

Xtant Medical Holdings, Inc.
Form S-1
August 26, 2016

As filed with the Securities and Exchange Commission August 26, 2016

Registration Statement No. 333-

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

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

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 No.)

**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)

John Gandolfo
Chief Financial 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)

Copies to:

Travis Leach
Ballard Spahr LLP
One East Washington Street, Suite 2300
Phoenix, Arizona 85004
(602) 798-5444

Approximate date of commencement of proposed sale to the public: As soon as practicable after this registration statement becomes effective.

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.

Edgar Filing: Xtant Medical Holdings, Inc. - Form S-1

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

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller Reporting Company

TABLE OF CONTENTS**CALCULATION OF REGISTRATION FEE**

Title of securities to be registered	Proposed maximum aggregate offering price ⁽¹⁾	Amount of registration fee
Units, each consisting of one share of common stock, par value \$0.000001 per share (Common Stock) and one share of a warrant (Warrant) to purchase one share of Common Stock (Units)	\$10,000,000	\$ 1,007
Non-transferable Rights to purchase Units ⁽²⁾		
Common Stock, par value \$0.000001 per share included as part of the Units ⁽³⁾	Included with Units above	
Warrants included as part of the Units ⁽³⁾	Included with Units above	
Common Stock issuable upon exercise of the Warrants included in the Units ⁽⁴⁾	\$ 5,000,000	\$ 504
Pre-Funded Warrants in lieu of Common Stock included in Units ⁽³⁾	Included with Units Above	
Common Stock issuable upon exercise of Pre-Funded Warrants ⁽³⁾⁽⁴⁾	Included with Units Above	
Total	\$ 15,000,000	\$ 1,511

(1) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457(o) of the Securities Act of 1933 (the Securities Act).

(2) Non-transferable Rights to subscribe for Units are being issued without consideration.

(3) Pursuant to Rule 457(i) of and existing interpretations under the Securities Act, no separate registration fee is required for the Common Stock and Warrants because the Common Stock and Warrants are being registered at the same time as the Units.

(4) Pursuant to Rule 416 under the Securities Act, the shares being registered hereunder include such indeterminate number of shares as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions.

The registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

TABLE OF CONTENTS

The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission becomes effective. This prospectus is not an offer to sell these securities, and we are not soliciting offers to buy these securities in any state where the offer or sale of these securities is not permitted.

SUBJECT TO COMPLETION, DATED AUGUST 26, 2016

PRELIMINARY PROSPECTUS

XTANT MEDICAL HOLDINGS, INC.

We are distributing to holders of our Common Stock, at no charge, non-transferable subscription rights to purchase units. Each unit, which we refer to as a Unit, consists of one share of Common Stock and of a Warrant representing the right to purchase one share of Common Stock, which we refer to as the Warrants. We refer to the offering that is the subject of this prospectus as the Rights Offering.

In the Rights Offering, you will receive two subscription rights for each share of Common Stock, at 5:00 PM Eastern Time, on , 2016, the record date of the Rights Offering, or the Record Date. The Common Stock and the Warrants comprising the Units will separate upon the effectiveness of the exercise of the rights and will be issued as separate securities, and the Units will not trade as a separate security. The subscription rights will not be tradable.

Each subscription right will entitle you to purchase one Unit, which we refer to as the Basic Subscription Right, at a subscription price per Unit to be determined, which we refer to as the Subscription Price. The exact Subscription Price per Unit will be determined by our board of directors prior to the effectiveness of the registration statement of which this prospectus is a part. The Warrants entitle the holder to purchase one share of Common Stock at an exercise price of \$ per share, from the date of issuance through its expiration on . If you exercise your Basic Subscription Rights in full, and other stockholders do not, you will be entitled to an over-subscription privilege to purchase a portion of the unsubscribed Units at the Subscription Price, subject to proration, which we refer to as the Over-Subscription Privilege. Each subscription right consists of a Basic Subscription Right and an Over-Subscription Privilege, which we refer to as the Subscription Right.

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of our outstanding Common Stock, such investors may elect to receive in the Rights Offering, in lieu of shares of Common Stock, certain pre-funded warrants (which we refer to as the Pre-Funded Warrants) to purchase the same number of shares of Common Stock. If you do not wish to exceed the ownership threshold, you may elect to receive a Pre-Funded Warrant in lieu of any share of Common Stock underlying the Units for which you have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of Common Stock outstanding following the consummation of the Rights Offering. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company.

This prospectus also relates to the offering of the shares of Common Stock issuable upon exercise of these Pre-Funded Warrants.

The Subscription Rights will expire if they are not exercised by 5:00 PM Eastern Time, on _____, 2016. We may extend the Rights Offering for additional periods in our sole discretion. Once made, all exercises of Subscription Rights are irrevocable.

The Rights Offering is being conducted on a best-efforts basis. There is no minimum amount of proceeds necessary in order for us to close the Rights Offering. While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$ _____ million in the Rights Offering, subject to potential proration.

We have engaged Maxim Group LLC to act as dealer-manager in the Rights Offering.

Investing in our securities involves a high degree of risk. See the section entitled *Risk Factors* beginning on page 26 of this prospectus. You should carefully consider these risk factors, as well as the information contained in this prospectus, before you invest.

Corporate Stock Transfer, Inc. will serve as the Subscription Agent for the Rights Offering. The Subscription Agent will hold the funds we receive from subscribers until we complete, abandon or terminate the Rights Offering. If you want to participate in this Rights Offering and you are the record holder of your shares, we recommend that you submit your subscription documents to the Subscription Agent well before the deadline. If you want to participate in this Rights Offering and you hold shares through your broker, dealer, bank, or other nominee, you should promptly contact your broker, dealer, bank, or other nominee and submit your subscription documents in accordance with the instructions and within the time period provided by your broker, dealer, bank, or other nominee. For a more detailed discussion, see *The Rights Offering* *The Subscription Rights*.

Our board of directors reserves the right to terminate the Rights Offering for any reason any time before the completion of the Rights Offering. If we terminate the Rights Offering, all subscription payments received will be returned as soon as practicable, without interest or penalty.

Our Common Stock is listed on the NYSE MKT under the symbol XTNT. On August 23, 2016, the last reported sale price of our Common Stock was \$1.35. We will seek to have the Warrants trade on the over-the-counter market, or the OTCBB promptly after the expiration of the Subscription Rights. If we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. There is no guarantee that the Warrants will be accepted for trading on the OTCBB or, in the future, accepted for listing on NYSE MKT. The Subscription Rights are non-transferrable and will not be listed for trading on NYSE MKT or any other stock exchange or market. You are urged to obtain a current price quote for our Common Stock before exercising your Subscription Rights.

	Per Unit	Total ⁽²⁾
Subscription price	\$	\$
Dealer-Manager fees and expenses ⁽¹⁾	\$	\$
Proceeds to us, before expenses	\$	\$

In connection with this Rights Offering, we have agreed to pay to the dealer-manager a cash fee equal to 7% of the gross proceeds received by us directly from exercises of Subscription Rights. We have also provided to the dealer-manager a non-accountable expense allowance of \$75,000 for expenses incurred in connection with the Rights Offering. We advanced \$30,000 of this \$75,000 allowance to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us any portion of the advance not used for actual out-of-pocket expenses. See *Plan of Distribution*.

(2) Assumes the Rights Offering is fully subscribed, but excludes proceeds from the exercise of Warrants included within the Units.

Our board of directors is making no recommendation regarding your exercise of the Subscription Rights. You should carefully consider whether to exercise your Subscription Rights before the expiration date. You may not revoke or revise any exercises of Subscription Rights once made unless we terminate the Rights Offering.

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.

Dealer-Manager

Maxim Group LLC

The date of this Prospectus is _____, 2016

TABLE OF CONTENTS

TABLE OF CONTENTS

	Page
<u>Questions and Answers Relating to the Rights Offering</u>	<u>1</u>
<u>Prospectus Summary</u>	<u>8</u>
<u>Summary of the Rights Offering</u>	<u>22</u>
<u>Risk Factors</u>	<u>26</u>
<u>Cautionary Note Regarding Forward-Looking Statements</u>	<u>32</u>
<u>Use of Proceeds</u>	<u>34</u>
<u>Capitalization</u>	<u>35</u>
<u>Dilution</u>	<u>36</u>
<u>Market Price of and Dividends on Our Common Stock</u>	<u>37</u>
<u>The Rights Offering</u>	<u>38</u>
<u>Material U.S. Federal Income Tax Consequences</u>	<u>46</u>
<u>Description of Securities</u>	<u>53</u>
<u>Plan of Distribution</u>	<u>58</u>
<u>Legal Matters</u>	<u>59</u>
<u>Experts</u>	<u>59</u>
<u>Incorporation of Certain Information by Reference</u>	<u>59</u>
<u>Where You Can Find More Information</u>	<u>60</u>

You should read this prospectus, the documents incorporated by reference into this prospectus, and any prospectus supplement or free writing prospectus that we may authorize for use in connection with this offering, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections of this prospectus entitled Incorporation of Certain Information by Reference and Where You Can Find More Information. These documents contain important information that you should consider when making your investment decision.

We are only responsible for the information contained in, or incorporated by reference into, this prospectus, in any prospectus supplement or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We have not authorized anyone to provide any information other than that contained in this prospectus, in any prospectus supplement or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We are offering to sell, and seeking offers to buy, securities only in jurisdictions where such offers and sales are permitted. The information in this prospectus, in any prospectus supplement or any free writing prospectus is accurate only as of its date, regardless of its time of delivery or of any sale of securities. Our business, financial condition, results of operations and prospects may have changed since that date.

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, including those described in Risk Factors. These and other factors could cause our future performance to differ materially from our assumptions and estimates. See Cautionary Note Regarding Forward-Looking Statements.

TABLE OF CONTENTS

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.

Except as otherwise indicated herein or as the context otherwise requires, references in this prospectus to Xtant, the Company, we, us, our and similar references refer to Xtant Medical Holdings, Inc. and its subsidiaries.

ii

TABLE OF CONTENTS

QUESTIONS AND ANSWERS RELATING TO THE RIGHTS OFFERING

The following are examples of what we anticipate will be common questions about the Rights Offering. The answers are based on selected information included elsewhere in this prospectus. The following questions and answers do not contain all of the information that may be important to you and may not address all of the questions that you may have about the Rights Offering. This prospectus and the documents incorporated by reference into this prospectus contain more detailed descriptions of the terms and conditions of the Rights Offering and provide additional information about us and our business, including potential risks related to the Rights Offering, the Units offered hereby, and our business. We urge you to read this entire prospectus and the documents incorporated by reference into this prospectus.

Why are we conducting the Rights Offering?

We are conducting the Rights Offering to raise additional capital:

to provide equity capital to support the continuing execution of the Company's growth strategy, specifically to increase surgical instruments and fixation and biologics inventory, and for general corporate purposes, including research and development, business development and operational purposes.

What is the Rights Offering?

We are distributing, at no charge, to record holders of our Common Stock, non-transferable Subscription Rights to purchase Units at a price per Unit of \$1.00. The Subscription Rights will not be tradable. Each Unit consists of one share of Common Stock and of a Warrant representing the right to purchase one share of Common Stock at an exercise price of \$1.00 per share. Upon the effectiveness of the exercise of the Subscription Rights, the Common Stock and Warrants will immediately separate and will be issued as separate securities. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights. You will receive two Subscription Rights for each share of Common Stock that you owned as of 5:00 PM Eastern Time, on the Record Date. Each Subscription Right entitles the record holder to a Basic Subscription Right and an Over-Subscription Privilege.

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of our outstanding Common Stock, such investors may elect to receive in the Rights Offering, in lieu of shares of Common Stock, certain pre-funded warrants (which we refer to as the Pre-Funded Warrants) to purchase the same number of shares of Common Stock. If you do not wish to exceed the ownership threshold, you may elect to receive a Pre-Funded Warrant in lieu of any share of Common Stock underlying the Units for which you have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of Common Stock outstanding following the consummation of the Rights Offering. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be \$1.00 (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company.

What are the Basic Subscription Rights?

For each whole share you owned as of the Record Date, you will receive two Basic Subscription Rights, each which gives you the opportunity to purchase one share of our Common Stock and to receive of a Warrant to purchase one additional share of our Common Stock for a price of \$ per Unit. For example, if you owned 50 shares of Common Stock as of the Record Date, you will receive 100 Subscription Rights and will have the right to purchase 100 shares of our Common Stock and 100 Warrants to purchase one additional share of our Common Stock for \$ per whole Unit (or a total payment of \$). You may exercise all or a portion of your Basic Subscription Rights or you may choose not to exercise any Basic Subscription Rights at all.

If you are a record holder, the number of shares you may purchase pursuant to your Basic Subscription Rights is indicated on the enclosed Subscription Rights Statement. If you hold your shares in the name of a broker, dealer, bank, or other nominee who uses the services of the Depository Trust Company, or DTC, you will not

TABLE OF CONTENTS

receive a Subscription Rights Statement. Instead, DTC will issue two Subscription Rights to your nominee record holder for each share of our Common Stock that you own as of the Record Date. If you are not contacted by your nominee, you should contact your nominee as soon as possible.

What is the Over-Subscription Privilege?

If you exercise your Basic Subscription Rights in full, you may also choose to exercise your Over-Subscription Privilege to purchase a portion of any Units that the other record holders do not purchase through the exercise of their Basic Subscription Rights. You should indicate on your Subscription Rights Statement, or the form provided by your nominee if your shares are held in the name of a nominee, how many additional Units you would like to purchase pursuant to your Over-Subscription Privilege.

If sufficient Units are available, we will seek to honor your Over-Subscription request in full. If Over-Subscription requests exceed the number of Units available, however, we will allocate the available Units pro-rata among the record holders exercising the Over-Subscription Privilege in proportion to the number of shares of our Common Stock each of those record holders owned on the Record Date, relative to the number of shares owned on the Record Date by all record holders exercising the Over-Subscription Privilege. If this pro-rata allocation results in any record holders receiving a greater number of Units than the record holder subscribed for pursuant to the exercise of the Over-Subscription Privilege, then such record holder will be allocated only that number of Units for which the record holder oversubscribed, and the remaining Units will be allocated among all other record holders exercising the Over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all Units have been allocated. See *The Rights Offering Limitation on the Purchase of Units* for a description of certain limitations on purchase.

To properly exercise your Over-Subscription Privilege, you must deliver to the Subscription Agent the subscription payment related to your Over-Subscription Privilege before the Rights Offering expires. See *The Rights Offering The Subscription Rights Over-Subscription Privilege*. To the extent you properly exercise your Over-Subscription Privilege for a number of Units that exceeds the number of unsubscribed Units available to you, any excess subscription payments will be returned to you as soon as practicable after the expiration of the Rights Offering, without interest or penalty.

Corporate Stock Transfer, Inc., our Subscription Agent for the Rights Offering, will determine the Over-Subscription allocation based on the formula described above.

What are the terms of the Warrants?

Each Warrant entitles the holder to purchase one share of Common Stock at an exercise price of \$ per share, from the date of issuance through its expiration on . The Warrants will be exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis. After the one-year anniversary of issuance, we may redeem the Warrants for \$0.01 per Warrant if the volume weighted average price of our Common Stock is above \$ per share, for each of 10 consecutive trading days. Subject to certain exceptions, a holder may not exercise any portion of the Warrant to the extent that the holder would beneficially own more than 4.99% of the outstanding Common Stock after exercise.

May I sell my Warrants?

We will seek to have the Warrants quoted on the OTCBB promptly after the expiration of the Subscription Rights. If we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. We cannot assure you that we will be able to list the Warrant on the OTCBB or NYSE MKT, that there will be a market to sell the Warrants, or the price at which you will be able to sell your Warrants. In addition, following the closing of the Rights Offering, the Warrants may not be immediately tradable until the securities exchange to which we may apply makes a decision with respect to the listing applications in respect of the Warrants. As a result, even if the listing application with respect to the Warrants is successful, the Warrants may not be listed immediately following the closing of the Rights Offering.

TABLE OF CONTENTS

What are the terms of the Pre-Funded Warrants?

The Pre-Funded Warrants will only be issued to certain investors whose subscriptions for Units in the Rights Offering may result in the purchaser beneficially owning more than 4.99% of our outstanding Common Stock following the consummation of the Rights Offering, and who elect to receive Pre-Funded Warrants in lieu of shares of Common Stock underlying the Units for which the investors have subscribed. You will not be eligible to elect to receive Pre-Funded Warrants except to the extent that your beneficial ownership could exceed 4.99% of the shares of Common Stock outstanding following the consummation of the Rights Offering.

Each Pre-Funded Warrant entitles the holder to purchase one share of Common Stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration 12 years after the date of issuance. The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis in accordance with the terms of the Pre-Funded Warrants. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market. The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company.

Will fractional shares be issued upon exercise of Subscription Rights or upon the exercise of Warrants?

No. We will not issue fractional shares of Common Stock in the Rights Offering. Rights holders will only be entitled to purchase a number of Units representing a whole number of shares of Common Stock, rounded down to the nearest whole number of Units a holder would otherwise be entitled to purchase. Any excess subscription payments received by the Subscription Agent will be returned as soon as practicable after expiration of the Rights Offering, without interest or penalty. Similarly, no fractional shares of Common Stock will be issued in connection with the exercise of a Warrant. If, upon exercise of a Warrant, the holder thereof would be entitled to receive a fractional share of Common Stock, upon exercise, the holder will only be entitled to receive a whole number of shares of Common Stock, rounded down to the nearest whole number.

What effect will the Rights Offering have on our outstanding Common Stock?

On August 23, 2016, 12,193,970 shares of our Common Stock were outstanding. Based on the foregoing, and assuming no other transactions by us involving our Common Stock prior to the expiration of the Rights Offering, if the Rights Offering is fully subscribed, approximately shares of our Common Stock will be issued and outstanding and Warrants to purchase approximately additional shares of our Common Stock will be outstanding (excluding the currently outstanding warrants). The exact number of shares and Warrants that we will issue in this Rights Offering will depend on the number of Units that are subscribed for in the Rights Offering.

How is the Subscription Price determined?

In determining the Subscription Price, our board of directors is expected to consider, among other things, the following factors:

the current and historical trading prices of our Common Stock;
the price at which stockholders might be willing to participate in the Rights Offering;
the value of the Warrant being issued as a component of the Unit;
our need for additional capital and liquidity;
the cost of capital from other sources; and

comparable precedent transactions, including the percentage of shares offered, the terms of the subscription rights being offered, the subscription price and the discount that the subscription price represented to the immediately prevailing closing prices for those offerings.

In conjunction with the review of these factors, our board of directors will also review our history and prospects, including our past and present earnings and cash requirements, our prospects for the future, the outlook for our industry and our current financial condition. Our board of directors believes that the

TABLE OF CONTENTS

Subscription Price should be designed to provide an incentive to our current stockholders to participate in the Rights Offering and exercise their Basic Subscription Right and their Over-Subscription Privilege.

The Subscription Price does not necessarily bear any relationship to any established criteria for value. You should not consider the Subscription Price as an indication of actual value of the Company or our Common Stock. We cannot assure you that the market price of our Common Stock will not decline during or after the Rights Offering. You should obtain a current price quote for our Common Stock before exercising your Subscription Rights and make your own assessment of our business and financial condition, our prospects for the future, and the terms of this Rights Offering. Once made, all exercises of Subscription Rights are irrevocable.

Am I required to exercise all of the Basic Subscription Rights I receive in the Rights Offering?

No. You may exercise any number of your Basic Subscription Rights, or you may choose not to exercise any Basic Subscription Rights. If you do not exercise any Basic Subscription Rights, the number of shares of our Common Stock you own will not change. However, if you choose to not exercise your Basic Subscription Rights in full, your proportionate ownership interest in the Company will decrease. If you do not exercise your Basic Subscription Rights in full, you will not be entitled to exercise your Over-Subscription Privilege.

How soon must I act to exercise my Subscription Rights?

If you received a Subscription Rights Statement and elect to exercise any or all of your Subscription Rights, the Subscription Agent must receive your completed and signed Subscription Rights Statement and payment for both your Basic Subscription Rights and any Over-Subscription Privilege you elect to exercise, including final clearance of any uncertified check, before the Rights Offering expires on _____, 2016, at 5:00 PM Eastern Time. If you hold your shares in the name of a broker, dealer, custodian bank, or other nominee, your nominee may establish a deadline before the expiration of the Rights Offering by which you must provide it with your instructions to exercise your Subscription Rights, along with the required subscription payment.

May I transfer my Subscription Rights?

No. The Subscription Rights may be exercised only by the stockholders to whom they are distributed, and they may not be sold, transferred, assigned or given away to anyone else, other than by operation of law. As a result, a Subscription Rights Statement may be completed only by the stockholder who receives the statement. The Subscription Rights will not be listed for trading on any stock exchange or market.

Will our directors and executive officers participate in the Rights Offering?

To the extent they hold Common Stock as of the Record Date, our directors and executive officers will be entitled to participate in the Rights Offering on the same terms and conditions applicable to other Rights holders. While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$ _____ in the Rights Offering, subject to potential proration.

Has the board of directors made a recommendation to stockholders regarding the Rights Offering?

No. Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. Stockholders who exercise Subscription Rights will incur investment risk on new money invested. We cannot predict the price at which our shares of Common Stock will trade after the Rights Offering. On August 23, 2016, the closing price of our Common Stock was \$1.35 per share. The market price for our Common Stock may be above the Subscription Price or may be below the Subscription Price. If you exercise your Subscription Rights, you may not be able to sell the underlying shares of our Common Stock or Warrants in the future at the same price or a higher price. You should make your decision based on your assessment of our business and financial condition, our prospects for the future, the terms of the Rights Offering and the information contained in this prospectus. See Risk Factors for discussion of some of the risks involved in investing in our securities.

How do I exercise my Subscription Rights?

If you are a stockholder of record (meaning you hold your shares of our Common Stock in your name and not through a broker, dealer, bank, or other nominee) and you wish to participate in the Rights Offering, you must

TABLE OF CONTENTS

deliver a properly completed and signed Subscription Rights Statement, together with payment of the Subscription Price for both your Basic Subscription Rights and any Over-Subscription Privilege you elect to exercise, to the Subscription Agent before 5:00 PM Eastern Time, on _____, 2016. If you are exercising your Subscription Rights through your broker, dealer, bank, or other nominee, you should promptly contact your broker, dealer, bank, or other nominee and submit your subscription documents and payment for the Units subscribed for in accordance with the instructions and within the time period provided by your broker, dealer, bank or other nominee.

What if my shares are held in street name ?

If you hold your shares of our Common Stock in the name of a broker, dealer, bank, or other nominee, then your broker, dealer, bank, or other nominee is the record holder of the shares you own. The record holder must exercise the Subscription Rights on your behalf. Therefore, you will need to have your record holder act for you.

If you wish to participate in this Rights Offering and purchase Units, please promptly contact the record holder of your shares. We will ask the record holder of your shares, who may be your broker, dealer, bank, or other nominee, to notify you of this Rights Offering.

What form of payment is required?

You must timely pay the full Subscription Price for the full number of Units you wish to acquire pursuant to the exercise of Subscription Rights by delivering to the Subscription Agent a:

cashier's check drawn on a U.S. bank; or
wire transfer.

If you send a payment that is insufficient to purchase the number of Units you requested, or if the number of Units you requested is not specified in the forms, the payment received will be applied to exercise your Subscription Rights to the fullest extent possible based on the amount of the payment received.

When will I receive my new shares of Common Stock and Warrants?

The Subscription Agent will arrange for the issuance of the Common Stock and Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. All shares and Warrants that you purchase in the Rights Offering will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares. If you hold your shares in the name of a broker, dealer, bank, or other nominee, DTC will credit your account with your nominee with the securities you purchase in the Rights Offering.

When will I receive my Pre-Funded Warrants?

If you elect to receive any Pre-Funded Warrants, the Subscription Agent will arrange for the issuance of the Pre-Funded Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. All Pre-Funded Warrants will be issued in physical form.

After I send in my payment and Subscription Rights Statement to the Subscription Agent, may I cancel my exercise of Subscription Rights?

No. Exercises of Subscription Rights are irrevocable unless the Rights Offering is terminated, even if you later learn information that you consider to be unfavorable to the exercise of your Subscription Rights. You should not exercise your Subscription Rights unless you are certain that you wish to purchase Units at the Subscription Price.

How much will the Company receive from the Rights Offering?

Assuming that all Units are sold in the Rights Offering, we estimate that the net proceeds from the Rights Offering will be approximately \$, based a Subscription Price of \$ per Unit, after deducting fees and expenses payable to the dealer-manager, and after deducting other expenses payable by us and excluding any proceeds received upon exercise of any Warrants issued in the Rights Offering.

TABLE OF CONTENTS

Are there risks in exercising my Subscription Rights?

Yes. The exercise of your Subscription Rights involves risks. Exercising your Subscription Rights involves the purchase of additional shares of our Common Stock and Warrants to purchase Common Stock and you should consider this investment as carefully as you would consider any other investment. We cannot assure you that the market price of our Common Stock will exceed the Subscription Price, nor can we assure you that the market price of our Common Stock will not further decline during or after the Rights Offering. We also cannot assure you that you will be able to sell shares of our Common Stock or Warrants purchased in the Rights Offering at a price equal to or greater than the Subscription Price. In addition, you should carefully consider the risks described under the heading Risk Factors for discussion of some of the risks involved in investing in our securities.

Can the board of directors terminate or extend the Rights Offering?

Yes. Our board of directors may decide to terminate the Rights Offering at any time and for any reason before the expiration of the Rights Offering. We also have the right to extend the Rights Offering for additional periods in our sole discretion. We do not presently intend to extend the Rights Offering. We will notify stockholders if the Rights Offering is terminated or extended by issuing a press release.

If the Rights Offering is not completed or is terminated, will my subscription payment be refunded to me?

Yes. The Subscription Agent will hold all funds it receives in a segregated bank account until completion of the Rights Offering. If we do not complete the Rights Offering, all subscription payments received by the Subscription Agent will be returned as soon as practicable after the termination or expiration of the Rights Offering, without interest or penalty. If you own shares in street name, it may take longer for you to receive your subscription payment because the Subscription Agent will return payments through the record holder of your shares.

How do I exercise my Rights if I live outside the United States?

The Subscription Agent will hold Subscription Rights Statements for stockholders having addresses outside the United States. To exercise Subscription Rights, foreign stockholders must notify the Subscription Agent and timely follow other procedures described in the section entitled The Rights Offering Foreign Stockholders on page 44.

What fees or charges apply if I purchase shares in the Rights Offering?

We are not charging any fee or sales commission to issue Subscription Rights to you or to issue shares or Warrants to you if you exercise your Subscription Rights. If you exercise your Subscription Rights through a broker, dealer, custodian bank, or other nominee, you are responsible for paying any fees your broker, dealer, bank, or other nominee may charge you.

What are the U.S. federal income tax consequences of exercising my Subscription Rights?

For U.S. federal income tax purposes, we do not believe you should recognize income or loss in connection with the receipt or exercise of Subscription Rights in the Rights Offering. You should consult your tax advisor as to the tax consequences of the Rights Offering in light of your particular circumstances. For a more detailed discussion, see Material U.S. Federal Income Tax Consequences on page 46.

To whom should I send my forms and payment?

If your shares are held in the name of a broker, dealer, bank, or other nominee, then you should send your subscription documents and subscription payment to that broker, dealer, bank, or other nominee. If you are the record holder, then you should send your Subscription Rights Statement and payment of your subscription price to the Subscription Agent hand delivery, first class mail or courier service to:

By Mail or Hand or Overnight Courier:
Corporate Stock Transfer, Inc.
3200 Cherry Creek Drive South, Suite 430
Denver, Colorado 80209

TABLE OF CONTENTS

You or, if applicable, your nominee are solely responsible for completing delivery to the Subscription Agent of your subscription documents, Subscription Rights Statement and payment. You should allow sufficient time for delivery of your subscription materials to the Subscription Agent before the expiration of the Rights Offering at 5:00 PM Eastern Time on _____, 2016.

Whom should I contact if I have other questions?

If you have other questions or need assistance, please contact the dealer-manager for the Rights Offering:

**Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745**

Who is the dealer-manager?

Maxim Group LLC will act as dealer-manager for the Rights Offering. Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will use its best efforts to solicit the exercise of Subscription Rights. We have agreed to pay the dealer-manager certain fees for acting as dealer-manager and a non-accountable expense allowance in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of Common Stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of Common Stock or Warrants. See Plan of Distribution on page 58 for a discussion of the fees and expenses to be paid to the dealer-manager in connection with this Rights Offering.

TABLE OF CONTENTS

PROSPECTUS SUMMARY

This summary highlights certain information about us, this offering and selected information contained in the 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 in the prospectus, including Risk Factors and the financial statements and related notes.

About Xtant Medical Holdings, Inc.

We operate through our subsidiaries Bacterin International, Inc. (Bacterin) and X-spine Systems, Inc. (X-spine). Through Bacterin, we develop, manufacture and market biologics products to domestic and international markets. Our bone graft products are used in a variety of applications including enhancing fusion in spine surgery, relief of back pain through facet joint stabilization, promotion of bone growth in foot and ankle surgery, promotion of skull healing following neurosurgery and subchondral bone repair in knee and other joint surgeries. Our acellular dermis scaffolds are utilized in wound care and plastic and reconstructive procedures. Bacterin also develops custom surgical instruments for use with our allografts, and we produce and distribute OsteoSelect® DBM putty, an osteoinductive product used by surgeons as a bone void filler in the extremities and pelvis. X-spine is a global developer, manufacturer and marketer of implants and instruments for surgery of the spine and sacroiliac joint. X-spine's product emphasis is the minimally invasive approach to the treatment of degenerative spine disorders. X-spine's global strategy is to advance minimally invasive technologies for the treatment of degenerative spinal disorders, while supporting established spinal fusion markets.

We are a Delaware corporation. Our principal executive offices are located at 664 Cruiser Lane, Belgrade, Montana 59714. Our telephone number is (406) 388-0480 and our website address is www.xtantmedical.com. Information contained in, or that can be accessed through, our website is not part of this prospectus.

The following description of our business should be read in conjunction with the section titled Business in Item 1, Part I of our Annual Report on Form 10-K for the year ended December 31, 2015, which is incorporated by reference into this prospectus.

Overview of Our Business

Xtant believes the following competitive strengths will be key drivers of future growth of Xtant:

Portfolio of Proprietary Technologies: Xtant has developed a comprehensive portfolio of products that address a broad array of spinal pathologies, anatomies and surgical approaches in the complex spine and minimally invasive surgery (MIS) markets. To protect company innovative technologies and techniques, Xtant maintains and continues to grow its intellectual property portfolio, with over 100 issued patents globally and over 40 patent applications pending.

Customer Focus: Responding quickly and efficiently to the needs of patients, surgeons and hospitals is central to corporate culture and critical to success. Our supply chain and customer service teams make sure that the right product and instrumentation is in the right place at the right time through vertically integrated processes, we are able to meet the changing needs of our customers.

Multi-channel Distribution Network: Xtant has built a hybrid sales and distribution function calling on Orthopedic Surgeons, Neuro Surgeons, their staff and the hospital administrators that support them. Approximately 300 field agents and distributors in the United States represent some or all of Xtant's products. The distribution channel consists of multiple sub-channels including direct sales, consignment agents, reseller distributors, and private label distributors and technology licensees.

Our Offices

Our headquarter office and manufacturing facility are located at 664 Cruiser Lane, Belgrade, Montana 59714. Our telephone number is (406) 388-0480 and our fax number is (406) 388-1354. We also have two other facilities on the Montana campus, located at 600 Cruiser Lane, Belgrade, Montana 59714, and at 732 Cruiser Lane, Belgrade, Montana 59714, a Colorado office located at 363 Centennial Parkway, Louisville, Colorado 80112, and one Ohio facility at 452 Alexandersville Road, Miamisburg, Ohio 45342. All our properties are leased.

TABLE OF CONTENTS

Our History

We began operations in 1998 as a spinout of the Center for Biofilm Engineering at Montana State University, or the CBE, and we eventually incorporated as Bacterin, Inc. in the state of Montana in January 2000. In March 2004, Bacterin, Inc.'s stockholders entered into a share exchange agreement with a company called Oil & Gas Seekers, Inc., a Nevada corporation, which subsequently changed its name to Bacterin International, Inc., to become a publicly-traded corporation. As a result of this transaction, the stockholders of Bacterin, Inc., the Montana corporation, became stockholders of Bacterin International, Inc., the Nevada corporation, and Bacterin, Inc., the Montana corporation, became a wholly owned subsidiary of Bacterin International, Inc., the Nevada corporation. In May 2005, we merged Bacterin, Inc., the Montana corporation, up and into Bacterin International, Inc., the Nevada corporation.

We began as a biomaterials testing laboratory and have systematically expanded our strategic vision towards the development of Bacterin-labeled products. Our revenues were initially derived from testing services and milestone payments from collaborative product development agreements with various medical manufacturers. Today we generate most of our revenue from biologics products we manufacture.

On June 30, 2010, Bacterin International, Inc. merged with and into a wholly-owned Nevada subsidiary of Bacterin International Holdings, Inc. f/k/a K-Kitz Incorporated, a Delaware corporation, and as a result, Bacterin International, Inc. became a wholly owned subsidiary of the Company.

Before the reverse merger, Bacterin International Holdings, Inc. was known as K-Kitz, Incorporated, with a trading symbol of KKTZ.OB. On June 29, 2010, K-Kitz Incorporated changed its corporate name to Bacterin International Holdings, Inc. which name change became effective for trading purposes on July 1, 2010, following the reverse merger transaction. Effective July 21, 2010, our trading symbol was changed from KKTZ.OB to BIHI.OB. On March 7, 2011, our common stock began trading on the NYSE Amex under the ticker symbol BONE.

On July 31, 2015, we acquired all of the outstanding capital stock of X-Spine for approximately \$60 million in cash, repayment of approximately \$13 million of X-spine debt, and approximately 4.24 million shares of Xtant common stock. X-spine is engaged in the development, manufacturing and sale of medical devices for use in orthopedic spinal surgeries. As a result of this transaction, X-Spine became a wholly owned subsidiary of the Company.

Concurrently with the acquisition, we completed an offering of \$65.0 million aggregate principal amount of the notes in a private offering to qualified institutional buyers, as defined in Rule 144A under the Securities Act. Certain private investment funds for which OrbiMed Advisors LLC (OrbiMed), one of our existing stockholders, serves as the investment manager (the OrbiMed purchasers) purchased \$52.0 million aggregate principal amount of the notes directly from us in the offering. The investment banking firm acting as initial purchaser in the offering (the initial purchaser) purchased the remaining \$13.0 million aggregate principal amount of the notes. We granted the initial purchaser a 30-day option to purchase up to an additional \$9.75 million aggregate principal amount of the notes from us. On August 10, 2015, the initial purchaser exercised its option with respect to an additional \$3.0 million aggregate principal amount of the notes. Additionally, concurrently with the acquisition, we borrowed an additional \$18.0 million under an amended and restated credit agreement with ROS Acquisition Offshore LP (ROS).

At the close of business on July 31, 2015, we changed our corporate name to Xtant Medical Holdings, Inc. On August 6, 2015 Xtant formed a new wholly owned subsidiary, Xtant Medical, Inc., a Delaware corporation to facilitate the integration of Bacterin and X-spine. On October 15, 2015, our common stock began trading on NYSE MKT under the ticker symbol XTNT. X-spine is engaged in the development, manufacturing and sale of medical devices for use in

orthopedic spinal surgeries. Xtant, Bacterin and X-spine are jointly referred to herein as the Company .

Industry and Market Overview

The orthopedic biomaterials market consists of materials that are organic, inorganic or synthetic in nature. These materials are implanted or applied in or near the indicated bone to facilitate healing, encourage bone tissue augmentation, compensate in areas where bone tissue is depleted and restore structure to allow for repair. Orthopedic biomaterials are capable of producing specific biological action or regenerative responses

TABLE OF CONTENTS

that are beyond what is observed in normal healing. These materials are often used as substitutes to autograft materials, which are taken from a harvest site in the patient to patch or repair the wounded or unhealthy site. Bone is a biologically active tissue and may or may not regenerate depending on the condition of the patient. The damage may be significant enough that a scaffold may be necessary to help regenerate the surgical site.

Fixation is often instrumental in allowing the body to heal and regenerate tissue. It provides the constructive support necessary for reestablishing stability, by immobilizing the regenerative site, and relieving stress. Fixation can also help hold the biomaterial in place in order to achieve a better outcome. Examples of fixation products can include, but is not limited to, plates, screws, pins, rods, spacers, and staples, and may be made from various metals and polymer materials.

Products and Services

Our biomaterial products include OsteoSponge®, OsteoSponge® SC, OsteoSelect® DBM putty, OsteoSelect Plus DBM putty, OsteoWrap®, BacFast® HD, OsteoSTX®, hMatrix® and our new line of 3Demin® products, as well as other allografts described below:

OsteoSponge is a form of demineralized bone matrix made from 100% human bone. Derived from trabecular (cancellous) bone, OsteoSponge provides a natural scaffold for cellular in-growth and exposes bone-forming proteins to the healing environment. The malleable properties of OsteoSponge enable it to conform to, and fill, most defects. Upon compressing the allograft, OsteoSponge springs back to completely fill the void. Its unique mechanical and biological properties make OsteoSponge an ideal bone graft for use in various orthopedic practices including spine, neurology, cranial/maxillofacial, trauma, plastic/reconstruction and general procedures where new bone growth is needed.

OsteoSponge SC is a form of OsteoSponge designed to fill bony defects in the subchondral region of joints. We have received permission from the Food and Drug Administration (FDA), which is a federal agency of the United States Department of Health and Human Services, to market this product as a subchondral bone void filler, and are currently marketing it as such.

OsteoSelect DBM Putty is engineered with the surgeon in mind. With outstanding handling characteristics, OsteoSelect can be easily molded into any shape and compressed into bony voids. Bacterin has validated a low-dose, low-temperature gamma sterilization process to provide maximum osteoinductive potential while still affording device level sterility. Every production batch of OsteoSelect is tested for osteoinductive bone growth characteristics allowing us to make that unique marketing claim.

Combining the exceptional cohesive characteristics of OsteoSelect DBM Putty with demineralized cortical chunks, OsteoSelect PLUS delivers differentiated handling properties and insures patient safety through validated, terminal sterilization. Each lot of OsteoSelect PLUS DBM is tested for osteoinductivity *in vivo* prior to being released. OsteoSelect PLUS is indicated as a bone void filler and bone graft substitute in the pelvis, extremities, and posterolateral spine.

OsteoWrap is 100% human cortical bone demineralized through a proprietary process to make the graft flexible while maintaining allograft integrity. This product has various applications in orthopedic, neurological, trauma, oral/maxillofacial and reconstructive procedures. OsteoWrap can wrap around non-union fractures to assist with fusion, can act as a biologic plate or can be used in conjunction with a hardware plate system. Additionally, this product provides the surgeon with superior handling characteristics as the allograft can be easily sized using surgical scissors or a scalpel, and will withhold sutures or staples for fixation.

BacFast HD facet stabilization dowel is designed with a focus on osteoconductivity and osteoinductive potential. BacFast HD is hyper-demineralized to expose the growth factors and BMPs inherent to cortical bone. With the benefits of HD technology and increased collagen surface area, BacFast® HD also provides the graft with

osteoinductive properties without compromising the structural integrity of the graft. These characteristics, coupled with an osteoconductive design through increased surface contact and locking edges to prevent migration, BacFast® HD is engineered with a focus on fusion as well as facet stabilization.

10

TABLE OF CONTENTS

OsteoSTX are demineralized cortical sticks processed from human allograft bone. Utilizing our patented demineralization technology, the grafts are flexible and feature osteoinductive properties. The nature of demineralized cortical bone provides all the necessary elements for bone regeneration. OsteoSTX are designed for posterolateral spine surgery applications ranging from one-level to multi-level fusions, including scoliosis procedures. This is a new addition to Bacterin's biologic products portfolio launched in March 2014.

hMatrix dermal scaffold is an extension of Bacterin's core biologics technology. hMatrix is an acellular matrix made from donated human dermal tissue that is used to replace a patient's damaged tissue. hMatrix provides a natural collagen tissue scaffold that promotes cellular ingrowth, tissue vascularization and regeneration, and reabsorbs into the patient's dermal tissue for a biocompatible, natural repair.

3Demin is a family of allografts that maximizes osteoconductivity and the osteoinductive potential of human bone. They consist of 100% demineralized cortical bone with excellent, malleable handling characteristics, and are distributed as a sterile allograft. Bacterin's 3Demin products are easily hydrated with any biocompatible liquid, making them an ideal option for various bone grafting applications. They are most commonly used in spinal fusion procedures.

All of the Company's biologics are terminally sterilized and packaged to enhance the safety of our grafts for our physician customers and their patients.

We also process and distribute (i) sports allografts which are processed specifically for anterior and posterior cruciate ligament repairs, anterior cruciate ligament reconstruction and meniscal repair, (ii) milled spinal allografts which are comprised of cortical bone milled to desired shapes and dimensions, and (iii) traditional allografts for multi-disciplinary applications including orthopedics, neurology, podiatry, oral/maxillofacial, genitourinary and plastic/reconstructive.

The Company's related biologic products are described in multiple physician-initiated studies that continue to prove expanded indications for their use.

In our fixation portfolio, there are numerous product families that are used to treat a variety of spinal and sacroiliac conditions, including trauma, degeneration, deformity and tumor, with an emphasis on Minimally Invasive Surgery (MIS). Some of our key product lines include:

The Axle® Interspinous Fusion System is a fully modular interspinous device that is matched to the patient's individual anatomy and is available in multiple implantable configurations.

The Silex® Sacroiliac Joint Fusion System is a sacroiliac fixation system that actively compresses across the SI joint. Sacroiliac dysfunction is increasingly recognized as a frequent contributor to chronic low back pain.

The Xpress™ Minimally Invasive Pedicle Screw System combines minimally invasive functionality to the most common lumbar fixation procedures – pedicle screw fixation.

The Certex™ Spinal Fixation System consists of screws, hooks, rods, and cross connectors. Various sizes of these implants are available so that adaptations can be made to take into account pathology and individual patient anatomy. It is intended to promote fusion of the subaxial cervical spine and cervico-thoracic junction (C3 – T3 inclusive).

The Butrex® Anterior Lumbar Buttress Plating System utilizes the patented Resilient Locking Arm Technology to prevent screw back out, while providing repeatable and reliable results. The low profile design, and two point fixation ensures minimal disruption to the local anatomy and high cantilever expulsion resistance. The Butrex System also features an all-in-one drill guide with a plate retaining feature to allow for greater control during plate placement, and to protect adjacent structures.

Calix® is a family of PEEK interbody spacers and precision instruments for both Cervical and Thoracolumbar applications. Calix PC is a frictional titanium plasma-coated PEEK implant that provides additional biomechanical performance and end-plate visualization.

TABLE OF CONTENTS

Spider® Cervical Plating System. The Spider Cervical Plating System consists of a simple, single step locking mechanism. Three forms of locking feedback provide confidence in the Spider System construct and performance. Self-drilling screws preserve cancellous bone for secure screw purchase. If drilling is desired, instruments offer optional drill guides and drill bits. A full sweep of 15° angulation can be achieved with Spider System variable screws.

The Zyfix™ Facet Fusion System is a minimally invasive facet fusion system featuring a hollow fenestrated titanium compression screw for bone graft introduction. It is intended for bilateral, transfacet fixation of the facet joint in order to provide stability for fusion.

The Fixcet® Spinal Facet Screw System is a percutaneous facet screw system offering dual-compression thread and single-thread screws. It is intended for posterior fixation to the lumbar spine (L1 – S1 inclusive). It enables a bilateral, transfacet fixation of the facet joint in order to provide stability for fusion.

The Fortex® Pedicle Screw System consists of titanium alloy bone screws, rods, cross-connectors and associated instruments. The system is indicated for attachment to the pedicles of the thoracic, lumbar, and sacral spine.

The X90® Pedicle Screw System combines unique rotary locking technology and maximum biomechanical performance allowing for simple rod locking without a separate locking cap or set screw. Through its unified design, the X90 Pedicle Screw System is designed to avoid the problems of cross threading, head splay, and cap loosening, endemic to cap type pedicle screw systems.

The Irix-A™ Lumbar Integrated Fusion System consists of an integrated titanium ring, surrounded by an outer PEEK ring and three screws. It is intended for spinal fusion procedures at one or two contiguous levels of the lumbosacral spine (L2 – S1 inclusive) in skeletally mature patients for the treatment of degenerative disc disease.

The Irix-C™ Cervical Integrated Fusion System consists of an integrated titanium ring surrounded by an outer PEEK ring and two screws. It is intended for spinal fusion procedures at one level (C3 – T1 inclusive) in skeletally mature patients for the treatment of degenerative disc disease.

The Axle-X™ Interspinous Fusion System is an internal fixation device for spinal surgery in the non-cervical spine (T1 – S1 inclusive). It is a minimally invasive, modular interspinous fusion system with angled spikes that allows for adequate L5 – S1 engagement and other variations in patient anatomy. The Axle-X Interspinous Fusion System is designed to provide spinal stability for lumbar fusion procedures, including the treatment of degenerative disc disease, spinal tumors and trauma.

The X-PORT™ tissue-sparing instrumentation system was designed to maximize surgical access and visualization while minimizing tissue disruption. An ideal partner to the X-spine Fortex pedicle screw system, the radiolucent X-PORT retractor component is integrated with a siderail mounted flexible arm for accurate localization and stability. The X-PORT system includes integral tissue-sparing instrumentation to allow for compression, distraction and rod placement while maintaining anatomic visualization through the retractor component.

Technology and Intellectual Property

Patents, trademarks and other proprietary rights are very important to our business. We also rely upon trade secrets, manufacturing know-how, continuing technological innovations and licensing opportunities to maintain and improve our competitive position. We review third-party proprietary rights, including patents and patent applications, as available, in an effort to develop an effective intellectual property strategy, avoid infringement of third-party proprietary rights, identify licensing opportunities and monitor the intellectual property owned by others.

Patents

Our biomaterial patent efforts are focused on the development of innovative and novel, engineered tissue implants or constructs which employ acellular tissue and processes, and enhanced demineralized bone matrix products. On November 5, 2013, the United States (U.S.) Patent and Trademark Office issued U.S. Patent

TABLE OF CONTENTS

No. 8,574,825 entitled Process for Demineralization of Bone Matrix with Preservation of Natural Growth Factors. The issued claims in the patent are for a method to produce a demineralized cancellous bone matrix, such as Bacterin's OsteoSponge® product line. Bacterin has a pending divisional application in the United States to pursue protection of other aspects of its bone demineralization technology and is pursuing related applications in Canada, Europe and Korea. We have other provisional applications pending in the United States and other countries that relate to aspects of the technology used in many of our products. Our policy is to file patent applications in the United States and other countries when we believe it is commercially advantageous to do so. We do not consider our business to be materially dependent upon any individual patent.

We also held patents related to our medical device coatings business. At the end of 2014, the Company made the strategic decision to exit the medical device coatings business and sold the coating equipment and the coating intellectual property in 2015.

The fixation product portfolio includes over 50 issued patents globally and over 30 patent applications pending. In addition to current product offerings, Xtant continues to invest in the research and development necessary to design, develop and commercialize new surgical solutions for unmet clinical needs.

We believe our patent filings and patent position will facilitate growth and enhance our proprietary core competencies. We expect that additional patent applications will be filed and prosecuted as inventions are discovered, technological improvements and processes are developed and specific applications are identified. There can be no assurance that we will be able to obtain final approval of any patents.

Trademarks

We have registered, and continue to seek registration, of trademarks and continuously monitor and aggressively pursue users of names and marks that potentially infringe upon our registered trademarks. We currently own the following registered trademarks under the Bacterin name: OsteoSponge®, OsteoWrap®, OsteoLock®, BacFast®, OsteoSelect®, Elutia®, OsteoSTX®, hMatrix®, 3Demin®, BACTERINSE®, and Circle of Life®. Under the X-spine name, we own the following registered trademarks: SILEX®, X-SPINE®, IRIX®, CAPLESS®, CERTEX®, CALIX®, H-GRAFT®, SPIDER, X90®, HYDRAGRAFT®, BUTREX®, FORTEX®, AXLE®, FIXCET®, Capless® and X-spine's square design logo.

Trade Secrets

To safeguard our proprietary knowledge and technology, we rely upon trade secret protection and non-disclosure/confidentiality agreements with employees, consultants and third party collaboration partners with access to our confidential information. There can be no assurance, however, that these measures will adequately protect against the unauthorized disclosure or use of confidential information, or that third parties will not be able to independently develop similar technology. Additionally, there can be no assurance that any agreements concerning confidentiality and non-disclosure will not be breached, or if breached, that we will have an adequate remedy to protect us against losses. Although we believe our proprietary technology has value, because of rapid technological changes in the medical industry, we also believe that proprietary protection is of less significance than factors such as the intrinsic knowledge and experience of our management, advisory board, consultants and personnel and their ability to identify unmet market needs and to create, invent, develop and market innovative and differentiated products.

Donor Procurement

We have agreements with multiple recovery agencies and we continue to expand our network for access to donor tissue in anticipation of increased demand. We expect to be able to continue to build our network for donor tissue as our processing capabilities and sales increase.

Relationship with Zimmer Spine, Inc.

In January 2014, X-spine entered into a license agreement with Zimmer, under which Zimmer granted to X-spine a royalty-bearing, non-exclusive license under certain Zimmer patents to make, have made, use, practice, offer for sale, sell, export and import certain spinal screw, anchor and rod implants. X-spine is required to pay a royalty in the mid-single digits on gross sales of products covered by the in-licensed patents.

TABLE OF CONTENTS

X-spine's license agreement with Zimmer continues so long as there is an enforceable claim in the in-licensed patents. Either X-spine or Zimmer may terminate the agreement for any material breach by the other party that is not cured within a specified time period or in the event of the other party's insolvency.

Also, in January 2014, X-spine entered into a distribution agreement with Zimmer, under which X-spine granted Zimmer a co-exclusive right to distribute certain X-spine products worldwide. X-spine is entitled to receive a royalty in the low-single digits on net sales of products. X-spine also obtained a non-exclusive, perpetual, worldwide license under certain Zimmer patents to distribute certain of X-spine's products. In consideration for the rights granted to X-spine under the agreement, X-spine will be required to pay a royalty on net sales of certain products in the range of 4.0% to 6.5% depending on the product.

Sales and Marketing

We promote our product in the United States through a hybrid distribution network including direct employees, sales agents and independent distributors.

Our international footprint includes distribution partners in Canada, Mexico, South America, Europe, Middle East, Australia, Korea, and Taiwan. Xtant continues to evaluate new, global market opportunities and expects to expand the number of international markets served.

Growth Strategy

In an effort to capitalize on our core markets, as well as new market opportunities, we have diversified our supply of donor tissue, expanded our processing capabilities and developed a hybrid sales force. We have focused our United States sales activities on Orthopedic Surgeons and Neuro Surgeons performing spine procedures, and are working to cover call points with strategic distribution relationships.

We are pursuing a high-level, national effort to present our products as a value proposition to hospital systems and other purchasing organizations. To this end, we have entered into agreements with Banner Hospitals, Dignity Health, OhioHealth, Franciscan Health System, the Hospital for Special Surgery, Beaumont Health, Providence, Sutter, Community Health Services, Sharp Healthcare, Franciscan Alliance, Pinnacle Health Systems, Proliance Surgeons, Baptist Health South Florida, MedAssets, Novation, Premier, ROi, Health Trust Purchasing Group, Scripps and Bon Secours among others. These agreements are paving the way for our sales representatives to call on additional physicians, as the hospital process has already been approved.

Competition

There are various public and private organizations that offer both, fixation and orthobiologics to their customers. With the growing market, and ongoing pressures to expand and make product portfolios more robust, we expect several new products and new companies will emerge over the coming years. We consider our direct competitors to be orthopedic companies that offer both spinal fixation and biologics, such as NuVasive, RTI Surgical, SeaSpine, Medtronic, OrthoFix, Stryker, Alphatec, Zimmer Biomet, DePuy/Synthes, Medtronic, K2 Medical, and Globus Medical. We also compete with some hardware companies that do not currently market a biologic, such as LDR Holding Company, and tissue banks that do not specialize in spinal fixation materials, such as AlloSource, Lifenet Health, and MTF.

Government Regulation

We are registered with the FDA as a manufacturer of human cellular and tissue products (HCT/Ps) as well as medical devices, and we are an accredited member of the American Association of Tissue Banks in good standing. We meet all licensing requirements for the distribution of HCT/Ps in states with licensing requirements, including Florida, California, Delaware, Illinois, Louisiana, Maryland, Oregon, and New York. Our industry is highly regulated and we cannot predict the impact of future regulations on either us or our customers.

Our fixation products and instrumentation systems are regulated as medical devices and therefore are subject to extensive regulation by the FDA, as well as by other domestic and international regulatory bodies. These regulations govern multiple activities that Xtant and suppliers, licensors and partners perform and will continue to perform. These regulated activities include product design and development, testing,

14

TABLE OF CONTENTS

manufacturing, labeling, storage, safety, premarket clearance, advertising and promotion, product marketing, sales and distribution, post-market surveillance and post-market adverse event reporting. All products currently marketed by Xtant are regulated as HCT/Ps or have received 510(k) clearances.

Human Tissue

Human tissue products have been regulated by the FDA since 1993. In May 2005, three new comprehensive regulations went into effect that address manufacturing activities associated with HCT/Ps. The first requires that companies that produce and distribute HCT/Ps register with the FDA. The second provides criteria that must be met for donors to be eligible to donate tissues and is referred to as the Donor Eligibility rule. The third rule governs the processing and distribution of the tissues and is often referred to as the Current Good Tissue Practices rule. Together, they are designed to ensure that sound, high quality practices are followed to reduce the risk of tissue contamination and communicable disease transmission to recipients. Several of our products including OsteoSponge and OsteoWrap are regulated as HCT/Ps as determined by the Tissue Reference Group and regulated under Section 361 of the Public Health Service Act (PHSA) and 21 CFR Part 1271.

Medical Devices

Our medical devices require the clearance of the FDA prior to sale within the United States. The FDA process requires a premarket notification, or a 510(k) submission, to the FDA to demonstrate that the medical device is safe and effective and is substantially equivalent to a legally marketed device that is not subject to premarket approval. Applicants must compare the device to one or more similar devices that are commercially available in the United States (known as the predicate device), and make and support a claim of substantial equivalency to such predicate device. Support for such claims must include descriptive data and, when necessary, performance data. In some cases, data from clinical trials must also be submitted in support of a 510(k) submission. The FDA must then issue an order finding substantial equivalency before the devices may be commercially distributed in the United States. The Center for Devices and Radiological Health Division of the FDA governs HCT/Ps that are regulated as medical devices, including our OsteoSelect DBM putty.

Our medical devices require the clearance of the FDA prior to sale within the United States. The FDA process requires a premarket notification, or a 510(k) submission, to the FDA to demonstrate that the medical device is safe and effective and is substantially equivalent to another legally marketed device that was on the market prior to 1976 (known as a Pre-amendments device) or was cleared after 1976 as a 510(k) device. The device(s) to which a substantial equivalence comparison is made is called a predicate device. A company cannot claim substantial equivalence to a device approved by FDA under the lengthier, more extensive Premarket Approval process (PMA). The standard for approving a PMA device is to establish reasonable assurance of safety and effectiveness in an independent and absolute sense, i.e. not by comparing the applicant's device to another device as with a 510(k). The PMA process is typically required for devices that are deemed to pose the greatest risk, such as life-sustaining, life-supporting or implantable devices. The 510(k) process is reserved for low to moderate risk devices. Under the 510(k) process applicants must demonstrate that their device is safe and effective in a comparative sense by comparing itself to a predicate 510(k) device that has been on the market safely and effectively for some time. To establish substantial equivalence to a predicate device, an applicant must demonstrate that it has the 1) same intended use, 2) the same technological characteristics, and 3) if the technological characteristics are different, the applicant must show those differences do not raise different questions of safety and effectiveness. Making this case to FDA requires an extensive submission with a lot of written, telephonic and sometimes face-to-face dialogue with FDA. The applicant must provide data to demonstrate that their device does not diminish safety and effectiveness in comparison to the predicate device. The type of data necessary for a clearance differs for each type of device and the claims the company seeks to make and FDA's expectations for data are often unclear and do change. Companies submit

performance data, e.g., bench testing, in vitro and in vivo data, biocompatibility, animal data, etc. The quality and quantity of data needed is usually discussed and negotiated with FDA. In some cases, data from human clinical trials must also be submitted in support of a 510(k) submission.

The discussion of what data are needed is sometimes conducted in a formal process called the Pre-Submission process whereby companies meet with FDA to discuss the data needed for clearance. If the FDA finds the

15

TABLE OF CONTENTS

applicant's device is substantially equivalent to the predicate device it will send a letter to the applicant stating that fact. This allows the applicant's device to be commercially distributed in the United States. The Center for Devices and Radiological Health division of the FDA governs the clearance of conventional medical devices such as our spinal hardware as well as some of the HCT/Ps that are also regulated as medical devices, such as our OsteoSelect DBM putty.

Another procedure for obtaining marketing authorization for a medical device is the de novo classification procedure. If the FDA agrees that the device is substantially equivalent to a predicate device currently on the market, it will grant 510(k) clearance to commercially market the device. If the FDA determines that the device is not substantially equivalent to a previously cleared device, the device is automatically designated as a Class III device. The device sponsor must then fulfill more rigorous PMA requirements, or can request a risk-based classification determination for the device in accordance with the de novo process, which is a route to market for novel medical devices that are low to moderate risk and are not substantially equivalent to a predicate device. A company files for a de novo approval when it does not have a predicate to which it can claim substantial equivalence. Once a de novo application is reviewed and approved, it results in the device having a Class II status and future devices from the company or a competitor may use the company de novo-approved device as a 510(k) predicate. A de novo approval is reserved for Class II moderate risk devices and a company must show that special controls can be created which subsequent applicants can follow to obtain a 510(k) clearance. The advantage of the de novo approval is that it requires less data than a PMA. The disadvantage is that it may require more data than a 510(k) and most often will include human clinical data. FDA is increasingly moving devices with slightly different proposed indication statements or different technological features off the 510(k) path and on to the de novo path resulting in more time and expense for the company.

The process of obtaining regulatory clearances or approvals to market a medical device can be costly and time-consuming, and we may not be able to obtain these clearances or approvals on a timely basis, if at all. Products that are approved through a PMA application generally need FDA approval before they can be modified. Similarly, some modifications made to products cleared through a 510(k) may require a new 510(k) or a PMA.

In the future, Xtant may decide to strategically commercialize products in the United States that would require a PMA, but there are no plans to do so at the present time. Clinical trials are almost always required to support a PMA.

Ongoing FDA Regulation

After a device is placed on the market, numerous FDA and other regulatory requirements continue to apply. These include: establishment registration and device listing with the FDA; the current Good Manufacturing Regulations and Quality Systems Regulations (together the QSR), which requires manufacturers to follow stringent design, testing, process control, documentation and other quality assurance procedures; labeling regulations, which prohibit the promotion of products for unapproved, i.e. off-label, uses and impose other restrictions on labeling; Medical Device Reporting regulations, which require that manufacturers report to the FDA if their device may have caused or contributed to a death or serious injury or malfunctioned in a way that would likely cause or contribute to a death or serious injury if it were to recur; corrections and removal reporting regulations, which require that manufacturers report to the FDA field corrections and product recalls or removals if undertaken to reduce a risk to health posed by the device or to remedy a violation of the Federal Food, Drug, and Cosmetic Act (the FDCA) that may present a risk to health; and requirements to conduct post-market surveillance studies to establish continued safety data.

The FDA enforces these requirements by inspection and market surveillance. Failure to comply with applicable regulatory requirements may result in enforcement action by the FDA, which may include one or more of the following sanctions:

untitled letters or warning letters;
fines, injunctions and civil penalties;
mandatory recall or seizure of our products;

TABLE OF CONTENTS

administrative detention or banning of our products;
operating restrictions, partial suspension or total shutdown of production;
refusing our request for 510(k) clearance or PMA of new product versions;
revocation of 510(k) clearance or PMAs previously granted; and
criminal prosecution and penalties.

International Regulation

Many foreign countries have regulatory bodies and restrictions similar to the FDA. International sales are subject to foreign government regulation, the requirements of which vary substantially from country to country. The time required to obtain approval in a foreign country or to obtain a CE Certificate of Conformity may be longer or shorter than that required for FDA approval and the related requirements may differ. Some third-world countries accept CE Certificates of Conformity or FDA clearance or approval as part of applications of approval for marketing of medical devices in their territory. Other countries, including Brazil, Canada, Australia and Japan, require separate regulatory filings.

Healthcare Fraud and Abuse

Healthcare fraud and abuse laws apply to Xtant's business when a customer submits a claim for an item or service that is reimbursed under Medicare, Medicaid or most other federally-funded healthcare programs. The Federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, items or services for which payment may be made, in whole or in part, under federal health care programs, such as by Medicare or Medicaid. The concerns that the Anti-Kickback Statute addresses are multiple, but primary among them are, first, that the federal government pays/reimburses health care providers for the true acquisition cost of goods and services provided to patients served by government programs. The government does not want, for example, health care providers obtaining manufacturer discounts which are not disclosed to the government on cost report forms submitted for reimbursement to the government. The government wants to be the beneficiary of such discounts. Second, for that reason, the government wants transparency in the billing process which discloses such discounts to the government. Third, the government does not want purchasing, prescription or referral decisions for medical devices biased by economics unrelated to the best choices for a patient.

The Federal Anti-Kickback Statute is subject to evolving interpretations and has been applied by government enforcement officials to a number of common business arrangements in the medical device industry. Remunerative relationships with physicians in which manufacturers give health care providers gifts or pay for entertainment, sporting events, trips or other perquisites, may be viewed as an attempt to buy loyalty to the manufacturer's products. For example, the federal government has enforced the Anti-Kickback Statute to reach large settlements with device manufacturers based on allegedly sham consultant arrangements with physicians. A number of states also have anti-kickback laws that establish similar prohibitions that may apply to items or services reimbursed by government programs as well as any third-party payors, including commercial insurers.

Further, recently enacted federal legislation, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively "PPACA"), among other things, clarified the intent requirements of the Federal Anti-Kickback Statute and the federal criminal statutes governing healthcare fraud. Specifically, a person or entity can be found to have violated the statutes without actual knowledge of these statutes or specific intent to violate them. In addition, the PPACA amended the Social Security Act to provide that the government may assert that a claim including items or services resulting from a violation of the Federal Anti-Kickback Statute constitutes a false

or fraudulent claim for purposes of the Federal False Claims Act or federal civil money penalties statute. Recent amendments to the Federal False Claims Act provide that a violation of the Federal Anti-Kickback Statute is also a violation of the Federal False Claims Act, subjecting healthcare entities to treble damages and mandatory penalties for each false claim or statement.

Additionally, the civil Federal False Claims Act prohibits, among other things, knowingly presenting or causing the presentation of a false, fictitious or fraudulent claim for payment of federal funds, or knowingly

TABLE OF CONTENTS

making, or causing to be made, a false record or statement material to a false or fraudulent claim to avoid, decrease or conceal an obligation to pay money to the federal government. The purpose of the Federal False Claims Act is to prevent manufacturers from causing or inducing inappropriate prescriptions leading to an inappropriate government reimbursement. It often comes into play where a manufacturer suggests or assists a health care provider to bill for an off-label, uncovered use. It also can occur when the reimbursement advice given by a manufacturer results in inappropriate reimbursement claims from upcoding, miscoding, stretched coding, the use of inappropriate modifiers or inappropriate care settings. These behaviors can result in the government paying for products or procedures that should not be reimbursed by the federal government. The manufacturer must be truthful and not misleading in the reimbursement advice it gives to customers.

Actions under the Federal False Claims Act may be brought by the Attorney General or as a qui tam action by a private individual in the name of the government. Violations of the Federal False Claims Act can result in very significant monetary penalties and treble damages. The federal government is using the Federal False Claims Act, and the accompanying threat of significant liability, in its investigations of healthcare companies throughout the country for a wide variety of Medicare billing practices, as well as federal Anti-Kickback Statute violations and certain marketing practices, including off-label promotion, and has obtained multi-million and multi-billion dollar settlements under the Federal False Claims Act in addition to individual criminal convictions under applicable criminal statutes.

Given the significant size of actual and potential settlements, it is expected that the government will continue to devote substantial resources to investigating healthcare providers and suppliers compliance with the healthcare reimbursement rules and fraud and abuse laws.

The Federal False Claims Act amendments in 2009 and 2010 expanded the scope of the liability for health care entities generally to potentially reach violations of regulatory duties, such as good manufacturing practices. There have been large settlements in the life sciences arena related to FDA regulatory violations for promotional activities and good manufacturing practices.

Even in instances where a company may have no actual liability, the Federal False Claims Act private citizen provisions (qui tam) allow the filing of Federal False Claims Act actions under seal and impose a mandatory duty on the United States Department of Justice to investigate such allegations. Most private citizen actions are declined by the Department of Justice or dismissed by federal courts. However, the investigation costs for a company can be significant and material even if the allegations are without merit.

Federal False Claims Act liability is potentially significant in the health industry because the statute provides for treble damages and mandatory minimum penalties of \$5,500 to \$11,000 per false claim or statement. Because of the potential for large monetary exposure, health care companies resolve allegations without admissions of liability for significant and material amounts to avoid the uncertainty of treble damages that may awarded in litigation proceedings. They may be required, however, to enter into corporate integrity agreements with the government, which may impose substantial costs to companies to ensure compliance.

There has also been a recent trend of increased federal and state regulation requiring the public disclosure of payments and transfers of value provided to healthcare professionals or entities. The Federal Physician Payments Sunshine Act imposes annual reporting requirements on device manufacturers for payments and other transfers of value provided by them, directly or indirectly, to physicians (including physician family members) and teaching hospitals, as well as ownership and investment interests held by physicians. A manufacturer's failure to submit timely, accurately and completely the required information for all payments, transfers of value or ownership or investment interests may result in civil monetary penalties of up to an aggregate of \$150,000 per year, and up to an aggregate of \$1.0 million per year for knowing failures. Manufacturers must submit reports by the 15th day of each calendar year. Certain states also mandate implementation of commercial compliance programs, impose restrictions on device manufacturer

marketing practices and require tracking and reporting of gifts, compensation and other remuneration to healthcare professionals and entities. The shifting commercial compliance environment and the need to build and maintain robust and expandable systems to comply with different compliance or reporting requirements in multiple jurisdictions increase the possibility that a healthcare company may fail to comply fully with one or more of these requirements.

TABLE OF CONTENTS

If a governmental authority were to conclude that Xtant is not in compliance with applicable laws and regulations, Xtant and its officers and employees could be subject to severe criminal and civil penalties, including, for example, exclusion from participation as a supplier of product to beneficiaries covered by Medicare, Medicaid and other federal health care programs.

Our United States operations are subject to the U.S. Foreign Corrupt Practices Act (FCPA). We are required to comply with the FCPA, which generally prohibits covered entities and their intermediaries from engaging in bribery or making other prohibited payments to foreign officials for the purpose of obtaining or retaining business or other benefits. In addition, the FCPA imposes accounting standards and requirements on publicly traded United States corporations and their foreign affiliates, which are intended to prevent the diversion of corporate funds to the payment of bribes and other improper payments, and to prevent the establishment of off books slush funds from which such improper payments can be made. We also are subject to similar anticorruption legislation implemented in Europe under the Organization for Economic Co-operation and Development's Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.

Coverage and Reimbursement

Xtant's currently approved products are commonly treated as general supplies utilized in spinal and orthopedic surgery and if covered by third-party payors, are paid for as part of the surgical procedure. Accordingly, healthcare providers in the United States generally rely on third-party payors, principally private insurers and governmental payors such as Medicare and Medicaid, to cover and reimburse all or part of the cost of a spine surgery in which Xtant products are used. Sales volumes and fees for Xtant products will continue to depend in large part on the availability of coverage and reimbursement from such third-party payors. Third-party payors perform analyses on new technologies to determine if they are medically necessary before providing coverage for them. These third-party payors may still deny reimbursement on covered technologies if they determine that a device used in a procedure was not used in accordance with the payor's coverage policy. Particularly in the United States, third-party payors continue to carefully review, and increasingly challenge, the prices charged for procedures and medical products.

In the United States, a large percentage of insured individuals receive their medical care through managed care programs, which monitor and often require pre-approval of the services that a member will receive. Some managed care programs pay their providers on a per capita basis, which puts the providers at financial risk for the services provided to their patients by paying these providers a predetermined payment per member per month and, consequently, may limit the willingness of these providers to use Xtant products.

The overall escalating cost of medical products and services has led to, and will likely continue to lead to increased pressures on the healthcare industry to reduce the costs of products and services. Government or private third-party payors cannot be guaranteed to cover and reimburse the procedures using Xtant products in whole or in part in the future or that payment rates will be adequate. In addition, it is possible that future legislation, regulation or coverage and reimbursement policies of third-party payors will adversely affect the demand for Xtant products or the ability to sell them on a profitable basis.

Internationally, reimbursement and healthcare payment systems vary substantially from country to country and include single-payor, government-managed systems as well as systems in which private payors and government managed systems exist side-by-side. Xtant's ability to achieve market acceptance or significant sales volume in international markets will be dependent in large part on the availability of reimbursement for procedures performed using company products under the healthcare payment systems in such markets. A number of countries may require Xtant to gather additional clinical data before recognizing coverage and reimbursement for its products.

ISO Certification

Xtant is proud to be an International Organization for Standardization (ISO) certified organization, which declares our company-wide commitment to quality. To obtain ISO 13485:2003 certification, an organization must demonstrate its ability to provide medical devices that consistently meet applicable customer and regulatory requirements. The primary objective of ISO 13485:2003 is to facilitate harmonized medical device regulatory requirements for quality management systems. All requirements of ISO 13485:2003 are specific to

19

TABLE OF CONTENTS

organizations providing medical devices, regardless of the type or size of the organization. The certification assures our customers and partners of our commitment to quality, and in the quality of our innovative products and processes. Additionally, we believe that our ISO 13485:2003 certification offers new markets and business opportunities for our products in the global marketplace.

Employees

As of August, 2016, Xtant had 250 full-time employees and 255 total employees, of whom 103 were in operations, 62 were in sales, 13 were in marketing, 15 were in R&D and Engineering, 34 were in QA/QC, and 28 were in administrative functions. In addition, we make use of a varying number of outsourced services to manage normal business cycles. None of our employees are covered by a collective bargaining agreement and management considers relations with employees and service partners to be good.

Facilities

We lease approximately 17,700 square feet in a building located at 600 Cruiser Lane, Belgrade, Montana 59714. This space includes six Class 100 (ISO 5) clean rooms, a fully equipped diagnostics laboratory, microbiology laboratory and testing laboratory. We lease the building under a ten-year operating lease which runs through August 2023. The lease also has a ten-year renewal option.

We lease an approximately 14,000 square foot facility at 664 Cruiser Lane, Belgrade, Montana 59714., which was involved in a sale-leaseback transaction in October, 2015 (See Note 12, Commitments and Contingencies to our audited consolidated financial statements for the year ended December 31, 2015). This building is an FDA registered facility with a Class 10,000 (ISO 7) environmentally controlled area. The validated manufacturing areas and laboratory facilities located in this facility provide processing and testing space to manufacture medical devices pursuant to FDA, GMP regulations, and ISO 13485:2003. The facility is registered with the FDA for device design, device manufacture, and contract manufacture, as well as for screening, testing, storing, and distributing biological tissues.

We also lease a 21,000 square foot facility at 732 Cruiser Lane, Belgrade, Montana 59714, where one Class 1,000 (ISO 6) clean room is located.

We also lease a facility at 452 Alexandersville Road, Miamisburg, Ohio 45342. The leased property contains approximately 31,600 square feet, of which approximately 19,260 square feet are office space and approximately 4,740 square feet are warehouse space. The space includes a 7,600 square feet of manufacturing space with multi-axis CNC machining capacity. The facility specializes in the manufacturing of prototypes, custom instrumentation, test fixtures and key production items. The space includes an advanced biomechanical laboratory and a full bioskills lab for cadaver surgery and clinician training. The leased facility renewal term begins December 1, 2016 and runs through November 30, 2019 and has a three-year renewal option.

We lease additional office space located at 363 Centennial Parkway, Louisville, Colorado 80027.

Recent Developments

On March 31, 2016, our credit agreement was amended to extend the time frame during which interest can accrue on loans in lieu of making interest payments from December 31, 2015 to March 31, 2016, and to lower the minimum required liquidity amount to \$500,000 prior to June 30, 2016. At all times after June 30, 2016 and until January 1, 2017, we are required to maintain a minimum liquidity amount of \$2,500,000 or greater.

On April 14, 2016, we issued in a private placement to the OrbiMed purchasers \$2,238,166.45 aggregate principal amount of promissory notes.

On May 25, 2016, we entered into a Loan and Security Agreement (the LSA) with Silicon Valley Bank, a California corporation (the Bank), pursuant to which the Bank agreed to provide us with a revolving line of credit in the aggregate principal amount of \$6,000,000, bearing interest at a floating per annum rate equal to one percentage point (1.00%) above the Prime Rate (as that term is defined in the LSA). The line of credit is secured by a first priority perfected security interest in certain of our assets (including our patent and trademark assets) in favor of the Bank. The maturity date of the revolving line of credit is May 25, 2019.

TABLE OF CONTENTS

On July 29, 2016 we entered into the Fourth Amendment to Amended and Restated Credit Agreement (the Amendment) with OrbiMed and ROS, which amended the facility. The Amendment modified the facility by including an additional Tranche A Commitment in an amount up to \$1,000,000 from ROS and OrbiMed, which was made available to us on July 29, 2016. The facility continues to be secured by a security interest in certain of our assets (including our patent and trademark assets).

On August 12, 2016, we entered into a First Loan Modification Agreement (the Modification Agreement) with the Bank, which amended certain provisions of the LSA. Pursuant to the terms of the Modification Agreement, the Bank increased the aggregate principal amount of the revolving line of credit to \$11,000,000. Any principal amounts outstanding now bear interest at a floating per annum rate equal to four percentage points (4.00%) above the Prime Rate (as that term is defined in the Modification Agreement).

On August 15, 2016, we received a letter from NYSE MKT notifying us that we are not in compliance with NYSE MKT's continued listing standards. Specifically, we are not in compliance with Section 1003(a)(i) of the Company Guide with stockholders' equity of less than \$2,000,000 and net losses in two of our three most recent fiscal years, Section 1003(a)(ii) with stockholders' equity of less than \$4,000,000 and net losses in three of our four most recent fiscal years and Section 1003(a)(iii) of the Company Guide with stockholders' equity of less than \$6,000,000 and net losses in five of our most recent fiscal years. Therefore, we have become subject to the procedures and requirements of Section 1009 of the Company guide and must submit a plan of compliance by September 15, 2016, addressing how we intend to regain compliance with Sections 1003(a)(i), 1003(a)(ii) and 1003(a)(iii) of the Company Guide by February 15, 2018.

This notice has no effect on the listing of the Common Stock at this time, subject to compliance with other NYSE MKT continued listing standards; however, the consolidated tape now includes a .BC indicator, which will be removed at such time as the Company is deemed compliant with NYSE MKT's continued listing standards. However, because we are not currently in compliance with Section 1003(a)(i) of the Company Guide, we are not currently eligible to list the Warrants on NYSE MKT. The Company intends to submit a business plan and intends to address the issue through the successful completion of the Rights Offering.

TABLE OF CONTENTS

SUMMARY OF THE RIGHTS OFFERING

Securities to be offered:

We are distributing to you, at no charge, two non-transferable Subscription Rights to each purchase one Unit for every share of our Common Stock that you owned on the Record Date, either as a holder of record or, in the case of shares held of record by brokers, banks, or other nominees, on your behalf, as a beneficial owner of such shares.

Each Unit consists of one share of Common Stock and of a Warrant representing the right to purchase one share of Common Stock at an exercise price of \$ per share.

For certain investors whose subscriptions may result in the purchaser beneficially owning more than 4.99% of our outstanding Common Stock, such investors may elect to receive in the Rights Offering, in lieu of shares of Common Stock, certain pre-funded warrants (which we refer to as the Pre-Funded Warrants) to purchase the same number of shares of Common Stock. If you do not wish to exceed the ownership threshold, you may elect to receive a Pre-Funded Warrant in lieu of any share of Common Stock underlying the Units for which you have subscribed.

You will not be eligible to elect to receive Pre-Funded Warrants, except to the extent that your beneficial ownership could exceed 4.99% of the shares of Common Stock outstanding following the consummation of the Rights Offering. Each Pre-Funded Warrant will have an exercise price of \$0.01, and the subscription price per Unit for any such electing investors will be \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company.

Size of offering:

Units, each consisting of one share of Common Stock and of a Warrant representing the right to purchase one share of Common Stock at an exercise price of \$ per share.

Subscription Price:

\$ per Unit. The Subscription Price per Unit will be determined by our board of directors prior to the effectiveness of the registration statement of which this prospectus is a part.

Warrants:

Each Warrant entitles the holder to purchase one share of Common Stock at an exercise price of \$ per share, from the date of issuance through its expiration on . The Warrants will be exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights, and if we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. After the one-year anniversary of issuance, we may redeem the Warrants for \$0.01 per Warrant if the volume weighted average price of our Common Stock is above \$ per share, for each of 10 consecutive trading days.

TABLE OF CONTENTS

Pre-Funded Warrants:

Each Pre-Funded Warrant entitles the holder to purchase one share of Common Stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration 12 years after the date of issuance. The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market. The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company. See Description of Securities Pre-Funded Warrants Issuable in Lieu of Common Stock in the Rights Offering.

Record Date:

5:00 PM Eastern Time, , 2016.

Subscription Right:

Each Subscription Right consists of a Basic Subscription Right and an Over-Subscription Privilege.

Basic Subscription Rights:

Basic Subscription Right will entitle you to purchase one Unit at the Subscription Price.

Over-Subscription Privilege:

If you exercise your Basic Subscription Rights in full, you may also choose to purchase a portion of any Units that are not purchased by our other stockholders through the exercise of their Basic Subscription Rights. You may subscribe for additional Units pursuant to this Over-Subscription Privilege, subject to proration described elsewhere.

Expiration date:

The Subscription Rights will expire at 5:00 PM Eastern Time, on , 2016. We reserve the right to extend the expiration date in our sole discretion.

Procedure for exercising Subscription Rights:

To exercise your Subscription Rights, you must take the following steps:

If you are a record holder of our Common Stock, you must deliver payment and a properly completed Subscription Rights Statement to the Subscription Agent to be received before 5:00 PM Eastern Time, on , 2016. You may deliver the documents and payments by first class mail or courier service. If you use first class mail for this purpose, we recommend using registered mail, properly insured, with return receipt requested.

If you are a beneficial owner of shares that are registered in the name of a broker, dealer, custodian bank, or other nominee, you should instruct your broker, dealer, custodian bank, or other nominee to exercise your Subscription Rights on your behalf. Please follow the instructions of your nominee, who may require that you meet a deadline earlier than 5:00 PM Eastern Time, on , 2016.

Delivery of shares, Warrants and Pre-Funded Warrants:

As soon as practicable after the expiration of the Rights Offering, the Subscription Agent will arrange for the issuance of the shares of Common Stock, Warrants and Pre-Funded Warrants purchased

TABLE OF CONTENTS

pursuant to the Rights Offering. All shares and Warrants that are purchased in the Rights Offering will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares. If you hold your shares in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights Offering. The Pre-Funded Warrants will be issued in certificated form.

Non-transferability of Subscription Rights:

The Subscription Rights may not be sold, transferred, assigned or given away to anyone. The Subscription Rights will not be listed for trading on any stock exchange or market.

Transferability of Warrants:

The Warrants will be separately transferable following their issuance and through their expiration years from the issuance date.

No board recommendation:

Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. You are urged to make your decision to invest based on your own assessment of our business and the Rights Offering. Please see Risk Factors for a discussion of some of the risks involved in investing in our securities.

Directors and Officers:

While none of our directors or executive officers has entered into any binding commitment or agreement to exercise Subscription Rights received in the Rights Offering, our directors and executive officers have indicated interests in subscribing for up to an aggregate of \$ in the Rights Offering, subject to potential proration.

No revocation:

All exercises of Subscription Rights are irrevocable, even if you later learn of information that you consider to be unfavorable to the exercise of your Subscription Rights.

Use of proceeds:

We intend to use the net proceeds from this Rights Offering:

to provide equity capital to support the continuing execution of the Company's growth strategy, specifically to increase surgical instruments and fixation and biologics inventory, and

for general corporate purposes, including research and development, business development and operational purposes.

See Use of Proceeds.

Material U.S. federal income tax consequences:

For U.S. federal income tax purposes, we do not believe you should recognize income or loss upon receipt or exercise of a Subscription Right. You should consult your own tax advisor as to the tax consequences of the Rights Offering in light of your particular circumstances. See Material U.S. Federal Income Tax Consequences on page 46.

TABLE OF CONTENTS

Extension and termination:

Although we do not presently intend to do so, we may extend the Rights Offering for additional time in our sole discretion. Our board of directors may for any reason terminate the Rights Offering at any time before the completion of the Rights Offering.

Subscription Agent:

Corporate Stock Transfer, Inc.

Questions:

If you have any questions about the Rights Offering, please contact the dealer-manager, Maxim Group LLC, at 405 Lexington Avenue, New York, New York 10174, Attention Syndicate Department, email: syndicate@maximgrp.com or telephone: (212) 895-3745.

Market for Common Stock:

Our Common Stock is listed on NYSE MKT under the symbol XTNT. See Market Price of and Dividends on our Common Stock on page 37.

Risk factors:

Before you exercise your Subscription Rights to purchase Units, you should be aware that there are risks associated with your investment, and you should carefully read and consider risks described in the section captioned Risk Factors together with all of the other information included in this prospectus.

Dealer-Manager:

Maxim Group LLC.

Distribution arrangements:

Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will use its best efforts to solicit the exercise of Subscription Rights. We have agreed to pay the dealer-manager certain fees for acting as dealer-manager and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of Common Stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of Common Stock or Warrants. See Plan of Distribution on page 58 for a discussion of the fees and expenses to be paid to the dealer-manager.

25

TABLE OF CONTENTS

RISK FACTORS

Our business and an investment in our securities are subject to a variety of risks. The following risk factors describe some of the most significant events, facts or circumstances that could have a material adverse effect upon our business, financial condition, results of operations, ability to implement our business plan and the market price for our securities. Many of these events are outside of our control. If any of these risks actually occurs, our business, financial condition or results of operations may be materially adversely affected. In such case, the trading price of our Common Stock could decline and investors in our Common Stock could lose all or part of their investment.

Before making an investment decision, you should carefully consider these risks, including those set forth below and those described in the Risk Factors section of our most recent Annual Report on Form 10-K, filed with the Commission on March 24, 2016, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which is incorporated by reference into this prospectus, and you should also carefully consider any other information we include or incorporate by reference in this prospectus.

Risks Related to the Rights Offering

We will incur substantial expenses in connection with the Rights Offering, which may not return adequate value if the Rights Offering is ultimately not consummated or successful.

The estimated expenses for the Rights Offering are approximately \$, excluding fees and expenses of the dealer-manager that we have engaged to assist us with the Rights Offering. If the registration statement of which this prospectus is a part is not declared effective, the Rights Offering is not commenced or the Rights Offering is not ultimately consummated or successful, we will incur these expenses nonetheless. We will provide to the dealer-manager upon completion of the Rights Offering a non-accountable expense allowance equal to \$75,000 for expenses incurred in connection with the Rights Offering. We advanced \$30,000 against out-of-pocket accountable expenses to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us any portion of the advance not used for actual out-of-pocket expenses. See Plan of Distribution on page 58.

Your interest in the Company may be diluted as a result of this Rights Offering or due to other transactions.

Stockholders who do not fully exercise their Subscription Rights should expect that they will, at the completion of this offering, own a smaller proportional interest in the Company than would otherwise be the case had they fully exercised their Basic Subscription Right and Over-Subscription Privilege. Further, the shares issuable upon the exercise of the Warrants to be issued pursuant to the Rights Offering will dilute the ownership interest of stockholders not participating in this offering or holders of Warrants issued pursuant to this offering who have not exercised them.

In addition, as of June 30, 2016, there were approximately 22,396,279 shares of our Common Stock underlying outstanding convertible notes (subject to adjustment), 1,235,896 shares of Common Stock underlying outstanding warrants and 562,206 shares of Common Stock underlying outstanding stock options. The conversion or exercise of all or a portion of these notes, warrants or options would result in additional dilution to your ownership interest. If we

do not increase our revenue or reduce our expenses, we may need to raise additional capital, which may result in further dilution to our stockholders. We may also consider other options from time to time in order to improve our capital structure, including restructuring or amending the terms of our existing convertible notes, any of which may result in additional dilution to our stockholders.

Further, because the price per Unit being offered may be substantially higher than the net tangible book value per share of our Common Stock, you may suffer substantial dilution in the net tangible book value of the Common Stock you purchase in this offering. If you purchase Units in this offering at the Subscription Price, you may suffer immediate and substantial dilution in the net tangible book value of the Common Stock. See Dilution in this prospectus for a more detailed discussion of the dilution which may incur in connection with this offering.

TABLE OF CONTENTS

We must increase our shareholders' equity by February 15, 2018, to avoid a delisting action by NYSE MKT.

NYSE MKT notified us on August 15, 2016, that we have fallen out of compliance with NYSE MKT's continued listing standards. Specifically, we are not in compliance with Section 1003(a)(i) of the Company Guide with stockholders' equity of less than \$2,000,000 and net losses in two of our three most recent fiscal years, Section 1003(a)(ii) with stockholders' equity of less than \$4,000,000 and net losses in three of our four most recent fiscal years and Section 1003(a)(iii) of the Company Guide with stockholders' equity of less than \$6,000,000 and net losses in five of our most recent fiscal years.

This notice has no effect on the listing of the Common Stock at this time, subject to compliance with other NYSE MKT continued listing standards; however, the consolidated tape now includes a .BC indicator, which will be removed at such time as the Company is deemed compliant with NYSE MKT's continued listing standards. However, because we are not currently in compliance with Section 1003(a)(i) of the Company Guide, we are not currently eligible to list the Warrants on NYSE MKT.

As a result, we must submit a plan by September 15, 2016, to regain compliance prior to February 15, 2018. If we fail to submit the plan or to fulfill it in the allotted time, our shares may be delisted from NYSE MKT, and it would become very difficult to trade our shares based on a lack of liquidity. We believe that successful completion of this rights offering will enable us to satisfy even this higher shareholders' equity requirement, but if we fail to raise sufficient shareholders' equity by February 15, 2018, or if NYSE MKT does not accept our plan to regain compliance, our shares could be delisted.

Completion of the Rights Offering is not subject to us raising a minimum offering amount and we will still need additional funding to carry out our proposed operating activities after the Rights Offering.

Completion of the Rights Offering is not subject to us raising a minimum offering amount and therefore the net proceeds from the Rights Offering may be insufficient to meet our objectives, thereby increasing the risk to investors in this offering, including investing in a company that continues to require capital.

This Rights Offering may cause the trading price of our Common Stock to decrease.

The Subscription Price, together with the number of shares of Common Stock we propose to issue and ultimately will issue if this Rights Offering is completed, may result in an immediate decrease in the market price of our Common Stock. This decrease may continue after the completion of this Rights Offering. If that occurs, you may have committed to buy shares of Common Stock in the Rights Offering at a price greater than the prevailing market price. We cannot predict the effect, if any, that the availability of shares for future sale represented by the Warrants issued in connection with the Rights Offering, or the ability to trade the Warrants themselves, will have on the market price of our Common Stock from time to time. Further, if a substantial number of Subscription Rights are exercised and the holders of the shares received upon exercise of those Subscription Rights or the related Warrants choose to sell some or all of the shares underlying the Subscription Rights or the related Warrants, the resulting sales could depress the market price of our Common Stock. Following the exercise of your Subscription Rights you may not be able to sell your Common Stock at a price equal to or greater than the Subscription Price.

We must increase our shareholders' equity by February 15, 2018, to avoid a delisting action by NYSE MKT.

Because the exercise of your Subscription Rights is not revocable, you could be committed to buying shares of Common Stock above the prevailing market price.

Once you exercise your Subscription Rights, you may not revoke such exercise even if you later learn information that you consider to be unfavorable to the exercise of your Subscription Rights. The market price of our shares of Common Stock may decline prior to the expiration of this offering or a Subscribing Rights holder may not be able to sell shares of Common Stock purchased in this offering at a price equal to or greater than the Subscription Price. Until shares of our Common Stock are delivered upon expiration of the Rights Offering, you will not be able to sell or transfer the shares of our Common Stock that you purchase in the Rights Offering. Any such delivery will occur as soon as practicable after the Rights Offering has expired, payment for the shares of Common Stock and attached Warrants subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected.

TABLE OF CONTENTS

If we terminate this offering for any reason, we will have no obligation other than to return subscription monies as soon as practicable.

We may decide, in our sole discretion and for any reason, to cancel or terminate the Rights Offering at any time prior to the expiration date. If this offering is cancelled or terminated, we will have no obligation with respect to Subscription Rights that have been exercised except to return as soon as practicable, without interest, the subscription payments deposited with the Subscription Agent.

If we terminate this offering and you have not exercised any Subscription Rights, such Subscription Rights will expire worthless.

Our Common Stock price may be volatile as a result of this Rights Offering.

The trading price of our Common Stock may fluctuate substantially. The price of the Common Stock that will prevail in the market after this offering may be higher or lower than the Subscription Price 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:

- regulatory actions with respect to our products or our competitors' products;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- the success of competitive products or technologies;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- announcement or expectation of additional financing efforts;
- sales of our Common Stock by us, our insiders or our other stockholders;
- market conditions in our core business sectors; and
- general economic, industry and 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 may cause declines in the trading price and market value of our Common Stock.

The Subscription Price determined for this offering is not an indication of the fair value of our Common Stock.

In determining the Subscription Price, our board of directors considered a number of factors, including, but not limited to, the price at which our stockholders might be willing to participate in the Rights Offering, the value of the Warrant being issued as a component of the Unit, historical and current trading prices for our Common Stock, the amount of

If we terminate this offering for any reason, we will have no obligation other than to return subscription monies as soon as

proceeds desired, the potential need for liquidity and capital, potential market conditions, and the desire to provide an opportunity to our stockholders to participate in the Rights Offering. In conjunction with its review of these factors, our board of directors also reviewed a range of discounts to

TABLE OF CONTENTS

market value represented by the subscription prices in various prior Rights Offerings by other public companies. The Subscription Price does not necessarily bear any relationship to the book value of our assets, results of operations, cash flows, losses, financial condition or any other established criteria for value. You should not consider the Subscription Price as an indication of the fair value of our Common Stock. After the date of this prospectus, our Common Stock may trade at prices above or below the Subscription Price.

If you do not act on a timely basis and follow subscription instructions, your exercise of Subscription Rights may be rejected.

Holders of Subscription Rights who desire to purchase shares of our Common Stock and attached Warrants in this offering must act on a timely basis to ensure that all required forms and payments are actually received by the Subscription Agent prior to 5:00 PM Eastern Time, on the expiration date, unless extended. If you are a beneficial owner of shares of Common Stock and you wish to exercise your Subscription Rights, you must act promptly to ensure that your broker, dealer, custodian bank, trustee or other nominee acts for you and that all required forms and payments are actually received by your broker, dealer, custodian bank, trustee or other nominee in sufficient time to deliver such forms and payments to the Subscription Agent to exercise the Subscription Rights granted in this offering that you beneficially own prior to 5:00 PM Eastern Time on the expiration date, as may be extended. We will not be responsible if your broker, dealer, custodian bank, trustee or other nominee fails to ensure that all required forms and payments are actually received by the Subscription Agent prior to 5:00 PM Eastern Time, on the expiration date.

If you fail to complete and sign the required subscription forms, send an incorrect payment amount, or otherwise fail to follow the subscription procedures that apply to your exercise in this Rights Offering, the Subscription Agent may, depending on the circumstances, reject your subscription or accept it only to the extent of the payment received. Neither we nor the Subscription Agent undertakes to contact you concerning an incomplete or incorrect subscription form or payment, nor are we under any obligation to correct such forms or payment. We have the sole discretion to determine whether a subscription exercise properly follows the subscription procedures.

You may not receive all of the Units for which you over-subscribe.

Holders who fully exercise their Basic Subscription Rights will be entitled to subscribe for an additional number of Units. Over-Subscription Privileges will be allocated pro rata among Rights holders who over-subscribed, based on the number of over-subscription Units to which they have subscribed. We cannot guarantee that you will receive any or the entire number of Units for which you over-subscribed. If the prorated number of Units allocated to you in connection with your Over-Subscription Privilege is less than your Over-Subscription Request, then the excess funds held by the Subscription Agent on your behalf will be returned to you, without interest, as soon as practicable after the Rights Offering has expired and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected, and we will have no further obligations to you.

The receipt of Subscription Rights may be treated as a taxable distribution to you.

We believe the distribution of the Subscription Rights in this Rights Offering should be a non-taxable distribution to holders of shares of Common Stock under Section 305(a) of the Internal Revenue Code of 1986, as amended, or the Code. Please see the discussion on the Material U.S. Federal Income Tax Consequences on page 46. This position is not binding on the IRS, or the courts, however. If this Rights Offering is deemed to be part of a disproportionate distribution under Section 305 of the Code, your receipt of Subscription Rights in this offering may be treated as the

If you do not act on a timely basis and follow subscription instructions, your exercise of Subscription Rights may be

receipt of a taxable distribution to you equal to the fair market value of the Subscription Rights. Any such distribution would be treated as dividend income to the extent of our current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Each holder of shares of Common Stock is urged to consult his, her or its own tax advisor with respect to the particular tax consequences of this Rights Offering.

TABLE OF CONTENTS

The Subscription Rights are not transferable, and there is no market for the Subscription Rights.

You may not sell, transfer, assign or give away your Subscription Rights. Because the Subscription Rights are non-transferable, there is no market or other means for you to directly realize any value associated with the Subscription Rights. You must exercise the Subscription Rights to realize any potential value from your Subscription Rights.

Absence of a public trading market for the Warrants may limit your ability to resell the Warrants.

There is no established trading market for the Warrants to be issued pursuant to this offering, and the Warrants may not be widely distributed. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights, and if we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. There also can be no assurance that a market will develop for the Warrants. Even if a market for the Warrants does develop, the price of the Warrants may fluctuate and liquidity may be limited. If the Warrants are not accepted for trading on the OTCBB or listing on NYSE MKT or if a market for the Warrants does not develop, then purchasers of the Warrants may be unable to resell the Warrants or sell them only at an unfavorable price for an extended period of time, if at all. Even if the Warrants become listed on NYSE MKT, the Warrants will not be listed immediately following the closing of the Rights Offering.

Securities traded on the OTCBB are usually thinly traded, highly volatile, have fewer market makers and are not followed by analysts. Therefore, prices for securities traded solely on the OTCBB may be difficult to obtain and holders of our securities may be unable to resell their securities at or near their original acquisition price, or at any price. Further, there is no assurance that the application for quotation of those securities on the OTCBB will be accepted by the OTCBB or, in the future, NYSE MKT. If the Warrants are not listed on a securities exchange or quoted on the OTCBB, you may not be able to sell those securities.

Future trading prices of the Warrants will also depend on many other factors, including:

our operating performance and financial condition;
our ability to continue the effectiveness of the registration statement, of which this prospectus is a part, covering the Warrants and the Common Stock issuable upon exercise of the Warrants;
the interest of securities dealers in making a market; and
the market for similar securities.

There is no market for the Pre-Funded Warrants.

There is no established trading market for the Pre-Funded Warrants to be issued pursuant to this offering, if any, and the Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

The market price of our Common Stock may never exceed the exercise price of the Warrants issued in connection with this offering.

The Warrants being issued in connection with this offering become exercisable upon issuance and will expire years after issuance. We cannot provide you any assurance that the market price of our Common Stock will ever

exceed the exercise price of the Warrants prior to their date of expiration. Any Warrants not exercised by their date of expiration will expire worthless and we will be under no further obligation to the Warrant holder.

The Warrants may be redeemed on short notice. This may have an adverse impact on their price.

After the one-year anniversary of issuance, we may redeem the Warrants for \$0.01 per Warrant once the closing price of our Common Stock has equaled or exceeded \$ per share, subject to adjustment, for 10 consecutive trading days. If we give notice of redemption, you will be forced to sell or exercise your Warrants or accept the redemption price. The notice of redemption could come at a time when it is not advisable or possible for you to exercise the Warrants. As a result, you would be unable to benefit from owning the Warrants being redeemed.

TABLE OF CONTENTS

The dealer-manager is not underwriting, nor acting as placement agent of, the Subscription Rights or the securities underlying the Subscription Rights.

Maxim Group LLC is acting as dealer-manager for this Rights Offering. Under the terms and subject to the conditions contained in the dealer-manager agreement, the dealer-manager will provide marketing assistance in connection with this offering. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of Common Stock or Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of Common Stock or Warrants. The dealer-manager will not be subject to any liability to us in rendering the services contemplated by the dealer-manager agreement except for any act of bad faith or gross negligence by the dealer-manager. The services of the dealer-manager to us in connection with this offering cannot be construed as any assurance that this offering will be successful.

Since the Warrants and Pre-Funded Warrants are executory contracts, they may have no value in a bankruptcy or reorganization proceeding.

In the event a bankruptcy or reorganization proceeding is commenced by or against us, a bankruptcy court may hold that any unexercised Warrants and Pre-Funded Warrants are executory contracts that are subject to rejection by us with the approval of the bankruptcy court. As a result, holders of the Warrants and Pre-Funded Warrants may, even if we have sufficient funds, not be entitled to receive any consideration for their Warrants and Pre-Funded Warrants or may receive an amount less than they would be entitled to if they had exercised their Warrants and Pre-Funded Warrants prior to the commencement of any such bankruptcy or reorganization proceeding.

TABLE OF CONTENTS

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

The statements set forth and incorporated by reference in this prospectus 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, 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 set forth and incorporated by reference in this prospectus may include, for example, statements about:

our ability to integrate the acquisition of X-spine Systems, Inc. and any other business combinations or acquisitions successfully;

our ability to remain listed on NYSE MKT;
our ability to obtain financing on reasonable terms;

our ability to increase revenue;
our ability to comply with the covenants in our credit facility;
our ability to maintain sufficient liquidity to fund our operations;
the ability of our sales force to achieve expected results;
our ability to remain competitive;

government regulations;
our ability to innovate and develop new products;
our ability to obtain donor cadavers for our products;
our ability to engage and retain qualified technical personnel and members of our management team;
the availability of our facilities;

government and third-party coverage and reimbursement for our products;
our ability to obtain regulatory approvals;
our ability to successfully integrate recent and future business combinations or acquisitions;
our ability to use our net operating loss carry-forwards to offset future taxable income;
our ability to deduct all or a portion of the interest payments on the notes for U.S. federal income tax purposes;

our ability to service our debt;
product liability claims and other litigation to which we may be subjected;
product recalls and defects;
timing and results of clinical studies;
our ability to obtain and protect our intellectual property and proprietary rights;
infringement and ownership of intellectual property;
our ability to remain accredited with the American Association of Tissue Banks;
influence by our management;

TABLE OF CONTENTS

our ability to pay dividends; and
our ability to issue preferred stock.

The forward-looking statements set forth and incorporated by reference in this prospectus 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 the Risk Factors section of this prospectus and the documents incorporated by reference. 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 undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required under applicable securities laws.

You should also read carefully the factors described in the Risk Factors in our annual report on Form 10-K filed with the SEC on March 24, 2016, 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.

TABLE OF CONTENTS

USE OF PROCEEDS

Assuming that all Units are sold in the Rights Offering and no elections to receive Pre-Funded Warrants are made, we estimate that the net proceeds from the Rights Offering will be approximately \$ million, based on a Subscription Price of \$ per Unit, after deducting fees and expenses payable to the dealer-manager, and after deducting other expenses payable by us and excluding any proceeds received upon exercise of any Warrants issued in the Rights Offering.

We intend to use the net proceeds from this Rights Offering primarily for to provide equity capital to support the continuing execution of the Company's growth strategy, specifically to increase surgical instruments and fixation and biologics inventory, diversify our supply of donor tissue, expand our processing capabilities and develop a hybrid sales force, and for general corporate purposes, including research and development, business development and operational purposes.

Our management will have broad discretion in the application of the net proceeds from this offering, and investors will be relying on the judgment of our management with regard to the use of these net proceeds.

TABLE OF CONTENTS**CAPITALIZATION**

The following table presents our cash, cash equivalents and capitalization, as of June 30, 2016:

on an actual basis; and

on a pro forma as adjusted basis to give further effect to the sale by us in this Rights Offering of maximum of Units (consisting of shares of our Common Stock (assuming no Pre-Funded Warrants) and Warrants to purchase an aggregate of shares of Common Stock upon exercise), at the Subscription Price of \$ per Unit, and our receipt of the net proceeds from that sale after deducting estimated offering expenses.

The table below does not reflect the exercise of Warrants issued in connection with the Rights Offering. The pro forma as adjusted information set forth below assumes equity accounting for the Warrants, is illustrative only and will be adjusted based on the Units sold. You should read this information in conjunction with our consolidated financial statements and notes thereto incorporated by reference into this prospectus.

	As of June 30, 2016 (Unaudited)	
	Actual	Pro Forma as Adjusted
Cash, cash equivalents and trade accounts receivable	\$2,217,405	\$
Long-term debt:		
Total lease obligations (less current portion)	757,137	
Long-term debt (less issuance costs)	46,655,722	
6.00% convertible senior notes due 2021	68,792,700	
Total long-term debt	116,205,559	
Stockholders' equity:		
Preferred stock, \$0.000001 par value per share; 5,000,000 shares authorized; no shares issued and outstanding, actual and pro forma		
Common Stock, \$0.000001 par value per share; 95,000,000 shares authorized; 12,135,150 issued and outstanding	11	
Additional paid-in capital	82,603,270	
Accumulated deficit	(83,099,619)	
Total stockholders' (deficit) equity	(496,338)	
Total capitalization	\$115,709,221	\$

The number of outstanding shares of Common Stock in the table above excludes, as of June 30, 2016:

562,206 shares issuable upon the exercise of outstanding stock options with a weighted average exercise price of \$10.83 per share;

1,235,986 shares issuable upon the exercise of outstanding warrants with a weighted average exercise price of \$7.65 per share;

Approximately 1 million shares available for issuance under our Amended and Restated Equity Incentive Plan; 1,071,629 shares reserved for issuance pursuant to a common stock purchase agreement with Aspire Capital Fund, LLC; and

22,396,279 shares reserved for issuance upon conversion of the notes.

TABLE OF CONTENTS**DILUTION**

Purchasers of our Common Stock in the Rights Offering (and upon exercise of the Warrants issued pursuant to this Rights Offering) will experience an immediate dilution of the net tangible book value per share of our Common Stock.

Our net tangible book value as of June 30, 2016 was negative \$38.6 million, or \$(3.18) per share of our Common Stock. Net tangible book value per share is equal to our total net tangible book value, which is our total tangible assets less our total liabilities, divided by the number of shares of our outstanding Common Stock. Dilution per share equals the difference between the amount per share paid by purchasers of shares of Common Stock in the Rights Offering and the net tangible book value per share of our Common Stock immediately after the Rights Offering.

Based on the sale by us in this Rights Offering of a maximum of Units (consisting of shares of our Common Stock (assuming no Pre-Funded Warrants) and Warrants to purchase an aggregate of shares of Common Stock upon exercise), at the Subscription Price of \$ per Unit, and after deducting estimated offering expenses and dealer-manager fees and expenses payable by us of \$ million, and the application of the estimated \$ million of net proceeds from the Rights Offering, assuming equity accounting for the Warrants, our pro forma net tangible book value as of June 30, 2016 would have been approximately \$, or \$ per share. This represents an immediate increase in pro forma net tangible book value to existing stockholders of \$ per share and an immediate dilution to purchasers in the Rights Offering of \$ per share.

The following table illustrates this per-share dilution on a pro forma basis, assuming a fully subscribed for Rights Offering of Units at the Subscription Price of \$ per Unit (assuming no Pre-Funded Warrants and excluding any issuance of shares of Common Stock upon exercise of Warrants):

Subscription Price	\$
Net tangible book value per share as of June 30, 2016, before Rights Offering	\$ (3.18)
Increase in net tangible book value per share attributable to Rights Offering	\$
Pro forma net tangible book value per share as of June 30, 2016, after giving effect to Rights Offering	
Dilution in net tangible book value per share to purchasers	\$

The information above is as of June 30, 2016 and excludes:

562,206 shares issuable upon the exercise of outstanding stock options with a weighted average exercise price of \$10.83 per share;

1,235,986 shares issuable upon the exercise of outstanding warrants with a weighted average exercise price of \$7.65 per share;

Approximately 1 million shares available for issuance under our Amended and Restated Equity Incentive Plan; 1,071,629 shares reserved for issuance pursuant to a common stock purchase agreement with Aspire Capital Fund, LLC; and

22,396,279 shares reserved for issuance upon conversion of the notes.

To the extent that outstanding options or warrants are exercised, the investor purchasing our Common Stock in this offering will experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations. To the extent that additional capital is raised through the sale of securities, the issuance of those securities could result in further dilution to our stockholders.

TABLE OF CONTENTS**MARKET PRICE OF AND DIVIDENDS ON OUR
COMMON STOCK****Market Information**

Our Common Stock is listed on NYSE MKT under the ticker symbol XTNT. From April 9, 2015 until October 19, 2015, our Common Stock traded on the OTCQX marketplace under the ticker symbol BONE, and from March 7, 2011 to April 8, 2015, our Common Stock was listed on NYSE MKT under the ticker symbol BONE. The following table sets forth the range of high and low prices per share of our Common Stock for each quarter, as reported by NYSE MKT and the OTCQX marketplace, as applicable, for the periods indicated below. Prices have been adjusted to reflect the Company's July 25, 2014 1:10 reverse stock split.

	High	Low
First Quarter 2014 (January 1, 2014 – March 31, 2014)	\$ 14.10	\$ 4.80
Second Quarter 2014 (April 1, 2014 – June 30, 2014)	\$ 8.50	\$ 6.30
Third Quarter 2014 (July 1, 2014 – September 30, 2014)	\$ 7.40	\$ 4.07
Fourth Quarter 2014 (October 1, 2014 – December 31, 2014)	\$ 4.75	\$ 2.19
First Quarter 2015 (January 1, 2015 – March 31, 2015)	\$ 4.50	\$ 2.75
Second Quarter 2015 (April 1, 2015 – June 30, 2015)	\$ 4.49	\$ 2.55
Third Quarter 2015 (July 1, 2015 – September 30, 2015)	\$ 4.49	\$ 2.70
Fourth Quarter 2015 (October 1, 2015 – December 31, 2015)	\$ 3.50	\$ 2.28
First Quarter 2016 (January 1, 2016 – March 31, 2016)	\$ 3.75	\$ 2.02
Second Quarter 2016 (April 1, 2016 – June 30, 2016)	\$ 2.72	\$ 1.51
Third Quarter 2016 (July 1, 2016 – through August 25, 2016)	\$ 1.98	\$ 1.13

Holders of Record

As of August 17, we had 216 holders of record.

Dividends

We have not paid any cash dividends and do not expect to do so in the foreseeable future. In addition, our amended and restated credit agreement with ROS precludes us from paying dividends.

TABLE OF CONTENTS

THE RIGHTS OFFERING

The Subscription Rights

We are distributing to the record holders, at no charge, non-transferable Subscription Rights to purchase one Unit at a subscription price per Unit to be determined. The Subscription Price per Unit is \$. The Subscription Price per Unit will be determined by our board of directors prior to the effectiveness of the registration statement of which this prospectus is a part. Each Basic Subscription Right will entitle you to purchase one share of our Common Stock and of a Warrant for the purchase of one additional share of our Common Stock at an exercise price of \$ per share, from the date of issuance through its expiration on . Each record holder will receive two Subscription Rights for each whole share of our Common Stock owned by such record holder as of the Record Date. Each Subscription Right entitles the record holder to a Basic Subscription Right and an Over-Subscription Privilege.

Basic Subscription Rights

Your Basic Subscription Rights will entitle you to purchase one share of our Common Stock and of a Warrant to purchase one share of our Common Stock at the exercise price described elsewhere in this prospectus. For example, if you owned 50 shares of Common Stock as of the Record Date, you will receive 100 Subscription Rights and will have the right to purchase 100 shares of our Common Stock and Warrants to purchase 100 shares of our Common Stock for \$ per whole Unit, or a total payment of \$. You may exercise all or a portion of your Basic Subscription Rights, or you may choose not to exercise any of your Basic Subscription Rights. If you do not exercise your Basic Subscription Rights in full, you will not be entitled to exercise your Over-Subscription Privilege.

Over-Subscription Privilege

If you exercise your Basic Subscription Rights in full, you may also choose to exercise your Over-Subscription Privilege. Subject to proration, if applicable, we will seek to honor the Over-Subscription Privilege requests in full. If Over-Subscription Privilege requests exceed the number of Units available, however, we will allocate the available Units pro rata among the record holders exercising the Over-Subscription Privilege in proportion to the number of shares of our Common Stock each of those record holders owned on the Record Date, relative to the number of shares owned exercising the Over-Subscription Privilege. If this pro rata allocation results in any record holder receiving a greater number of Units than the record holder subscribed for pursuant to the exercise of the Over-Subscription Privilege, then such record holder will be allocated only that number of Units for which the record holder oversubscribed, and the remaining Units will be allocated among all other record holders exercising the Over-Subscription Privilege on the same pro rata basis described above. The proration process will be repeated until all Units have been allocated.

Corporate Stock Transfer, Inc., the Subscription Agent for the Rights Offering, will determine the over-subscription allocation based on the formula described above.

To the extent the aggregate subscription payment of the actual number of unsubscribed Units available to you pursuant to the Over-Subscription Privilege is less than the amount you actually paid in connection with the exercise of the Over-Subscription Privilege, you will be allocated only the number of unsubscribed Units available to you, and any excess subscription payments will be returned to you, without interest or penalty, as soon as practicable after expiration of the Rights Offering.

We can provide no assurances that you will actually be entitled to purchase the number of Units issuable upon the exercise of your Over-Subscription Privilege in full at the expiration of the Rights Offering. We will not be able to satisfy any requests for Units pursuant to the Over-Subscription Privilege if all of our stockholders exercise their Basic Subscription Rights in full, and we will only honor an Over-Subscription Privilege to the extent sufficient Units are available following the exercise of Basic Subscription Rights.

Pre-Funded Warrants

If your subscription for Units in the Rights Offering may result in the your beneficial ownership of more than 4.99% of our outstanding Common Stock following the consummation of the Rights Offering, and you do not wish to exceed that ownership threshold, you may elect to receive a Pre-Funded Warrant to purchase one

TABLE OF CONTENTS

share of Common Stock in lieu of any share of Common Stock underlying the Units for which you have subscribed in excess of such threshold.

You may make an election to receive Pre-Funded Warrants in lieu of Common Stock, to the extent that your beneficial ownership would otherwise be above the ownership threshold. If you intend to do so, in addition to making your election on your Subscription Rights Statement, we ask that you contact the dealer-manager for the Rights Offering as follows:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

If you make an election to receive Pre-Funded Warrants but fail to timely provide the required holder information for the issuance of any Pre-Funded Warrants, you may receive the shares of Common Stock underlying all of your subscribed Units.

Limitation on the Purchase of Units

You may only purchase the number of whole Units purchasable upon exercise of the number of Basic Subscription Rights distributed to you in the Rights Offering, plus the Over-Subscription Privilege, if any. Accordingly, the number of Units that you may purchase in the Rights Offering is limited by the number of shares of our Common Stock you held on the Record Date and by the extent to which other stockholders exercise their Basic Subscription Rights and Over-Subscription Privileges, which we cannot determine prior to completion of the Rights Offering.

Subscription Price

The Subscription Price per Unit is \$. The Subscription Price per Unit will be determined by our board of directors prior to the effectiveness of the registration statement of which this prospectus is a part. The Subscription Price does not necessarily bear any relationship to our past or expected future results of operations, cash flows, current financial condition, or any other established criteria for value. No change will be made to the Subscription Price by reason of changes in the trading price of our Common Stock or other factor prior to the expiration of this Rights Offering.

Determination of Subscription Price

In the determining the Subscription Price, the board of directors may consider a variety of factors including those listed below:

- our need to raise capital in the near term to continue our operations;
- the current and historical trading prices of our Common Stock;
- our continued listing on NYSE MKT;
- a price that would increase the likelihood of participation in the Rights Offering;
- the cost of capital from other sources;
- the value of the Warrant being issued as a component of the Unit;

comparable precedent transactions, including the percentage of shares offered, the terms of the subscription rights being offered, the subscription price and the discount that the subscription price represents to the immediately prevailing closing prices for these offerings;
an analysis of stock price trading multiples for companies similar to us that, among other things, did not need to raise capital in the near-term; and

our most recently forecasted revenue relative to our peer group.

39

TABLE OF CONTENTS

The Subscription Price does not necessarily bear any relationship to any established criteria for value. No valuation consultant or investment banker has opined upon the fairness or adequacy of the Subscription Price. You should not consider the Subscription Price as an indication of actual value of the Company or our Common Stock. You should not assume or expect that, after the Rights Offering, our shares of Common Stock will trade at or above the Subscription Price in any given time period. The market price of our Common Stock may decline during or after the Rights Offering. We cannot assure you that you will be able to sell the shares of our Common Stock purchased during the Rights Offering at a price equal to or greater than the Subscription Price. You should obtain a current price quote for our Common Stock before exercising your Subscription Rights and make your own assessment of our business and financial condition, our prospects for the future, and the terms of this Rights Offering. Once made, all exercises of Subscription Rights are irrevocable.

We intend to initially have the Warrants trade on the OTCBB. If we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. There is no guarantee that the Warrants will be accepted for trading on the OTCBB or, in the future, accepted for listing on NYSE MKT. The OTCBB is an inter-dealer, over-the-counter market that provides significantly less liquidity than NYSE MKT. Securities traded on the OTCBB are usually thinly traded, highly volatile, have fewer market makers and are not followed by analysts. Therefore, prices for securities traded solely on the OTCBB may be difficult to obtain and holders of our securities may be unable to resell their securities at or near their original acquisition price, or at any price. Further, there is no assurance that the application for quotation of those securities on the OTCBB will be accepted. If the Warrants are not listed on a securities exchange or quoted on the OTCBB, you may not be able to sell those securities.

No Recombination

The Common Stock and Warrants comprising the Units will separate upon the effectiveness of the exercise of the Subscription Rights and will be issued as separate securities, and the Units will not trade as a separate security. Holders may not recombine shares of Common Stock and Warrants to receive a Unit.

Non-Transferability of Subscription Rights

The Subscription Rights are non-transferable (other than by operation of law) and, therefore, you may not sell, transfer, assign or give away your Subscription Rights to anyone. The Subscription Rights will not be listed for trading on any stock exchange or market.

Expiration Date; Extension

The subscription period, during which you may exercise your Subscription Rights, expires at 5:00 PM Eastern Time, on _____, 2016, which is the expiration of the Rights Offering. If you do not exercise your Subscription Rights before that time, your Subscription Rights will expire and will no longer be exercisable. We will not be required to issue shares to you if the Subscription Agent receives your Subscription Rights Statement or your subscription payment after that time. We have the option to extend the Rights Offering in our sole discretion, although we do not presently intend to do so. We may extend the Rights Offering by giving oral or written notice to the Subscription Agent before the Rights Offering expires. If we elect to extend the Rights Offering, we will issue a press release announcing the extension no later than 9:00 AM Eastern Time, on the next business day after the most recently announced expiration date of the Rights Offering.

If you hold your shares of Common Stock in the name of a broker, dealer, custodian bank or other nominee, the nominee will exercise the Subscription Rights on your behalf in accordance with your instructions. Please note that the nominee may establish a deadline that may be before 5:00 PM Eastern Time, on _____, 2016, which is the expiration date that we have established for the Rights Offering.

Termination

We may terminate the Rights Offering at any time and for any reason prior to the completion of the Rights Offering. If we terminate the Rights Offering, we will issue a press release notifying stockholders and the public of the termination.

40

TABLE OF CONTENTS

Return of Funds upon Completion or Termination

The Subscription Agent will hold funds received in payment for shares in a segregated account pending completion of the Rights Offering. The Subscription Agent will hold this money until the Rights Offering is completed or is terminated. To the extent you properly exercise your Over-Subscription Privilege for a number of Units that exceeds the number of unsubscribed Units available to you, any excess subscription payments will be returned to you as soon as practicable after the expiration of the Rights Offering, without interest or penalty. If the Rights Offering is terminated for any reason, all subscription payments received by the Subscription Agent will be returned as soon as practicable, without interest or penalty.

Shares of Our Common Stock Outstanding After the Rights Offering

On August 23, 2016, 12,193,970 shares of our Common Stock were outstanding. Based on the foregoing, and assuming no other transactions by us involving our Common Stock prior to the expiration of the Rights Offering, and that no Pre-Funded Warrants are issued in lieu of Common Stock, if the Rights Offering is fully subscribed approximately shares of our Common Stock will be issued and outstanding and Warrants to purchase approximately additional shares of our Common Stock will be outstanding (excluding the currently outstanding warrants). The exact number of shares of Common Stock, Warrants and Pre-Funded Warrants that we will issue in this Rights Offering will depend on the number of Units that are subscribed for in the Rights Offering and the elections of eligible investors to receive Pre-Funded Warrants.

Methods for Exercising Subscription Rights

The exercise of Subscription Rights is irrevocable and may not be cancelled or modified. You may exercise your Subscription Rights as follows:

Subscription by Record Holders

If you are a stockholder of record, the number of Units you may purchase pursuant to your Subscription Rights is indicated on the enclosed Subscription Rights Statement. You may exercise your Subscription Rights by properly completing and executing the Subscription Rights Statement and forwarding it, together with your full payment, to the Subscription Agent at the address given below under Subscription Agent, to be received before 5:00 PM Eastern Time, on _____, 2016.

Subscription by Beneficial Owners

If you are a beneficial owner of shares of our Common Stock that are registered in the name of a broker, dealer, custodian bank, or other nominee, you will not receive a Subscription Rights Statement. Instead, we will issue two Subscription Rights to such nominee record holder for each share of our Common Stock held by such nominee at the Record Date. If you are not contacted by your nominee, you should promptly contact your nominee in order to subscribe for shares in the Rights Offering and follow the instructions provided by your nominee.

To properly exercise your Over-Subscription Privilege, you must deliver the subscription payment related to your Over-Subscription Privilege before the Rights Offering expires. Because we will not know the total number of

unsubscribed Units before the Rights Offering expires, if you wish to maximize the number of shares you purchase pursuant to your Over-Subscription Privilege, you will need to deliver payment in an amount equal to the aggregate subscription payment for the maximum number of Units that you wish to purchase.

Payment Method

Payments must be made in full in U.S. currency by cashier's check or by wire transfer, and payable to Corporate Stock Transfer, Inc., as Subscription Agent for Xtant Medical Holdings, Inc. You must timely pay the full subscription payment, including payment for the Over-Subscription Privilege, for the full number of Units of our Common Stock and Warrants you wish to acquire pursuant to the exercise of Subscription Rights by delivering a:

cashier's check, drawn on a U.S. bank payable to Corporate Stock Transfer, Inc., as Subscription Agent for Xtant Medical Holdings, Inc. ; or

41

TABLE OF CONTENTS

wire transfer of immediately available funds directly to the account maintained by Corporate Stock Transfer, Inc., as Subscription Agent, for purposes of accepting subscriptions in this Rights Offering at Corporate Stock Transfer, Inc., Credit: , for further credit to Xtant Medical Holdings, Inc., and name of the Subscription Rights holder. You should read the instruction letter accompanying the Subscription Rights Statement carefully and strictly follow it. **DO NOT SEND SUBSCRIPTION RIGHTS STATEMENTS OR PAYMENTS DIRECTLY TO US.** We will not consider your subscription received until the Subscription Agent has received delivery of a properly completed and duly executed Subscription Rights Statement and payment of the full subscription amount.

The method of delivery of Subscription Rights Statements and payment of the subscription amount to the Subscription Agent will be at the risk of the holders of Subscription Rights. If sent by mail, we recommend that you send those statements and payments by registered mail, properly insured, with return receipt requested, or by overnight courier, and that you allow a sufficient number of days to ensure delivery to the Subscription Agent before the Rights Offering expires.

Missing or Incomplete Subscription Forms or Payment

If you fail to complete and sign the Subscription Rights Statement or otherwise fail to follow the subscription procedures that apply to the exercise of your Subscription Rights before the Rights Offering expires, the Subscription Agent will reject your subscription or accept it to the extent of the payment received. Neither we nor our Subscription Agent undertakes any responsibility or action to contact you concerning an incomplete or incorrect subscription form, nor are we under any obligation to correct such forms. We have the sole discretion to determine whether a subscription exercise properly complies with the subscription procedures.

If you send a payment that is insufficient to purchase the number of shares you requested, or if the number of shares you requested is not specified in the forms, the payment received will be applied to exercise your Subscription Rights to the fullest extent possible based on the amount of the payment received. Any excess subscription payments received by the Subscription Agent will be returned, without interest or penalty, as soon as practicable following the expiration of the Rights Offering.

Issuance of Common Stock and Warrants

The shares of Common Stock and Warrants that are purchased in the Rights Offering as part of the Units will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of these securities if you are a holder of record of shares. If you hold your shares of Common Stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the securities you purchased in the Rights Offering.

Any Pre-Funded Warrants that are purchased in the Rights Offering will be issued in physical form.

Subscription Agent

The Subscription Agent for the Rights Offering is Corporate Stock Transfer, Inc. The address to which Subscription Rights Statements and payments should be mailed or delivered by overnight courier is provided below. If sent by mail, we recommend that you send documents and payments by registered mail, properly insured, with return receipt requested, and that you allow a sufficient number of days to ensure delivery to the Subscription Agent before the Rights Offering expires. Do not send or deliver these materials to us.

By Mail or Hand or Overnight Courier:
Corporate Stock Transfer, Inc.
3200 Cherry Creek Drive South, Suite 430
Denver, Colorado 80209

If you deliver the Subscription Rights Statements in a manner different than that described in this prospectus, we may not honor the exercise of your Subscription Rights.

TABLE OF CONTENTS

Dealer-Manager

You should direct any questions or requests for assistance concerning the method of subscribing for the shares of our Common Stock or for additional copies of this prospectus to the dealer-manager for the Rights Offering as follows:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

No Fractional Shares

We will not issue fractional shares of Common Stock in the Rights Offering. Rights holders will only be entitled to purchase a number of Units representing a whole number of shares of Common Stock, rounded down to the nearest whole number of Units a holder would otherwise be entitled to purchase. Any excess subscription payments received by the Subscription Agent will be returned as soon as practicable after expiration of the Rights Offering, without interest or penalty. Similarly, no fractional shares of Common Stock will be issued in connection with the exercise of a Warrant or Pre-Funded Warrant. If, upon exercise of a Warrant, the holder thereof would be entitled to receive a fractional share of Common Stock, upon exercise, the holder will only be entitled to receive a whole number of shares of Common Stock, rounded down to the nearest whole number.

Notice to Brokers and Nominees

If you are a broker, dealer, bank, or other nominee holder that holds shares of our Common Stock for the account of others on the Record Date, you should notify the beneficial owners of the shares for whom you are the nominee of the Rights Offering as soon as possible to learn their intentions with respect to exercising their Subscription Rights. If a beneficial owner of our Common Stock so instructs, you should complete the Subscription Rights Statement and submit it to the Subscription Agent with the proper subscription payment by the expiration date. You may exercise the number of Subscription Rights to which all beneficial owners in the aggregate otherwise would have been entitled had they been direct holders of our Common Stock on the Record Date, provided that you, as a nominee record holder, make a proper showing to the Subscription Agent by submitting the form entitled Nominee Holder Certification, which is provided with your Rights Offering materials. If you did not receive this form, you should contact our Subscription Agent to request a copy.

Validity of Subscriptions

We will resolve all questions regarding the validity and form of the exercise of your Subscription Rights, including time of receipt and eligibility to participate in the Rights Offering. Our determination will be final and binding. Once made, subscriptions are irrevocable; we will not accept any alternative, conditional, or contingent subscriptions. We reserve the absolute right to reject any subscriptions not properly submitted or the acceptance of which would be unlawful. You must resolve any irregularities in connection with your subscriptions before the expiration date of the Rights Offering, unless we waive them in our sole discretion. Neither we nor the Subscription Agent is under any duty to notify you or your representative of defects in your subscriptions. A subscription will be considered accepted, subject to our right to withdraw or terminate the Rights Offering, only when the Subscription Agent receives a

properly completed and duly executed Subscription Rights Statement and any other required documents and the full subscription payment. Our interpretations of the terms and conditions of the Rights Offering will be final and binding.

Stockholder Rights

You will have no rights as a holder of the shares of our Common Stock you purchase in the Rights Offering until shares are issued in book-entry form or your account at your broker, dealer, bank, or other nominee is credited with the shares of our Common Stock purchased in the Rights Offering. Holders of Warrants issued in connection with the Rights Offering will not have rights as holders of our Common Stock until such Warrants are exercised and the shares of Common Stock underlying the Warrants are issued to the holder.

TABLE OF CONTENTS

Foreign Stockholders

We will not mail this prospectus or Subscription Rights Statements to stockholders with addresses that are outside the United States or that have an army post office or foreign post office address. The Subscription Agent will hold these Subscription Rights Statements for their account. To exercise Subscription Rights, our foreign stockholders must notify the Subscription Agent prior 5:00 PM Eastern Time, on _____, 2016, the third business day prior to the expiration date, of your exercise of Subscription Rights and provide evidence satisfactory to us, such as a legal opinion from local counsel, that the exercise of such Subscription Rights does not violate the laws of the jurisdiction in which such stockholder resides and payment by a U.S. bank in U.S. dollars before the expiration of the offer. If no notice is received by such time or the evidence presented is not satisfactory to us, the Subscription Rights represented thereby will expire.

No Revocation or Change

Once you submit the Subscription Rights Statement or have instructed your nominee of your subscription request, you are not allowed to revoke or change the exercise or request a refund of monies paid. All exercises of Subscription Rights are irrevocable, even if you learn information about us that you consider to be unfavorable. You should not exercise your Subscription Rights unless you are certain that you wish to purchase shares at the Subscription Price.

U.S. Federal Income Tax Treatment of Rights Distribution

For U.S. federal income tax purposes, we do not believe holders of shares of our Common Stock should recognize income or loss upon receipt or exercise of a Subscription Right. See Material U.S. Federal Income Tax Consequences on page 46.

No Recommendation to Rights Holders

Our board of directors is not making a recommendation regarding your exercise of the Subscription Rights. Stockholders who exercise Subscription Rights risk investment loss on money invested. We cannot assure you that the market price of our Common Stock will reach or exceed the Subscription Price, and even if it does so, that it will not decline during or after the Rights Offering. We also cannot assure you that you will be able to sell shares of our Common Stock or Warrants purchased in the Rights Offering at a price equal to or greater than the Subscription Price.

You should make your investment decision based on your assessment of our business and financial condition, our prospects for the future and the terms of this Rights Offering. Please see Risk Factors for a discussion of some of the risks involved in investing in our Common Stock.

Fees and Expenses

We will pay all fees charged by the Subscription Agent and by the dealer-manager. You are responsible for paying any other commissions, fees, taxes or other expenses incurred in connection with the exercise of your Subscription Rights.

Listing

The Subscription Rights may not be sold, transferred, assigned or given away to anyone, and will not be listed for trading on any stock exchange or market. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights, and if we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. The shares of our Common Stock, including the shares to be issued in the Rights Offering and the shares underlying the Warrants and any Pre-Funded Warrants to be issued in the Rights Offering, are traded on NYSE MKT under the symbol XTNT.

The Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

Important

Please follow the directions regarding delivery of Subscription Rights Statements and payments described above. Do not send Subscription Rights Statements directly to us. You are responsible for choosing the payment and delivery method for your Subscription Rights Statement and you bear the risks associated with such delivery. If you choose to deliver your Subscription Rights Statement and

TABLE OF CONTENTS

payment by mail, we recommend that you use registered mail, properly insured, with return receipt requested. We also recommend that you allow a sufficient number of days to ensure delivery to the Subscription Agent prior to the expiration time.

Distribution Arrangements

Maxim Group LLC is the dealer-manager for the Rights Offering. The dealer-manager will provide marketing assistance and advice to us in connection with the Rights Offering and will use its best efforts to solicit the exercise of Subscription Rights and participation in the Over-Subscription Privilege. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of Common Stock or Warrants to be issued in the Rights Offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of Common Stock or Warrants. We have agreed to pay the dealer-manager certain fees and to reimburse the dealer-manager for certain out-of-pocket expenses incurred in connection with this offering. See Plan of Distribution on page 58 for a discussion of the fees and expenses to be paid to the dealer-manager in connection with this Rights Offering.

TABLE OF CONTENTS

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES

The following discussion is a summary of material U.S. federal income tax consequences relating to the receipt and exercise (or expiration) of the Subscription Rights acquired through the Rights Offering and the ownership and disposition of shares of our Common Stock and Warrants received upon exercise of the Subscription Rights, Pre-Funded Warrants or Warrants.

This summary deals only with Subscription Rights acquired through the Rights Offering, shares of our Common Stock, Pre-Funded Warrants and Warrants acquired upon exercise of Subscription Rights and shares of our Common Stock acquired upon exercise of the Pre-Funded Warrants or Warrants, in each case, that are held as capital assets by a beneficial owner. This discussion does not address all aspects of U.S. federal income taxation that may be relevant to such a beneficial owner in light of their personal circumstances, including the alternative minimum tax and the Medicare contribution tax on investment income. This discussion also does not address tax consequences to holders that may be subject to special tax rules, including, without limitation, insurance companies, real estate investment trusts, regulated investment companies, grantor trusts, tax-exempt organizations, employee stock purchase plans, partnerships and other pass-through entities, persons holding Subscription Rights, shares of our Common Stock, Pre-Funded Warrants or Warrants as part of a hedging, integrated, conversion or constructive sale transaction or a straddle, financial institutions, brokers, dealers in securities or currencies, traders that elect to mark-to-market their securities, persons that acquired Subscription Rights, shares of our Common Stock, Pre-Funded Warrants or Warrants in connection with employment or other performance of services, U.S. Holders (as defined below) that have a functional currency other than the U.S. dollar, U.S. expatriates, and certain former citizens or residents of the United States. In addition, the discussion does not describe any tax consequences arising out of the tax laws of any state, local or foreign jurisdiction, or any U.S. federal tax considerations other than income taxation (such as estate, generation skipping or gift taxation).

The discussion below is based upon the provisions of the Internal Revenue Code of 1986, as amended, or the Code, the United States Treasury regulations promulgated thereunder, rulings and judicial decisions, as of the date hereof, and such authorities may be repealed, revoked or modified, perhaps retroactively. We have not sought, and will not seek, any rulings from the Internal Revenue Service, or the IRS, regarding the matters discussed below. There can be no assurance that the IRS or a court (if the matter were contested) will not take positions concerning the tax consequences of the receipt of Subscription Rights acquired through the Rights Offering by persons holding shares of our Common Stock, the exercise (or expiration) of the Subscription Rights, the acquisition, ownership and disposition of shares of our Common Stock and the acquisition, ownership and disposition (or expiration) of Pre-Funded Warrants or Warrants acquired upon exercise of the Subscription Rights that are different from those discussed below.

As used herein, a U.S. Holder means a beneficial owner of shares of our Common Stock, Subscription Rights, shares of our Common Stock, Pre-Funded Warrants and Warrants acquired upon exercise of Subscription Rights or shares of our Common Stock acquired upon exercise of Pre-Funded Warrants or Warrants, as the case may be, that is for U.S. federal income tax purposes: (1) an individual who is a citizen or resident of the United States; (2) a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States or any state thereof or the District of Columbia; (3) an estate the income of which is subject to U.S. federal income taxation regardless of its source; or (4) a trust (a) the administration of which is subject to the primary supervision of a court within the United States and one or more United States persons as described in Section 7701(a)(30) of the Code have authority to control all substantial decisions of the trust or (b) that has a valid election under the Treasury Regulations in effect to be treated as a United States person. A Non-U.S. Holder is such a

beneficial owner (other than an entity or arrangement that is treated as a partnership for U.S. federal income tax purposes) that is not a U.S. Holder.

If any entity or arrangement that is treated as a partnership for U.S. federal income tax purposes is the record owner, the U.S. federal income tax treatment of a partner generally will depend upon the status of the partner and the activities of the partnership. Holders that are partnerships (and partners in such partnerships) are urged to consult their own tax advisors.

TABLE OF CONTENTS

HOLDERS OF SHARES OF OUR COMMON STOCK SHOULD CONSULT THEIR OWN TAX ADVISORS REGARDING THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AND THE CONSEQUENCES UNDER FEDERAL ESTATE AND GIFT TAX LAWS, FOREIGN, STATE AND LOCAL LAWS AND TAX TREATIES OF THE RECEIPT, OWNERSHIP AND EXERCISE OF SUBSCRIPTION RIGHTS AND THE ACQUISITION, OWNERSHIP AND DISPOSITION OF SHARES OF OUR COMMON STOCK, PRE-FUNDED WARRANTS AND WARRANTS ACQUIRED UPON EXERCISE OF SUBSCRIPTION RIGHTS AND SHARES OF OUR COMMON STOCK ACQUIRED UPON EXERCISE OF PRE-FUNDED WARRANTS OR WARRANTS.

Tax Treatment of Pre-Funded Warrants

Any person that elects to receive Pre-Funded Warrants in lieu of our Common Stock upon the exercise of Subscription Rights should consult their own tax advisor regarding the application of the U.S. federal income tax laws to their particular situation.

Tax Consequences to U.S. Holders

Taxation of Subscription Rights

Receipt of Subscription Rights

Although the authorities governing transactions such as this Rights Offering are complex and do not speak directly to the consequences of certain aspects of this Rights Offering, including the inclusion of the right to purchase Pre-Funded Warrants and Warrants in the Subscription Rights (rather than the right to purchase only shares of our Common Stock), the distribution of Subscription Rights and the effects of the Over-Subscription Privilege, we do not believe your receipt of Subscription Rights pursuant to the Rights Offering should be treated as a taxable distribution with respect to your existing shares of Common Stock for U.S. federal income tax purposes. Pursuant to Section 305(a) of the Code, in general, the receipt by a stockholder of a right to acquire stock or warrants should not be included in the taxable income of the recipient. The general rule of non-recognition in Section 305(a) is subject to exceptions in Section 305(b), which include disproportionate distributions. A disproportionate distribution is a distribution or a series of distributions, including deemed distributions, that has the effect of the receipt of cash or other property by some stockholders and an increase in the proportionate interest of other stockholders in a corporation's assets or earnings and profits. During the last 36 months, we have not made any distributions of cash or non-stock property with respect to: (i) our Common Stock or (ii) our options or warrants to acquire Common Stock. Currently we do not intend to make any future distributions of cash or non-stock property with respect to: (i) our Common Stock or (ii) our options or warrants to acquire Common Stock; however, there is no guarantee that we will not make such distributions in the future.

Our position regarding the tax-free treatment of the Subscription Rights distribution is not binding on the IRS or the courts. If this position is finally determined by the IRS or a court to be incorrect, whether on the basis that the issuance of the Subscription Rights is a disproportionate distribution or otherwise, the fair market value of the Subscription Rights would be taxable to holders of our Common Stock as a dividend to the extent of the holder's pro rata share of our current and accumulated earnings and profits, if any, with any excess being treated as a return of capital to the extent thereof and then as capital gain. Although no assurance can be given, it is anticipated that we will not have current and accumulated earnings and profits through the end of 2016.

The following discussion is based upon the treatment of the Subscription Rights issuance as a non-taxable distribution with respect to your existing shares of Common Stock for U.S. federal income tax purposes.

Tax Basis in the Subscription Rights

If the fair market value of the Subscription Rights you receive is less than 15% of the fair market value of your existing shares of Common Stock (with respect to which the Subscription Rights are distributed) on the date you receive the Subscription Rights, the Subscription Rights will be allocated a zero dollar basis for U.S. federal income tax purposes, unless you elect to allocate your basis in your existing shares of Common Stock between your existing shares of Common Stock and the Subscription Rights in proportion to the relative fair market values of the existing shares of Common Stock and the Subscription Rights, determined on the

TABLE OF CONTENTS

date of receipt of the Subscription Rights. If you choose to allocate basis between your existing common shares and the Subscription Rights, you must make this election on a statement included with your timely filed tax return (including extensions) for the taxable year in which you receive the Subscription Rights. Such an election is irrevocable.

However, if the fair market value of the Subscription Rights you receive is 15% or more of the fair market value of your existing shares of Common Stock on the date you receive the Subscription Rights, then you must allocate your basis in your existing shares of Common Stock between those shares and the Subscription Rights you receive in proportion to their fair market values determined on the date you receive the Subscription Rights.

The fair market value of the Subscription Rights on the date that the Subscription Rights are distributed is uncertain, and we have not obtained, and do not intend to obtain, an appraisal of the fair market value of the Subscription Rights on that date. In determining the fair market value of the Subscription Rights, you should consider all relevant facts and circumstances, including any difference between the Subscription Price of the Subscription Rights and the trading price of our shares of Common Stock on the date that the Subscription Rights are distributed, the exercise price of the Warrants, the length of the period during which the Subscription Rights may be exercised and the fact that the Subscription Rights are non-transferable.

Exercise of Subscription Rights

Generally, you will not recognize gain or loss upon the effectiveness of the exercise of a Subscription Right in the Rights Offering. Your adjusted tax basis, if any, in the Subscription Right plus the Subscription Price should be allocated between the new Common Stock and Warrant acquired upon exercise of the Subscription Right. The basis in the stock upon which the Subscriptions Rights were issued which is allocated to the Subscription Rights under the prior section entitled *Tax Basis in the Subscription Rights* would be further allocated between the new Common Stock and the Warrant acquired upon exercise of the Subscription Right in proportion to their relative fair market values on the date the Subscription Rights were distributed. The Subscription Price should be allocated between the new Common Stock and Warrant acquired upon exercise of the Subscription Right in proportion to their relative fair market values on the exercise date. These allocations will establish your initial tax basis for U.S. federal income tax purposes in your new Common Stock and Warrants. The holding period of shares of Common Stock or a Warrant acquired upon exercise of a Subscription Right in the Rights Offering will begin on the date of exercise.

If you exercise a Subscription Right received in the Rights Offering after disposing of the shares of our Common Stock with respect to which such Subscription Right is received, then certain aspects of the tax treatment of the exercise of the Subscription Right are unclear, including (1) the allocation of the tax basis between the shares of Common Stock previously sold and the Subscription Right, (2) the impact of such allocation on the amount and timing of gain or loss recognized with respect to the shares of our Common Stock previously sold and (3) the impact of such allocation on the tax basis of the shares of our Common Stock and Warrants acquired upon exercise of the Subscription Right. If you exercise a Subscription Right received in the Rights Offering after disposing of shares of our Common Stock with respect to which the Subscription Right is received, you should consult with your own tax advisor.

Expiration of Subscription Rights

If you allow Subscription Rights received in the Rights Offering to expire, you should not recognize any gain or loss for U.S. federal income tax purposes, and you should re-allocate any portion of the tax basis in your existing Common Stock previously allocated to the Subscription Rights that have expired to the existing Common Stock.

Taxation of Warrants

Sale, Exchange, Redemption or other Taxable Disposition of Warrants

Upon the sale, exchange, redemption or other taxable disposition of a Warrant, in general, you will recognize taxable gain or loss measured by the difference, if any, between (i) the amount of cash and the fair market value of any property received upon such taxable disposition and (ii) your adjusted tax basis in the Warrant as determined pursuant to the rules discussed above. Your gain or loss generally will be capital gain or loss and

48

TABLE OF CONTENTS

generally will be long-term capital gain or loss if, at the time of the sale or other disposition, your holding period for the Warrant is more than one year. The deductibility of capital losses is subject to limitations.

Exercise of Warrants

Upon the exercise of a Warrant by paying the exercise price in cash, in general, you will not recognize gain or loss for U.S. federal income tax purposes, except to the extent you receive a cash payment for any such fractional share that would otherwise have been issuable upon exercise of the Warrant. Your initial tax basis in Common Stock received will equal your adjusted tax basis in the Warrant exercised (as determined pursuant to the rules discussed above), increased by the amount of cash paid to exercise the Warrant and decreased by the adjusted tax basis allocable to any fractional share that would otherwise have been issuable upon exercise of the Warrant. Your holding period for the shares of our Common Stock received on exercise generally will commence on the day of exercise.

In certain circumstances, namely during any period when a registration statement for the exercise of the Warrants is not in effect, the Warrants will be exercisable on a cashless basis. The tax consequences of a cashless exercise are not clear and could differ from the consequences described above, including the possibility that a cashless exercise could be a taxable event. You should consult your own tax advisor regarding the tax consequences of a cashless exercise of a Warrant.

Expiration of Warrants

If you allow a Warrant to expire, you will generally recognize a loss for U.S. federal income tax purposes equal to your adjusted tax basis in the Warrant. In general, such a loss will be a capital loss and will be a short-term or long-term capital loss depending on your holding period for the Warrant.

Certain Adjustments to the Warrants

Under Section 305 of the Code, an adjustment to the number of common shares that will be issued on the exercise of the Warrants, or an adjustment to the exercise price of the Warrants, may be treated as a constructive distribution to you if, and to the extent that, such adjustment has the effect of increasing your proportionate interest in our earnings and profits or assets, depending on the circumstances of such adjustment (for example, if such adjustment is to compensate for a distribution of cash or other property to our stockholders). Adjustments to the exercise price of Warrants made pursuant to a bona fide reasonable adjustment formula that has the effect of preventing dilution of the interest of the holders of the Warrants should generally not be considered to result in a constructive distribution. Any such constructive distribution would be taxable whether or not there is an actual distribution of cash or other property.

See the more detailed discussion of the rules applicable to distributions made by us under the heading **Taxation of Common Stock Distributions** below.

Taxation of Common Stock

Distributions

Distributions with respect to shares of our Common Stock acquired upon exercise of Subscription Rights or upon exercise of Warrants will be taxable as dividend income when actually or constructively received to the extent of our current or accumulated earnings and profits as determined for U.S. federal income tax purposes.

Dividend income received by certain non-corporate U.S. Holders with respect to shares of our Common Stock

generally will be qualified dividends subject to preferential rates of U.S. federal income tax, provided that the U.S. Holder meets applicable holding period and other requirements. Subject to similar exceptions for short-term and hedged positions, dividend income on our shares of Common Stock paid to U.S. Holders that are domestic corporations generally will qualify for the dividends-received deduction. To the extent that the amount of a distribution exceeds our current and accumulated earnings and profits, such distribution will be treated first as a tax-free return of capital to the extent of your adjusted tax basis in such shares of our Common Stock and thereafter as capital gain.

Dispositions

If you sell or otherwise dispose of shares of Common Stock acquired upon exercise of Subscription Rights or upon exercise of Warrants in a taxable transaction, you will generally recognize capital gain or loss equal to the difference between the amount realized and your adjusted tax basis in the shares. Such capital gain or loss

TABLE OF CONTENTS

will be long-term capital gain or loss if your holding period for such shares is more than one year at the time of disposition. Long-term capital gain of a non-corporate U.S. Holder is generally taxed at preferential rates of U.S. federal income tax. The deductibility of capital losses is subject to limitations.

Information Reporting and Backup Withholding

You may be subject to information reporting and/or backup withholding with respect to the gross proceeds from the disposition of Warrants, shares of our Common Stock acquired through the exercise of Subscription Rights or through the exercise of Warrants, or dividend payments. Backup withholding (currently at the rate of 28%) may apply under certain circumstances if you (1) fail to furnish your social security or other taxpayer identification number, or TIN, (2) furnish an incorrect TIN, (3) fail to report interest or dividends properly or (4) fail to provide a certified statement, signed under penalty of perjury, that the TIN provided is correct, that you are not subject to backup withholding and that you are a U.S. person for U.S. federal income tax purposes on IRS Form W-9. Any amount withheld from a payment under the backup withholding rules is allowable as a credit against (and may entitle you to a refund with respect to) your U.S. federal income tax liability, provided that the required information is timely furnished to the IRS. Certain persons are exempt from information reporting and backup withholding, including corporations and certain financial institutions, provided that they demonstrate this fact, if requested. You are urged to consult your own tax advisor as to your qualification for exemption from backup withholding and the procedure for obtaining such exemption.

Tax Consequences to Non-U.S. Holders

Taxation of the Subscription Rights

Receipt, Exercise and Expiration of the Subscription Rights

The discussion below assumes that the receipt of Subscription Rights will be treated as a non-taxable distribution. See Tax Consequences to U.S. Holders Taxation of Subscription Rights Receipt of Subscription Rights above.

Exercise and Expiration of Warrants and Certain Adjustments to Warrants

Exercise of Warrants

In general, a Non-U.S. Holder will not recognize gain or loss for U.S. federal income tax purposes upon exercise of a Warrant, except to the extent the Non-U.S. Holder receives a cash payment for any such fractional share that would otherwise have been issuable upon exercise of the Warrant, which will be treated as a sale subject to the rules described under Sale or Other Disposition of our Common Stock or Warrants below.

Expiration of Warrants

In general, a Non-U.S. Holder will not be able to utilize a loss recognized upon expiration of a Warrant against the Non-U.S. Holder's U.S. federal income tax liability unless the loss is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if an income tax treaty so provides, is attributable to a permanent establishment in the United States) or is treated as a U.S.-source loss and the Non-U.S. Holder is present 183 days or more in the taxable year of disposition and certain other conditions are met.

Certain Adjustments to the Warrants

Under Section 305 of the Code, an adjustment to the number of common shares that will be issued on the exercise of the Warrants, or an adjustment to the exercise price of the Warrants, may be treated as a constructive distribution to a Non-U.S. Holder of the Warrants if, and to the extent that, such adjustment has the effect of increasing such Non-U.S.

Holder's proportionate interest in our earnings and profits or assets, depending on the circumstances of such adjustment (for example, if such adjustment is to compensate for a distribution of cash or other property to our stockholders). Adjustments to the exercise price of Warrants made pursuant to a bona fide reasonable adjustment formula that has the effect of preventing dilution of the interest of the holders of the Warrants should generally not be considered to result in a constructive distribution. Any such constructive distribution would be taxable whether or not there is an actual distribution of cash or other property. See the more detailed discussion of the rules applicable to distributions made by us under the heading "Taxation of Distributions on Common Stock" below.

TABLE OF CONTENTS

Taxation of Distributions on Common Stock

Any distributions of cash or property (including any adjustments to the Warrants described in the immediately preceding paragraph) made with respect to our Common Stock generally will be subject to withholding tax to the extent paid out of our current or accumulated earnings and profits as determined for U.S. federal income tax purposes, if any, at a rate of 30% (or a lower rate prescribed by an applicable income tax treaty). In order to obtain a reduced withholding tax rate, if applicable, you will be required to provide a properly completed IRS Form W-8BEN or IRS Form W-8BEN-E, as applicable, certifying your entitlement to benefits under a treaty. In addition, you will not be subject to withholding tax if you provide an IRS Form W-8ECI certifying that the distributions are effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, are attributable to a permanent establishment within the United States); instead, you generally will be subject to U.S. federal income tax, net of certain deductions, with respect to such income at the same rates applicable to U.S. persons. If you are a corporation, a branch profits tax of 30% (or a lower rate prescribed by an applicable income tax treaty) also may apply to such effectively connected income.

Non-U.S. Holders may be required to periodically update their IRS Forms W-8.

Any distribution will also be subject to the discussion below under the headings Information Reporting and Backup Withholding and FATCA.

Sale or Other Disposition of Our Common Stock or Warrants

Subject to the discussion below regarding backup withholding and FATCA, you generally will not be subject to U.S. federal income tax on any gain realized on a sale or other disposition of shares of our Common Stock or Warrants unless:

the gain is effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, is attributable to a permanent establishment in the United States); you are an individual, you hold your Subscription Rights, shares of Common Stock or Warrants as capital assets, you are present in the United States for 183 days or more in the taxable year of disposition and certain other conditions are met (in which case you will be subject to a 30% tax, or such lower rate as may be specified by an applicable income tax treaty, on the net gain derived from the disposition, which may be offset by your U.S.-source capital losses, if any); or we are or have been a United States real property holding corporation, or USRPHC, for U.S. federal income tax purposes unless an exception for 5% or less stockholders applies.

Gain that is effectively connected with your conduct of a trade or business within the United States (and, if an applicable income tax treaty so provides, is attributable to a permanent establishment within the United States) generally will be subject to U.S. federal income tax, net of certain deductions, at the same rates applicable to U.S. persons. If you are a corporation, a branch profits tax of 30% (or a lower rate prescribed in an applicable income tax treaty) also may apply to such effectively connected gain.

A domestic corporation is treated as a USRPHC if the fair market value of its United States real property interests equals or exceeds 50% of the sum of (1) the fair market value of its United States real property interests, (2) the fair market value of its non-United States real property interests and (3) the fair market value of any other of its assets which are used or held for use in a trade or business. We believe that we are not currently, and have not been within the relevant testing period, a USRPHC. However, no assurance can be given that we will not become a USRPHC in the future. If we are a USRPHC or become a USRPHC in the future, a Non-U.S. Holder may still not be subject to

U.S. federal income tax on a sale or other disposition if an exception for 5% or less stockholders applies. You are urged to consult your own tax advisor regarding the U.S. federal income tax considerations that could result if we are, or become, a USRPHC and with respect to the exception for 5% or less stockholders.

Information Reporting and Backup Withholding

Distributions on our Common Stock and the amount of tax withheld, if any, with respect to such distributions will generally be subject to information reporting. If you comply with certification procedures to establish that

TABLE OF CONTENTS

you are not a United States person, additional information reporting and backup withholding should not generally apply to distributions on our Common Stock and information reporting and backup withholding should not generally apply to the proceeds from a sale or other disposition of Warrants or shares of our Common Stock. Generally, a Non-U.S. Holder will comply with such procedures if it provides a properly executed IRS Form W-8BEN or W-8BEN-E, as applicable, (or other applicable IRS Form W-8) or otherwise meets documentary evidence requirements for establishing that it is a Non-U.S. Holder, or otherwise establishes an exemption. The amount of any backup withholding will generally be allowed as a refund or credit against your U.S. federal income tax liability, provided that the required information is timely furnished to the IRS.

FATCA

Payments of dividends on our Common Stock to a Non-U.S. Holder will be subject to a 30% withholding tax if the Non-U.S. Holder fails to provide the withholding agent with documentation sufficient to show that it is compliant with FATCA. Generally such documentation is provided on an executed and properly completed IRS Form W-8BEN or IRS Form W-8BEN-E, as applicable. If dividends are subject to the 30% withholding tax under FATCA, they will not be subject to the 30% withholding tax described above under Tax Consequences to Non-U.S. Holders Taxation of Distributions on Common Stock. Starting in 2019, payments of the gross proceeds from a sale or exchange of our Common Stock or other securities may also be subject to FATCA withholding absent proof of FATCA compliance prior to January 1, 2019.

THE PRECEDING DISCUSSION OF MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES IS NOT TAX ADVICE. HOLDERS OF SUBSCRIPTION RIGHTS, SHARES OF OUR COMMON STOCK SHOULD CONSULT THEIR OWN TAX ADVISORS REGARDING THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AND THE CONSEQUENCES UNDER FEDERAL ESTATE AND GIFT TAX LAWS, FOREIGN, STATE AND LOCAL LAWS AND TAX TREATIES OF THE RECEIPT, OWNERSHIP AND EXERCISE OF SUBSCRIPTION RIGHTS AND THE ACQUISITION, OWNERSHIP AND DISPOSITION OF SHARES OF OUR COMMON STOCK, PRE-FUNDED WARRANTS AND WARRANTS ACQUIRED UPON EXERCISE OF SUBSCRIPTION RIGHTS AND SHARES OF OUR COMMON STOCK ACQUIRED UPON EXERCISE OF PRE-FUNDED WARRANTS OR WARRANTS.

TABLE OF CONTENTS

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. For the complete terms of our Common Stock and preferred stock, please refer to our Restated Certificate of Incorporation and Amended and Restated Bylaws that are filed as exhibits to our reports incorporated by reference into the registration statement that includes this prospectus. The Delaware General Corporation Law may also affect the terms of our Common Stock and preferred stock.

Authorized and Outstanding Capital Stock

Our Restated Certificate of Incorporation provides that we have authority to issue (i) 95,000,000 shares of Common Stock, par value \$0.000001 per share, 12,193,970 of which are issued and outstanding as of August 23, 2016, and (ii) 5,000,000 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 August 23, 2016, we also had outstanding warrants to purchase approximately 1,278,566 shares of our Common Stock and 1,400,000 shares authorized for issuance under our Amended and Restated Equity Incentive Plan.

Common Stock

Principal Market for our Common Stock

Our Common Stock is listed on NYSE MKT under the symbol XTNT.

Dividends

Our board of directors may authorize, and we may make, distributions to our stockholders, subject to any restriction in our Restated 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 our board of directors may determine to issue from time to time. However, we have never paid cash dividends on our Common Stock or any other securities. We anticipate that we will retain all of our future earnings, if any, for use in the expansion and operation of our business and do not anticipate paying any cash dividends in the foreseeable future.

Fully Paid and Non-Assessable

All shares of our outstanding Common Stock are fully paid and non-assessable.

Voting Rights

Each share of our Common Stock is entitled to one vote in 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 for directors. Our stockholders may vote either in person or by proxy. Except in respect of matters relating to the election of directors and as otherwise provided in our Restated Certificate of Incorporation or required by law, all matters to be voted on by our stockholders must be approved by holders of a majority of the shares present in person

or by proxy at the meeting and entitled to vote on the subject matter. In the case of election of directors, all matters to be voted on by our stockholders must be approved by a plurality of the votes entitled to be cast by holders of all outstanding shares of Common Stock.

Preemptive and Other Rights

Holders of our Common Stock have no preemptive rights and have no other rights to subscribe for additional securities of ours under Delaware law, nor does our Common Stock have any conversion rights or rights of redemption. Upon liquidation, all holders of our Common Stock are entitled to participate pro rata in our assets available for distribution, subject to the rights of any class of preferred stock then outstanding.

Preferred Stock

Though we currently have no plans to issue any shares of preferred stock, our board of directors has the authority, without further action by our stockholders, to designate and issue up to 5,000,000 shares of preferred stock in one or more series. Our board of directors may also designate the rights, preferences and

TABLE OF CONTENTS

privileges of the holders of each such series of preferred stock, any or all of which may be greater than or senior to those granted to the holders of Common Stock. Though the actual effect of any such issuance on the rights of the holders of Common Stock will not be known until our board of directors determines the specific rights of the holders of preferred stock, the potential effects of such an issuance include:

diluting the voting power of the holders of Common Stock;
reducing the likelihood that holders of Common Stock will receive dividend payments;
reducing the likelihood that holders of Common Stock will receive payments in the event of our liquidation, dissolution or winding up; and
delaying, deterring or preventing a change in control or other corporate takeover.

Warrants

Warrants Included in Units Issuable in the Rights Offering

The Warrants to be issued as a part of this Rights Offering will be separately transferable following their issuance and through their expiration _____ years from the date of issuance. The Warrants entitle the holder to purchase one share of Common Stock at an exercise price of \$ _____ per share, from the date of issuance through its expiration on _____, 2021. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights, and if we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. The Common Stock underlying the Warrants, upon issuance, will also be traded on NYSE MKT under the symbol XTNT.

All Warrants that are purchased in the Rights Offering as part of the Units will be issued in book-entry, or uncertificated, form meaning that you will receive a direct registration (DRS) account statement from our transfer agent reflecting ownership of Warrants if you are a holder of record of shares. The Subscription Agent will arrange for the issuance of the Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected. If you hold your shares of Common Stock in the name of a custodian bank, broker, dealer, or other nominee, DTC will credit your account with your nominee with the Warrants you purchased in the Rights Offering.

The Warrants will be exercisable by paying the exercise price in cash, or, solely during any period when a registration statement for the exercise of the Warrants is not in effect, exercisable on a cashless basis.

The exercise price of the Warrants and the number of shares of Common Stock issuable upon exercise of the Warrants are subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the Common Stock.

Except as described below, a holder may not exercise any portion of the Warrant to the extent that the holder would beneficially own more than 4.99% of our outstanding Common Stock after exercise, except that upon at least 61 days prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder's Warrants up to 9.99% of the number of shares of our Common Stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the Warrants. The foregoing limitation on exercise does not apply to any holder who beneficially owns in excess of 4.99% of our outstanding Common Stock immediately prior to the Rights Offering.

No public market currently exists for the Warrants. We will seek to have the Warrants trade on the OTCBB promptly after the expiration of the Subscription Rights, and if we regain compliance with NYSE MKT minimum listing criteria and the Warrants are eligible for listing on NYSE MKT, we intend to apply to list the Warrants on NYSE MKT. Even if the Warrants are listed on NYSE MKT, an active public market for the Warrants may not be developed or sustained.

Without an active trading market, the liquidity of the Warrants will be limited.

TABLE OF CONTENTS

Subject to applicable laws and the restriction on transfer set forth in the Warrant, the Warrant may be transferred at the option of the holder upon surrender of the Warrant to us together with the appropriate instruments of transfer.

After the one-year anniversary of issuance, we may redeem the Warrants for \$0.01 per Warrant if our Common Stock is above \$ per share, for each of 10 consecutive trading days.

The Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company. Upon notice to the Warrants holders, we have the right at any time and from time to time, to reduce the exercise price or to extend the Warrants termination date.

The Warrants will be issued pursuant to a warrant agreement by and between us and Corporate Stock Transfer, Inc., as the warrant agent.

Pre-Funded Warrants Issuable in Lieu of Common Stock in the Rights Offering

Any Pre-Funded Warrants issued as a part of this Rights Offering will be separately transferable following their issuance and through their expiration 12 years from the date of issuance. The Pre-Funded Warrants entitle the holder to purchase one share of Common Stock at an exercise price of \$0.01 per share, and the subscription price per Unit for any such electing investors will be \$ (which equals the Subscription Price for the other Units sold in the Rights Offering, less the \$0.01 exercise price for each Pre-Funded Warrant). Each Pre-Funded Warrant will be exercisable from the date of issuance through its expiration 12 years after the date of issuance. The Pre-Funded Warrants will not be listed for trading on any stock exchange or market.

Any Pre-Funded Warrants that are purchased in the Rights Offering as part of the Units will be issued in physical form. The Subscription Agent will arrange for the issuance of the Pre-Funded Warrants as soon as practicable after the expiration of the Rights Offering, payment for the Units subscribed for has cleared, and all prorating calculations and reductions contemplated by the terms of the Rights Offering have been effected.

The Pre-Funded Warrants will be exercisable by paying the exercise price in cash or on a cashless basis. The exercise price of the Pre-Funded Warrants and the number of shares of Common Stock issuable upon exercise of the Pre-Funded Warrants are subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the Common Stock.

A holder may not exercise any portion of the Pre-Funded Warrant to the extent that the holder would beneficially own more than 4.99% of our outstanding Common Stock after exercise, except that upon at least 61 days prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder's Pre-Funded Warrant up to 9.99% of the number of shares of our Common Stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the Pre-Funded Warrant.

Subject to applicable laws, the Pre-Funded Warrants may be offered for sale, sold, transferred or assigned without our consent.

The Pre-Funded Warrants do not confer upon the holder any voting or any other rights of a stockholder of the Company.

Anti-Takeover Provisions

Certificate of Incorporation and Bylaws

Our board of directors is divided into three classes, the members of each of which serve for staggered three-year terms. Our stockholders may elect only one-third of our board of directors each year. Because our stockholders do not have cumulative voting rights, our stockholders holding a majority of the shares of Common Stock outstanding will be able to elect all of our directors. Our Amended and Restated Bylaws provide that only our board of directors, Chairman of the board or Chief Executive Officer may call a special meeting of stockholders.

TABLE OF CONTENTS

The combination of these factors will make it more difficult for our existing stockholders to replace our board of directors as well as for another party to obtain control of us by replacing our board of directors. Since our board of directors has the power to retain and discharge our officers, these provisions could also make it more difficult for existing stockholders or another party to effect a change in management. In addition, these provisions may have the effect of deterring hostile takeovers or delaying changes in our control or management. These provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal. The provisions also are intended to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our stock and, as a consequence, they also may inhibit fluctuations in the market price of our stock that could result from actual or rumored takeover attempts.

Section 203 of the Delaware General Corporation Law

We have elected to be subject to Section 203 of the Delaware General Corporation Law (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.

TABLE OF CONTENTS

Limitations of Liability and Indemnification Matters

We have adopted provisions in our Restated 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 the 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 Delaware General Corporation Law; 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 Amended and Restated Bylaws provide for mandatory indemnification of directors and officers to the maximum extent allowed by applicable law. We believe that indemnification under our Amended and Restated 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 the Company 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.

Transfer Agent

The transfer agent for our Common Stock is Corporate Stock Transfer, Inc.

TABLE OF CONTENTS

PLAN OF DISTRIBUTION

On or about _____, 2016, we will distribute the Subscription Rights, Subscription Rights Statements and copies of this prospectus to the holders of our Common Stock on the Record Date. Subscription Rights holders who wish to exercise their Subscription Rights and purchase Units must complete the Subscription Rights Statement and return it with payment for the shares to the Subscription Agent at the following address:

By Mail or Hand or Overnight Courier:
Corporate Stock Transfer, Inc.
3200 Cherry Creek Drive South, Suite 430
Denver, Colorado 80209

See The Rights Offering Methods for Exercising Subscription Rights.

If you have any questions, you should contact the dealer-manager for the Rights Offering:

Maxim Group LLC
405 Lexington Avenue
New York, New York 10174
Attention Syndicate Department
Email: syndicate@maximgrp.com
Telephone: (212) 895-3745

Other than as described in this prospectus, we do not know of any existing agreements between any stockholder, broker, dealer, underwriter or agent relating to the sale or distribution of the underlying Common Stock.

Maxim Group LLC is the dealer-manager of this Rights Offering. We and Maxim may introduce one or more co-dealer-managers and one or more financial advisors to assist in the Rights Offering. In any such event, Maxim Group LLC will be the lead dealer-manager. In such capacity, the dealer-manager will provide marketing assistance and advice to us in connection with this offering and will solicit the exercise of Subscription Rights and participation in the Over-Subscription Privilege. The dealer-manager is not underwriting or placing any of the Subscription Rights or the Units, shares of Common Stock, Warrants or Pre-Funded Warrants being issued in this offering, and does not make any recommendation with respect to such Subscription Rights (including with respect to the exercise or expiration of such Subscription Rights), Units, shares of Common Stock, Warrants or Pre-Funded Warrants.

In connection with this Rights Offering, we have agreed to pay to the dealer-manager a cash fee equal to 7% of the gross proceeds received by us directly from exercises of Subscription Rights. We have also provided to the dealer-manager a non-accountable expense allowance of \$75,000 for expenses incurred in connection with the Rights Offering. We advanced \$30,000 of this \$75,000 allowance to Maxim Group LLC upon its engagement as a dealer-manager; provided that Maxim Group LLC will promptly reimburse to us any portion of the advance not used for actual out-of-pocket expenses.

From the Record Date until 90 days after the closing of the Rights Offering, we have agreed not to issue, agree to issue or announce the issuance of any shares of Common Stock or common stock equivalents without the consent of the dealer-manager, subject to certain exceptions including a pre-existing agreement, equity awards, conversion of derivative securities and in connection with any acquisitions, partnerships or strategic transactions.

We have also agreed to indemnify the dealer-manager and its respective affiliates against certain liabilities arising under the Securities Act. The dealer-manager's participation in this offering is subject to customary conditions contained in the dealer-manager agreement, including the receipt by the dealer-manager of an opinion of our counsel. The dealer-manager and its affiliates may provide to us from time to time in the future in the ordinary course of their business certain financial advisory, investment banking and other services for which they will be entitled to receive fees.

Maxim Group LLC is a broker-dealer and member of the Financial Industry Regulatory Authority, Inc. The principal business address of Maxim Group LLC is 405 Lexington Avenue, New York, New York 10174.

TABLE OF CONTENTS

LEGAL MATTERS

The validity of the issuance of the Common Stock offered in this offering was passed upon for us by Ballard Spahr LLP.

EXPERTS

The financial statements for the years ended December 31, 2015 and 2014 incorporated by reference into this prospectus and registration statement have been audited by EKS&H LLLP, an independent registered public accounting firm, as set forth in their report thereon appearing in our Annual Report on Form 10-K for the year ended December 31, 2015 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 that we have filed with the SEC:

our Annual Report on Form 10-K for the year ended December 31, 2015, filed on March 24, 2016;
our Quarterly Report on Form 10-Q for the quarters ended March 31, 2016, and June 30, 2016, filed on May 11, 2016, and August 10, 2016, respectively;

Our definitive proxy statement on Schedule 14A, filed with the SEC on May 26, 2016;
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 January 22, 2016, April 4, 2016, April 19, 2016, May 31, 2016, June 17, 2016, August 2, 2016, August 16, 2016 and August 19, 2016;
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, or the Exchange Act, after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement; and
all documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act on or after the date of this prospectus and before we stop offering the securities under this prospectus.

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

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

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

TABLE OF CONTENTS

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement 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 read and copy this information and the registration statement at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for more information about the operation of the public reference room.

You may also obtain the documents that we file electronically on the SEC's website at www.sec.gov or on our website at www.xtantmedical.com. Information contained on our website is not incorporated by reference herein and does not constitute part of this prospectus.

TABLE OF CONTENTS

XTANT MEDICAL HOLDINGS, INC.

PROSPECTUS

**Subscription Rights to Purchase Up to Units
Consisting of an Aggregate of Up to Shares of
Common Stock
and Warrants to Purchase Up to Shares of Common
Stock
at a Subscription Price of \$ Per Unit**

Dealer-Manager

Maxim Group LLC

, 2016

TABLE OF CONTENTS**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 the common stock being registered. All the amounts shown are estimates except the SEC registration fee.

	Amount to be paid
SEC registration fee	\$ 1,511
Printing expenses	\$ 5,000
Accounting fees and expenses	\$ 10,000
Legal fees and expenses	\$ 200,000
Miscellaneous	\$ 3,000
Total	\$ 219,511

Item 14. Indemnification of Directors and Officers.**Delaware General Corporation Law**

Section 145(a) of the General Corporation Law of the State of Delaware, (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.

II-1

TABLE OF CONTENTS

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 Amended and Restated Certificate of Incorporation that limit director liability to the maximum extent permitted under the DGCL.

Bylaws

The Company's Amended and Restated 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 an insurance policy that purports 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 Amended and Restated Certificate of Incorporation, Amended and Restated 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.

II-2

TABLE OF CONTENTS

Item 15. Recent Sales of Unregistered Securities

Aspire Capital Transaction

On April 17, 2015, the Company entered into an Amended and Restated Common Stock Purchase Agreement (the Purchase Agreement) with Aspire Capital Fund, LLC, an Illinois limited liability company (Aspire Capital), which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of \$10.0 million of shares of the Company's Common Stock (the Purchase Shares) over the 24-month term of the Purchase Agreement. Pursuant to the terms of the Purchase Agreement, we issued 207,182 shares of our Common Stock (the Initial Purchase Shares) to Aspire Capital for \$750,000 in aggregate proceeds. We also issued 154,189 shares of our Common Stock to Aspire Capital as a commitment fee (the Commitment Shares). Subsequent to the issuance of the Initial Purchase Shares and the Commitment Shares, pursuant to the Purchase Agreement, we issued 417,000 shares of our Common Stock to Aspire Capital for \$1,387,439 in aggregate proceeds.

The Purchase Shares may be sold by the Company to Aspire Capital on any business day the Company selects in two ways: (1) through a regular purchase of up to 50,000 shares at a known price based on the market price of our Common Stock prior to the time of each sale, and (2) through a volume-weighted average price purchase of a number of shares up to 30% of the volume traded on the purchase date at a price equal to the lesser of the closing sale price or 97% of the volume-weighted average price for such purchase date.

The issuance of the Initial Purchase Shares, the Commitment Shares and all other shares of Common Stock that have been or may be issued from time to time to Aspire Capital under the Purchase Agreement is exempt from registration under the Securities Act, pursuant to the exemption for transactions by an issuer not involving any public offering under Section 4(a)(2) of the Securities Act.

Other Sales of Unregistered Securities

In addition to the shares we recently issued to Aspire Capital pursuant to the Purchase Agreement, during the past three years, we issued unregistered securities as outlined below, in reverse chronological order. 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. Share amounts and prices per share have been adjusted to reflect our July 25, 2014 1:10 reverse stock split.

Issuances of Capital Stock

- (1) On September 4, 2015, we issued 140,053 shares of our Common Stock to certain directors for aggregate proceeds of \$515,395.
- (2) On July 31, 2015, in connection with our acquisition of X-spine, we issued 4,242,655 shares of our Common Stock at an assumed value of \$4.00 per share to the owners of the issued and outstanding shares of X-spine's capital stock.
- (3) On September 5, 2014, we issued 4,000 shares of our Common Stock to Cameron Beckman in exchange for a release to settle a claim.
On March 11, 2014, we issued 150,000 shares of our Common Stock to Royalty Opportunities S.à.r.l. as consideration for the Sixth Amendment to our credit agreement with ROS Acquisition Offshore LP (ROS) whereby we borrowed an additional \$4 million under our credit agreement.
- (5) On November 25, 2013, we issued 150,000 shares of our Common Stock to Royalty Opportunities S.à.r.l. as consideration for a Waiver and Fifth Amendment to our credit agreement with ROS whereby ROS (i) waived our

failure to achieve the revenue required by Section 8.4.1 of our credit agreement for the quarter ended September 30, 2013 and (ii) agreed to reduce our future revenue requirements.

(6) On June 10, 2013, we issued 850,877 shares of our Common Stock to accredited investors pursuant to Rule 506 of Regulation D at a price of \$5.70 per share, along with warrants to purchase 425,438 shares of our Common Stock at an exercise price of \$7.20 per share, for aggregate gross proceeds of \$4.85 million. William Blair & Company, LLC served as sole placement agent for the transaction and received a commission of approximately \$400,000.

II-3

TABLE OF CONTENTS

Convertible Note Financing

- (7) On April 14, 2016, we issued in a private placement to the OrbiMed purchasers an aggregate principal amount of approximately \$2.2 million of 6.00% convertible senior promissory notes due 2021.
- (8) On July 31, 2015, we issued 6.00% convertible senior unsecured notes due 2021 (Notes) to qualified institutional buyers for an aggregate principal amount of \$65 million, and on August 13, 2015, we issued additional Notes in the aggregate principal amount of \$3 million pursuant to the initial purchaser's partial exercise of its overallotment option.

Grants of Stock Options

- (9) On July 1, 2014, we issued an option to purchase 55,000 shares of our Common Stock at \$6.80 per share to our former President, Robert Di Silvio, outside of our Amended and Restated Equity Incentive Plan.
- (10) On August 14, 2013, we issued an option to purchase 200,000 shares of our Common Stock at \$6.00 per share to our Chief Executive Officer, Daniel Goldberger, outside of our Amended and Restated Equity Incentive Plan.

Item 16. Exhibits and Financial Statement Schedules

(a) Exhibits

See the Exhibit Index on the page immediately preceding the exhibits for a list of exhibits filed as part of this registration statement on Form S-1, which Exhibit Index is incorporated herein by reference.

(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

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the provisions described under Item 14 above, 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 Securities 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 Securities Act and will be governed by the final adjudication of such issue.

(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;
- (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 Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the Calculation of Registration Fee table in the effective registration statement; and

II-4

TABLE OF CONTENTS

- (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.
That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment
 - (2) 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.
That, for the purpose of determining liability under the Securities Act to any purchaser: if the registrant is subject to Rule 430C (§230.430C of this chapter), each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A (§230.430A of this chapter), shall be deemed to be part of and included in the
 - (4) registration statement as of the date it is first used after effectiveness; provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.
That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities
 - (5) of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:
 - (i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424 (§230.424 of this chapter);
 - (ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
 - (iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
 - (iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.
- 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.

II-5

TABLE OF CONTENTS

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 (c) 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.

(d) The undersigned registrant hereby undertakes that:

For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form (1) of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b) (1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that (2) contains a form of prospectus 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.

The undersigned registrant hereby undertakes to supplement the prospectus, after the expiration of the subscription (e) period, to set forth the results of the subscription offer, the transactions by the underwriters during the subscription period, the amount of unsubscribed securities to be purchased by the underwriters, and the terms of any subsequent reoffering thereof. If any public offering by the underwriters is to be made on terms differing from those set forth on the cover page of the prospectus, a post-effective amendment will be filed to set forth the terms of such offering.

II-6

TABLE OF CONTENTS

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-1 and has duly caused this amendment to the registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Belgrade, State of Montana, on August 26, 2016.

XTANT MEDICAL HOLDINGS, INC.

/s/ John Gandolfo

By:

Name: John Gandolfo

Title: Chief Financial Officer

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

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that the undersigned officers and directors of Xtant Medical Holdings, Inc., a Delaware corporation (the Corporation hereby constitute and appoint each of Daniel Goldberger and John Gandolfo the true and lawful agents and attorneys-in-fact of the undersigned with full power and authority in said agents and attorneys-in-fact, and in any one or more of them, to sign for the undersigned and in their respective names as an officer/director of the Corporation, 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 each of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

Signature	Capacity	Date
<i>/s/ Daniel Goldberger</i>	Chief Executive Officer and Director (Principal Executive Officer)	August 26, 2016
Daniel Goldberger <i>/s/ John P. Gandolfo</i>	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	August 26, 2016
John P. Gandolfo <i>/s/ Kent Swanson</i>	Chairman of the Board of Directors	August 26, 2016
Kent Swanson <i>/s/ Michael Lopach</i>	Director	August 26, 2016
Michael Lopach <i>/s/ John Deedrick</i>	Director	August 26, 2016
John Deedrick		

/s/ David Kirschman

Director

August 26, 2016

David Kirschman

/s/ Paul R. Buckman

Director

August 26, 2016

Paul R. Buckman

/s/ Rudy A. Mazzocchi

Director

August 26, 2016

Rudy A. Mazzocchi

/s/ Eric B. Timko

Director

August 26, 2016

Eric B. Timko

TABLE OF CONTENTS

Exhibit Index

Exhibit No.	Description
1.1	Form of Dealer-Manager Agreement
2.1	Agreement and Plan of Merger, dated as of June 30, 2010, by and among K-Kitz, Inc., KB Merger Sub, Inc. and Bacterin International, Inc. ⁽¹⁾
2.2	Common Stock Purchase Agreement dated March 16, 2015 by and between Bacterin and Aspire Capital Fund, LLC ⁽⁹⁾
2.3	Amended and Restated Common Stock Purchase Agreement dated April 17, 2015 by and between Bacterin and Aspire Capital Fund, LLC ⁽¹⁸⁾
2.4	Stock Purchase Agreement dated July 27, 2015 by and among Bacterin, X-spine Systems, Inc. and the sellers named therein ⁽¹⁹⁾
3.1	Restated Certificate of Incorporation ⁽²⁾
3.2	Certificate of Amendment to Restated Certificate of Incorporation ⁽³⁾
3.3	Certificate of Amendment to Restated Certificate of Incorporation ⁽⁴⁾
3.4	Amended and Restated Bylaws ⁽⁵⁾
4.1	Form of Warrant to Purchase Common Stock ⁽¹⁾⁽⁶⁾⁽⁷⁾
4.2	Form of Common Stock Certificate ⁽²⁶⁾
4.3	Registration Rights Agreement dated March 16, 2015 by and between Bacterin and Aspire Capital Fund, LLC ⁽⁹⁾
4.4	Registration Rights Agreement dated July 31, 2015 by and among Bacterin, Leerink Partners LLC, OrbiMed Royalty Opportunities II, LP and ROS Acquisition Offshore LP ⁽¹⁰⁾
4.5	Indenture dated July 31, 2015 by and between Bacterin and Wilmington Trust, National Association ⁽¹¹⁾
4.6	Form of 6.00% Convertible Senior Note due 2021 ⁽¹¹⁾
4.7*	Form of Subscription Rights Statement
4.7	Form of Warrant Certificate for Warrants underlying Units
4.8	Form of Warrant Agreement
4.9	Form of Pre-Funded Warrant
5.1	Opinion of Ballard Spahr LLP
10.1	Form of Indemnification Agreement for officers and directors ⁽²⁷⁾
10.2	Amended and Restated Xtant Medical Equity Incentive Plan ⁽¹²⁾
10.3	Form of Stock Option Agreement ⁽¹³⁾
10.4	Form of Amended and Restated Restricted Stock Agreement ⁽³⁴⁾
10.5	Daniel Goldberger Employment Agreement ⁽¹⁴⁾
10.6	Daniel Goldberger Stock Option Agreement ⁽¹⁵⁾
10.7	Daniel Goldberger Indemnification Agreement ⁽¹⁶⁾
10.8	John Gandolfo Employment Agreement ⁽¹⁷⁾
10.9	David Kirschman Restricted Stock Agreement ⁽³⁵⁾
10.10	Form of Director Agreement ⁽³⁹⁾
10.11	Amended and Restated Credit Agreement dated July 27, 2015 by and between Bacterin and ROS Acquisition Offshore LP ⁽²⁰⁾
10.12	Termination of Royalty Agreement dated July 27, 2015 by and between Bacterin and ROS Acquisition Offshore LP ⁽²¹⁾
10.13	

Securities Purchase Agreement dated July 27, 2015 by and between Bacterin and the investors named therein⁽²²⁾

TABLE OF CONTENTS

Exhibit No.	Description
10.14	Purchase Agreement dated July 27, 2015 by and between Bacterin and Leerink Partners LLC ⁽²³⁾
10.15	Distribution Agreement dated January 23, 2014 by and between X-spine Systems, Inc. and Zimmer Spine, Inc., as amended ⁽²⁴⁾
10.16	First Amendment to Amended and Restated Credit Agreement, dated March 31, 2016, by and among Bacterin International, as the Borrower, and Orbimed Royalty Opportunities II, LP and ROS Acquisition Offshore LP, as the Lenders ⁽²⁸⁾
10.17	Securities Purchase Agreement, dated April 14, 2016, among Xtant Medical Holdings, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP ⁽²⁹⁾
10.18	Convertible Promissory Note, dated April 14, 2016, made by Xtant Medical Holdings, Inc. in favor of ROS Acquisition Offshore LP ⁽³⁰⁾
10.19	Convertible Promissory Note, dated April 14, 2016, made by Xtant Medical Holdings, Inc. in favor of OrbiMed Royalty Opportunities II, LP ⁽³¹⁾
10.20	Registration Rights Agreement, dated April 14, 2016, among Xtant Medical Holdings, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP ⁽³²⁾
10.21	Amendment to Amended and Restated Credit Agreement, dated as of April 14, 2016, by and among Bacterin International, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP ⁽³³⁾
10.22	Fourth Amendment to Amended and Restated Credit Agreement, dated as of July 29, 2016, by and among Bacterin International, Inc., ROS Acquisition Offshore LP and OrbiMed Royalty Opportunities II, LP ⁽³⁸⁾
10.23	Loan and Security Agreement, dated May 25, 2016, among Xtant Medical Holdings, Inc., Bacterin International, Inc., X-spine Systems, Inc., Xtant Medical, Inc. and Silicon Valley Bank ⁽³⁶⁾
10.24	Intellectual Property Security Agreement, dated May 25, 2016, among Xtant Medical Holdings, Inc., Bacterin International, Inc., X-spine Systems, Inc., Xtant Medical, Inc. and Silicon Valley Bank ⁽³⁷⁾
10.25	First Loan Modification Agreement, dated August 12, 2016, among Xtant Medical Holdings, Inc., Bacterin International, Inc., X-spine Systems, Inc., Xtant Medical, Inc. and Silicon Valley Bank ⁽⁴⁰⁾
21.1	Subsidiaries of the Registrant ⁽²⁵⁾
23.1*	Consent of Independent Accounting Firm, EKS&H LLLP
23.2	Consent of Ballard Spahr LLP (included in Exhibit 5.1)
24.1	Power of Attorney (included on signature page)
99.1*	Form of Instructions as to Use of Subscription Rights Statements
99.2*	Form of Letter to Stockholders who are Record Holders
99.3*	Form of Letter to Brokers, Dealers, Banks and Other Nominees
99.4*	Form of Broker Letter to Clients Who are Beneficial Holders
99.5*	Form of Beneficial Owner Election Form
99.6*	Form of Nominee Holder Certification
99.7*	Form of Notice of Important Tax Information

Indicates a management contract or compensatory plan.

* Filed herewith.

** Furnished herewith.

TABLE OF CONTENTS

- (1) Incorporated herein by reference to the Registrant's Form 8-K filed with the SEC on June 30, 2010.
 - (2) Incorporated by reference to Exhibit 3.1 to the Registrant's Form 10-Q filed with the SEC on November 14, 2011.
 - (3) Incorporated by reference to Exhibit 3.1 to the Registrant's Form 8-K filed with the SEC on July 25, 2014.
 - (4) Incorporated by reference to Exhibit 3.1 to the Registrant's Form 8-K filed with the SEC on August 3, 2015.
 - (5) Incorporated by reference to Exhibit 3.2 to the Registrant's Form 8-K filed with the SEC on October 1, 2015.
 - (6) Incorporated by reference to Exhibit 4.1 to the Registrant's Form 8-K filed with the SEC on July 31, 2014.
 - (7) Incorporated by reference to Exhibit 4.1 to the Registrant's Form 8-K filed with the SEC on June 5, 2013.
 - (8) Incorporated by reference to the Registrant's Form 10-K filed with the SEC on March 18, 2015.
 - (9) Incorporated by reference to the Registrant's Form 8-K filed with the SEC on March 17, 2015.
 - (10) Incorporated by reference to Exhibit 10.3 to the Registrant's Form 8-K filed with the SEC on August 3, 2015.
 - (11) Incorporated by reference to Exhibit 10.2 to the Registrant's Form 8-K filed with the SEC on August 3, 2015.
 - (12) Incorporated by reference to Exhibit 10.8 to the Registrant's Form 10-Q filed with the SEC on November 16, 2015.
 - (13) Incorporated by reference to Exhibit 10.23 to the Registrant's Form 10-Q filed with the SEC on May 4, 2012.
 - (14) Incorporated by reference to Exhibit 10.25 to the Registrant's Form 8-K filed with the SEC on August 15, 2013.
 - (15) Incorporated by reference to Exhibit 10.1 to the Registrant's Registration Statement on Form S-8 filed with the SEC on September 19, 2013.
 - (16) Incorporated by reference to Exhibit 10.26 to the Registrant's Form 10-Q filed with the SEC on November 14, 2013.
 - (17) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on July 29, 2014.
 - (18) Incorporated by reference to Exhibit 10.23 to the Registrant's Registration Statement on Form S-1 filed with the SEC on April 17, 2015.
 - (19) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on July 28, 2015.
 - (20) Incorporated by reference to Exhibit 10.2 to the Registrant's Form 8-K filed with the SEC on July 28, 2015.
 - (21) Incorporated by reference to Exhibit 10.3 to the Registrant's Form 8-K filed with the SEC on July 28, 2015.
 - (22) Incorporated by reference to Exhibit 10.4 to the Registrant's Form 8-K filed with the SEC on July 28, 2015.
 - (23) Incorporated by reference to Exhibit 10.5 to the Registrant's Form 8-K filed with the SEC on July 28, 2015.
 - (24) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on August 3, 2015.
 - (25) Incorporated by reference to Exhibit 21.1 to the Registrant's Registration Statement on Form S-1/A filed with the SEC on August 25, 2015.
 - (26) Incorporated by reference to Exhibit 4.2 to the Registrant's Registration Statement on Form S-1 filed with the SEC on December 21, 2015.
 - (27) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 10-K filed with the SEC on March 18, 2015.
-

TABLE OF CONTENTS

- (28) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on April 1, 2016.
 - (29) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on April 19, 2016.
 - (30) Incorporated by reference to Exhibit 10.2 to the Registrant's Form 8-K filed with the SEC on April 19, 2016.
 - (31) Incorporated by reference to Exhibit 10.3 to the Registrant's Form 8-K filed with the SEC on April 19, 2016.
 - (32) Incorporated by reference to Exhibit 10.4 to the Registrant's Form 8-K filed with the SEC on April 19, 2016.
 - (33) Incorporated by reference to Exhibit 10.5 to the Registrant's Form 8-K filed with the SEC on April 19, 2016.
 - (34) Incorporated by reference to Exhibit 10.4 to the Registrant's Form 10-K filed with the SEC on March 24, 2016.
 - (35) Incorporated by reference to Exhibit 10.10 to the Registrant's Form 10-K filed with the SEC on March 24, 2016.
 - (36) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on May 31, 2016.
 - (37) Incorporated by reference to Exhibit 10.2 to the Registrant's Form 8-K filed with the SEC on May 31, 2016.
 - (38) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on August 2, 2016.
 - (39) Incorporated by reference to Exhibit 10.3 to the Registrant's Form 10-Q filed with the SEC on August 10, 2016.
 - (40) Incorporated by reference to Exhibit 10.1 to the Registrant's Form 8-K filed with the SEC on August 16, 2016.
-