act.

There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the shelf registration statement, of which this prospectus is a part.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares of our common stock in the market and to the activities of the selling stockholders and their affiliates. In addition, we will make copies of this prospectus available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We agreed to use our best efforts to keep the registration statement of which this prospectus is a part continuously effective, supplemented and amended as required by the Securities Act, in order to permit this prospectus to be usable by the selling stockholders for a period from the date the registration statement becomes effective to, and including, the date upon which no registrable securities are outstanding and constitute “restricted securities” (as defined in Rule 144 under the Securities Act). We will bear all expenses incurred in connection with the performance of our obligations under the Registration Rights Agreement and will reimburse the selling stockholders for the reasonable fees and disbursements of one firm or counsel to act as counsel for the selling stockholders in connection with this offering.

## 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 financial statements for the years ended December 31, 2019 and 2018 incorporated by reference into this prospectus and registration statement have been audited by Plante & Moran, PLLC, an independent registered public accounting firm, as set forth in their report thereon, dated March 5, 2020, appearing in our most recent Annual Report on Form 10-K, filed with the SEC on March 5, 2020, and incorporated by reference into this prospectus and registration statement, and such report is included in reliance upon the authority of such 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, 2019, filed on March 5, 2020](#);
- our [Definitive Proxy Statement for our 2020 Annual Meeting of Stockholders, filed on September 10, 2020](#);
- our [Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, filed on May 7, 2020](#);
- our [Quarterly Report on Form 10-Q for the quarter ended June 30, 2020, filed on August 3, 2020](#);
- our [Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, filed on October 29, 2020](#);
- 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 [March 25, 2020](#), [April 13, 2020](#), [August 10, 2020](#), [October 1, 2020](#), [October 6, 2020](#), [October 22, 2020](#), [October 28, 2020](#), and [November 19, 2020](#);
- 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](http://www.sec.gov). You may also obtain these documents from us, free of charge, by visiting our internet website [www.xtantmedical.com](http://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 securities 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 securities. 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](http://www.sec.gov) or on our website at [www.xtantmedical.com](http://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 provisions described above, 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.

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**XTANT MEDICAL HOLDINGS, INC.**

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**PROSPECTUS**

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**58,754,394 Shares of Common Stock**

**, 2020**

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## PART II — INFORMATION NOT REQUIRED IN PROSPECTUS

### Item 13. Other Expenses of Issuance and Distribution

The following table sets forth all expenses, other than the underwriting discounts and commissions, payable by the registrant in connection with the sale of our common stock being registered. All the amounts shown are estimates except the SEC registration fee.

|                              | <b>Amount to be<br/>paid</b> |
|------------------------------|------------------------------|
| SEC registration fee         | \$ 7,628                     |
| Accounting fees and expenses | 4,500                        |
| Legal fees and expenses      | 10,000                       |
| Miscellaneous                | 5,000                        |
| <b>Total</b>                 | <b>\$ 27,128</b>             |

### Item 14. Indemnification of Directors and Officers

#### *General Corporation Law of the State of Delaware*

Section 145(a) of the DGCL provides that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction or upon a plea of nolo contendere or its equivalent, shall not, of itself, create a presumption that the person did not act in good faith and in a manner which the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that the person's conduct was unlawful.

Section 145(b) of the DGCL states that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which the person shall have been adjudged to be liable to the corporation unless and only to the extent that the Delaware Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, the person is fairly and reasonably entitled to indemnity for such expenses as the Delaware Court of Chancery or such other court shall deem proper.

Section 145(c) of the DGCL provides that to the extent that a present or former director or officer of a corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145, or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith.

Section 145(d) of the DGCL states that any indemnification under subsections (a) and (b) of Section 145 (unless ordered by a court) shall be made by the corporation only as authorized in the specific case upon a determination that indemnification of the present or former director, officer, employee or agent is proper in the circumstances because the person has met the applicable standard of conduct set forth in subsections (a) and (b) of Section 145. Such determination shall be made with respect to a person who is a director or officer at the time of such determination (1) by a majority vote of the directors who are not parties to such action, suit or proceeding, even though less than a quorum, (2) by a committee of such directors designated by majority vote of such directors, even though less than a quorum, (3) if there are no such directors, or if such directors so direct, by independent legal counsel in a written opinion or (4) by the stockholders.

Section 145(f) of the DGCL states that the indemnification and advancement of expenses provided by, or granted pursuant to, the other subsections of Section 145 shall not be deemed exclusive of any other rights to which those seeking indemnification or advancement of expenses may be entitled under any bylaw, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in such person's official capacity and as to action in another capacity while holding such office.

Section 145(g) of the DGCL provides that a corporation shall have the power to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against any liability asserted against such person and incurred by such person in any such capacity or arising out of such person's status as such, whether or not the corporation would have the power to indemnify such person against such liability under the provisions of Section 145.

Section 145(j) of the DGCL states that the indemnification and advancement of expenses provided by, or granted pursuant to, Section 145 shall, unless otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

#### ***Certificate of Incorporation***

The Company has adopted provisions in its Certificate of Incorporation that limit director liability to the maximum extent permitted under the DGCL.

#### ***Bylaws***

The Company's Bylaws provide for the indemnification of directors and officers to the fullest extent permitted by applicable law.

#### ***Indemnification Agreements***

We have entered into agreements with our directors and executive officers that require us to indemnify them against certain liabilities that may arise by reason of their status or service as directors or executive officers to the fullest extent not prohibited by Delaware law.

#### ***Insurance Policies***

We have purchased insurance policies that purport to insure our directors and officers against certain liabilities incurred by them in the discharge of their functions as directors and officers.

The foregoing description of our Certificate of Incorporation, Bylaws, and Section 145 of the DGCL is only a summary and is qualified in its entirety by the full text of each of the foregoing.

We have been advised that it is the position of the Securities and Exchange Commission that insofar as the foregoing provisions may be invoked to disclaim liability for damages arising under the Securities Act, that such provisions are against public policy as expressed in the Securities Act and are therefore unenforceable.

### **Item 15. Recent Sales of Unregistered Securities**

#### ***Other Sales of Unregistered Securities***

During the past three years, we issued unregistered securities as outlined below. Unless otherwise specifically noted, no commissions were paid in connection with the issuances described below and each issuance was effected pursuant to Section 4(a)(2) of the Securities Act, as a transaction by an issuer not involving any public offering, and/or Regulation D promulgated thereunder. In all issuances described below, the Company took appropriate measures to restrict transfer of the securities.



- (1) Effective January 17, 2017, we issued in a private placement to Royalty Opportunities and ROS an aggregate principal amount of approximately \$1.6 million of 6.00% convertible senior unsecured promissory notes due in 2021. On January 17, 2018, Royalty Opportunities and ROS converted the aggregate principal amount of such notes, plus accrued and unpaid interest, into 189,645 shares of our common stock.
- (2) On February 14, 2018, we entered into a Securities Purchase Agreement (the “Private Placement SPA”) with Royalty Opportunities and ROS. Pursuant to the Private Placement SPA, on February 14, 2018, Royalty Opportunities and ROS purchased from the Company a total of 945,819 shares of our common stock at a price of \$7.20 per share, for aggregate proceeds of \$6,809,896. Under the Private Placement SPA, 603,687 of such shares of our common stock were issued to ROS and 342,132 of such shares of our common stock were issued to Royalty Opportunities.
- (3) On February 14, 2018, after giving effect to the reverse stock split of our common stock, \$70.3 million aggregate principal amount of our then outstanding 2017 Notes, plus accrued and unpaid interest, were exchanged for newly-issued shares of our common stock at an exchange rate of 138.8889 shares per \$1,000 principal amount of the then outstanding 2017 Notes, for an exchange price of \$7.20 per share. This resulted in the issuance of 10,401,309 shares of our common stock to the holders of the then outstanding 2017 Notes, including Royalty Opportunities and ROS.
- (4) On September 17, 2018, we and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into the Twenty-Fifth Amendment to the Amended and Restated Credit Agreement with Royalty Opportunities and ROS. As a condition to the effectiveness of this amendment, on September 17, 2018, we issued warrants to purchase an aggregate of 1.2 million shares of our common stock to Royalty Opportunities and ROS with an exercise price of \$0.01 per share and an expiration date of August 1, 2028.
- (5) On March 29, 2019, we and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into the Second A&R Credit Agreement with Royalty Opportunities and ROS. As a condition to the effectiveness of the Second A&R Credit Agreement, on April 1, 2019, we issued warrants to purchase an aggregate of 1.2 million shares of our common stock to Royalty Opportunities and ROS with an exercise price of \$0.01 per share and an expiration date of April 1, 2029.
- (6) On May 6, 2020, we and our subsidiaries, Bacterin International, Inc., Xtant Medical, Inc. and X-spine Systems, Inc., entered into the First Amendment to the Second Amended and Restated Credit Agreement with Royalty Opportunities and ROS. As a condition to the effectiveness of this amendment, on May 6, 2020, we issued warrants to purchase an aggregate of 2.4 million shares of our common stock to Royalty Opportunities and ROS, with an exercise price of \$0.01 per share and an expiration date of May 6, 2030.
- (6) After completion of the Restructuring Transactions, following approval by the stockholders, on October 1, 2020, we exchanged shares of our common stock for approximately \$40.8 million of the aggregate outstanding principal amount of loans outstanding under the Second A&R Credit Agreement as well as approximately \$21.1 million of the outstanding amount of PIK Interest (as defined in the Second A&R Credit Agreement), plus all other accrued and unpaid interest on the Exchanging Loans outstanding as of the closing date, at an exchange price of \$1.07 per share, representing the average closing price of our common stock over the 10 business days immediately prior to the parties entering into the Restructuring Agreement, and resulting in the issuance of approximately 57.8 million shares of our common stock. In addition, on October 1, 2020, we also issued 0.9 million shares of common stock in exchange for a portion of the prepayment fee payable under the Second A&R Credit Agreement in respect of the Exchanging Loans.
- (7) On November 17, 2020, Royalty Opportunities and ROS exercised warrants representing an aggregate of 4.8 million shares of our common stock. We received aggregate proceeds of \$48,000 from this warrant exercise. We did not pay any fees or commissions in connection with this warrant exercise.

## Item 16. Exhibits and Financial Statement Schedules

### (a) Exhibits

| <b>Exhibit No.</b> | <b>Description</b>   |
|--------------------|--|
| 2.1                | <a href="#"><u>Stock Purchase Agreement dated July 27, 2015 among Bacterin International Holdings, Inc., X-spine Systems, Inc. and the sellers named therein (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on July 28, 2015 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>  |
| 3.1                | <a href="#"><u>Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on February 13, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>   |
| 3.2                | <a href="#"><u>Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 31, 2019 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>  |
| 3.3                | <a href="#"><u>Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 1, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>   |
| 3.4                | <a href="#"><u>Second Amended and Restated Bylaws of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on February 16, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>  |
| 4.1                | <a href="#"><u>Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934 (filed as Exhibit 4.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2019 (File No. 001-34951) and incorporated by reference herein)</u></a>   |
| 4.2                | <a href="#"><u>Form of Common Stock Certificate (filed as Exhibit 4.2 to the Registrant's Registration Statement on Form S-1 filed with the SEC on December 21, 2015 (SEC File No. 333-208677) and incorporated by reference herein)</u></a>   |
| 4.3                | <a href="#"><u>Form of Warrant Certificate for Warrants underlying Units (filed as Exhibit 4.1 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2016 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>  |
| 4.4                | <a href="#"><u>Form of Warrant Agreement (filed as Exhibit 4.2 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2016 (SEC File No. 001-34951) and incorporated by referenced herein)</u></a>   |
| 4.5                | <a href="#"><u>Registration Rights Agreement (for Common Stock underlying the Indenture Notes) dated January 17, 2017 among Xtant Medical Holdings, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP (filed as Exhibit 10.9 to the Registrant's Current Report on Form 8-K filed with the SEC on January 20, 2017 (SEC File No. 001-34951) and incorporated by reference herein)</u></a> |
| 4.6                | <a href="#"><u>Registration Rights Agreement (for Common Stock underlying the PIK Notes) dated January 17, 2017 among Xtant Medical Holdings, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP (filed as Exhibit 10.13 to the Registrant's Current Report on Form 8-K filed with the SEC on January 20, 2017 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>      |

| Exhibit No. | Description  |
|-------------|--|
| 4.7         | <a href="#">Registration Rights Agreement (for Common Stock issued upon the exchange of the Notes and pursuant to the Private Placement) dated as of February 14, 2018 among Xtant Medical Holdings, Inc., OrbiMed Royalty Opportunities II, LP, ROS Acquisition Offshore LP, Telemetry Securities, L.L.C., Bruce Fund, Inc., Park West Investors Master Fund, Limited, and Park West Partners International, Limited (filed as Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed with the SEC on February 16, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a> |
| 4.8         | <a href="#">Registration Rights Agreement dated October 1, 2020 among Xtant Medical Holdings, Inc., OrbiMed Royalty Opportunities II, LP, and ROS Acquisition Offshore LP (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on October 1, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 4.9         | <a href="#">Investor Rights Agreement dated February 14, 2018 among Xtant Medical Holdings, Inc., OrbiMed Royalty Opportunities II, LP, ROS Acquisition Offshore LP, Park West Partners International, Limited and Park West Investors Master Fund, Limited (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on February 16, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 5.1*        | <a href="#">Opinion of Fox Rothschild LLP</a>  |
| 10.1        | <a href="#">Xtant Medical Holdings, Inc. Amended and Restated 2018 Equity Incentive Plan (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 28, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.2        | <a href="#">Form of Employee Stock Option Award Agreement for use with the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.3        | <a href="#">Form of Employee Restricted Stock Unit Award Agreement for use with the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |
| 10.4        | <a href="#">Form of Non-Employee Director Restricted Stock Unit Award Agreement for use with the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2019 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |
| 10.5        | <a href="#">Amended and Restated Xtant Medical Equity Incentive Plan (filed as Exhibit 10.8 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2015 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.6        | <a href="#">Form of Stock Option Agreement under Amended and Restated Xtant Medical Equity Incentive Plan (filed as Exhibit 10.23 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2012 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.7        | <a href="#">Form of Indemnification Agreement for Directors and Officers (filed as Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2017 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.8        | <a href="#">Employment Agreement dated as of October 7, 2019 between Xtant Medical Holdings, Inc. and Sean E. Browne (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 7, 2019 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |

| Exhibit No. | Description  |
|-------------|--|
| 10.9        | <a href="#">Employment Agreement effective as of July 9, 2018 between Xtant Medical Holdings, Inc. and Kevin D. Brandt (filed as Exhibit 10.18 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |
| 10.10       | <a href="#">Amended and Restated Employment Agreement effective as of August 8, 2019 between Xtant Medical Holdings, Inc. and Greg Jensen (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2019 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.11       | <a href="#">Restructuring and Exchange Agreement dated as of January 11, 2018 among Xtant Medical Holdings, Inc., OrbiMed Royalty Opportunities II, LP, ROS Acquisition Offshore LP, Bruce Fund, Inc., Park West Partners International, Limited, Park West Investors Master Fund, Limited, and Telemetry Securities, L.L.C. (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on January 12, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a> |
| 10.12       | <a href="#">Securities Purchase Agreement dated as of February 14, 2018 among Xtant Medical Holdings, Inc., OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP. (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on February 16, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.13       | <a href="#">Second Amended and Restated Credit Agreement dated March 29, 2019 among Xtant Medical Holdings, Inc., Bacterin International, Inc., Xtant Medical, Inc., X-spine Systems, Inc., OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP (filed as Exhibit 10.47 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |
| 10.14       | <a href="#">First Amendment to Second Amended and Restated Credit Agreement effective as of April 1, 2020 among Xtant Medical Holdings, Inc., Bacterin International, Inc., Xtant Medical, Inc., X-spine Systems, Inc., OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</a>                       |
| 10.15       | <a href="#">Second Amendment to Second Amended and Restated Credit Agreement effective as of October 1, 2020 among Xtant Medical Holdings, Inc., Bacterin International, Inc., Xtant Medical, Inc., X-spine Systems, Inc., OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 1, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</a>                               |
| 10.16       | <a href="#">Distribution Agreement dated January 23, 2014 between X-spine Systems, Inc. and Zimmer Spine, Inc., as amended (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2015 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 10.17       | <a href="#">Restructuring and Exchange Agreement, dated August 7, 2020, by and among ROS Acquisition Offshore LP, OrbiMed Royalty Opportunities II, LP, Bruce Fund, Inc. (filed as Exhibit 10.1 to Form 8-K filed on July 10, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |
| 16.1        | <a href="#">Letter from EKS&amp;H LLLP to the SEC dated October 8, 2018 (filed as Exhibit 16.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 9, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</a>   |
| 21.1        | <a href="#">Subsidiaries of the Registrant (filed as Exhibit 21.1 to the Registrant's Post-Effective Amendment No. 1 to Form S-1 Registration Statement filed with the SEC on August 25, 2015 (SEC File No. 333-203492) and incorporated by reference herein)</a>  |

| Exhibit No. | Description   |
|-------------|---|
| 23.1*       | <a href="#">Consent of Independent Registered Accounting Firm, Plante &amp; Moran, PLLC</a> |
| 23.2*       | <a href="#">Consent of Fox Rothschild LLP (included in Exhibit 5.1)</a>                     |
| 24.1*       | <a href="#">Power of Attorney (included on signature page)</a>                              |

\* Filed herewith

**(b) Financial Statement Schedules**

Schedules have been omitted because the information required to be set forth therein is not applicable or is shown in the financial statements or notes thereto.

**Item 17. Undertakings**

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) (§230.424(b) of this chapter) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*provided, however*, that paragraphs (a)(1)(i), (ii) and (iii) shall not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of this offering.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to section 13(a) or section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Belgrade, State of Montana, on December 18, 2020.

### XTANT MEDICAL HOLDINGS, INC.

By: /s/ Sean E. Browne

Name: Sean E. Browne

Title: President and Chief Executive Officer

### POWER OF ATTORNEY

We, the undersigned officers and directors of Xtant Medical Holdings, Inc., a Delaware corporation, hereby constitute and appoint Sean E. Browne and Greg Jensen, and each of them individually, as the true and lawful agent and attorney-in-fact of the undersigned with full power and authority in said agent and attorney-in-fact to sign for the undersigned and in their respective names as an officer/director of the Company, any and all amendments (including post-effective amendments) to this registration statement on Form S-1 (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act) and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, and with full power of substitution, hereby ratifying and confirming all that said attorney-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

| <u>Signature</u>                                  | <u>Capacity</u>  | <u>Date</u>       |
|---|--|-------------------|
| <u>/s/ Sean E. Browne</u><br>Sean E. Browne       | President and Chief Executive Officer and Director<br>(Principal Executive Officer)                                      | December 18, 2020 |
| <u>/s/ Greg Jensen</u><br>Greg Jensen             | Vice President, Finance and Chief Financial Officer<br>(Principal Financial Officer and Principal<br>Accounting Officer) | December 18, 2020 |
| <u>/s/ John K. Bakewell</u><br>John K. Bakewell   | Director   | December 18, 2020 |
| <u>/s/ Michael Eggenberg</u><br>Michael Eggenberg | Director   | December 18, 2020 |
| <u>/s/ Robert McNamara</u><br>Robert McNamara     | Director   | December 18, 2020 |
| <u>/s/ Jeffrey Peters</u><br>Jeffrey Peters       | Director   | December 18, 2020 |
| <u>/s/ Matthew Rizzo</u><br>Matthew Rizzo         | Director   | December 18, 2020 |

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www.foxrothschild.com

December 18, 2020

Xtant Medical Holdings, Inc.  
664 Cruiser Lane  
Belgrade, Montana 59714

Re: Registration Statement on Form S-1

Ladies and Gentlemen:

We have acted as counsel to Xtant Medical Holdings, Inc., a Delaware corporation (the "Company"), in connection with the Company's registration of the resale, from time to time, of an aggregate of 58,754,394 shares (the "Shares") of its common stock, par value \$0.000001 per share (the "Common Stock"), by the selling stockholders listed therein under "Selling Stockholders" pursuant to a Registration Statement on Form S-1 (as amended or supplemented, the "Registration Statement") under the Securities Act of 1933, as amended (the "Act"), as originally filed by the Company with the Securities and Exchange Commission (the "SEC") on December 18, 2020. The Shares may be sold from time to time as set forth in the Registration Statement, any amendment thereto, the prospectus contained therein and any prospectus supplement and pursuant to Rule 415 under the Act.

In connection with this opinion, we have examined the Registration Statement, the Restructuring and Exchange Agreement, dated as of August 7, 2020, by and among the Company, OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP, the Current Report on Form 8-K as filed by the Company with the SEC on October 7, 2020, the Company's Amended and Restated Certificate of Incorporation, as amended, the Company's Second Amended and Restated Bylaws, as currently in effect, resolutions adopted by the Board of Directors of the Company pertaining to the issuance of the Shares, the written consent of the majority of the Company's stockholders pertaining to the issuance of the Shares and such other documents, records, certificates, memoranda and instruments as we have deemed necessary as a basis for this opinion. In rendering this opinion, we have assumed the genuineness and authenticity of all signatures on original documents, including signatures made and/or transmitted using electronic signature technology (e.g., via DocuSign or similar electronic signature technology), that any such signed electronic record shall be valid and as effective to bind the party so signing as a paper copy bearing such party's handwritten signature; the legal capacity of all natural persons; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as certified or photocopies; the authenticity of the originals of such latter documents; the accuracy and completeness of all documents and records reviewed by us; the accuracy, completeness and authenticity of certificates issued by any governmental official, office or agency and the absence of change in the information contained therein from the effective date of any such certificate; and the due authorization, execution and delivery of all documents where authorization, execution and delivery are prerequisites to the effectiveness of such documents.

On the basis of the foregoing, and in reliance thereon and subject to the qualifications herein stated, we are of the opinion that the Shares have been duly authorized and are validly issued, fully paid and non-assessable.

Our opinion herein is expressed solely with respect to the General Corporation Law of the State of Delaware (including the statutory provisions, all applicable provisions of the Delaware Constitution and reported judicial decisions interpreting the foregoing) and is based on these laws as in effect on the date hereof. We express no opinion herein as to any other statutes, rules or regulations. We express no opinion herein as to whether the laws of any jurisdiction are applicable to the subject matter hereof. We are not rendering any opinion as to compliance with any federal or other state law, rule or regulation relating to securities, or to the sale or issuance thereof.

This opinion letter has been prepared for your use in connection with the Company's registration of the resale of the Shares. This opinion is expressed as of the date hereof, and we disclaim any undertaking to advise you of any subsequent changes in the facts stated or assumed herein or of any subsequent changes in applicable law.

We consent to the filing of this opinion letter as an exhibit to the Registration Statement and to the reference to this firm under the caption "Legal Matters" in the prospectus contained therein. In giving this consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the SEC thereunder.

Very truly yours,

/s/ Fox Rothschild LLP

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**CONSENT OF INDEPENDENT REGISTERED ACCOUNTING FIRM**

We consent to the incorporation by reference in this Registration Statement on Form S-1 of our report dated March 5, 2020, with respect to the consolidated financial statements of Xtant Medical Holdings, Inc. included in its Annual Report on Form 10-K as of and for the years ended December 31, 2019 and 2018. We also consent to the reference to us under the heading “Experts” in such Registration Statement.

*/s/ PLANTE & MORAN, PLLC*

Denver, Colorado  
December 18, 2020

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