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

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POST-EFFECTIVE AMENDMENT NO. 1 TO  
FORM S-8 REGISTRATION STATEMENT NO. 333-268052

POST-EFFECTIVE AMENDMENT NO. 1 TO  
FORM S-8 REGISTRATION STATEMENT NO. 333-249762

POST-EFFECTIVE AMENDMENT NO. 1 TO  
FORM S-8 REGISTRATION STATEMENT NO. 333-234595

POST-EFFECTIVE AMENDMENT NO. 1 TO  
FORM S-8 REGISTRATION STATEMENT NO. 333-226588

*UNDER THE SECURITIES ACT OF 1933*

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**XTANT MEDICAL HOLDINGS, INC.**  
(Exact name of registrant as specified in its charter)

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

**20-5313323**  
(I.R.S. Employer  
Identification No.)

**664 Cruiser Lane**  
**Belgrade, Montana**  
(Address of Principal Executive Offices)

**59714**  
(Zip Code)

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**Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan**  
**Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan**  
(Full title of the plan)

**Sean E. Browne**  
**President and Chief Executive Officer**  
**Xtant Medical Holdings, Inc.**  
**664 Cruiser Lane**  
**Belgrade, Montana 59714**  
(Name and address of agent for service)

**(406) 388-0480**  
(Telephone number, including area code, of agent for service)

**Copies requested to:**  
**Amy E. Culbert, Esq.**  
**Emily Humbert, Esq.**  
**Fox Rothschild LLP**  
**City Center**  
**33 South Sixth Street, Suite 3600**  
**Minneapolis, Minnesota 55402-3601**  
**(612) 607-7000**

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

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

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

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## EXPLANATORY NOTE

This Post-Effective Amendment No. 1 (this Post-Effective Amendment No. 1) relates to each of the following Registration Statements on Form S-8 (collectively, 2018 Plan Registration Statements) of Xtant Medical Holdings, Inc. (Company or Registrant) filed with the Securities and Exchange Commission (SEC) to register under the Securities Act of 1933, as amended (Securities Act), that number of shares of common stock, all with par value \$0.000001 per share, of the Company (Common Stock) as indicated below, pursuant to the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan, as amended and restated (2018 Plan):

- Registration Statement on Form S-8 (Registration No. 333-268052) filed by the Company with the SEC on October 28, 2022 registering 8,500,000 shares of Common Stock;
- Registration Statement on Form S-8 (Registration No. 333-249762) filed by the Company with the SEC on October 30, 2020 registering 5,550,308 shares of Common Stock;
- Registration Statement on Form S-8 (Registration No. 333-234595) filed by the Company with the SEC on November 8, 2019 registering 1,500,000 shares of Common Stock; and
- Registration Statement on Form S-8 (Registration No. 333-226588) filed by the Company with the SEC on August 3, 2018 registering 1,307,747 shares of Common Stock.

On July 26, 2023 (Effective Date), the stockholders of the Company approved and adopted the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan (2023 Plan). As of the Effective Date, the Company's authority to grant new awards under the 2018 Plan terminated upon stockholder approval of the 2023 Plan on such date. The maximum number of shares of Common Stock available for issuance under the 2023 Plan, subject to adjustment pursuant to the terms of the 2023 Plan, is (i) 5,500,000 shares of Common Stock (New 2023 Plan Shares); (ii) 7,695,812 shares of Common Stock remaining available for issuance under the 2018 Plan but not subject to outstanding awards under the 2018 Plan as of the Effective Date (2018 Plan Carryover Shares); and (iii) up to 6,686,090 shares of Common Stock subject to awards outstanding under the 2018 Plan as of the Effective Date but only to the extent such awards are subsequently forfeited, cancelled, expire, or otherwise terminate without the issuance of such shares of Common Stock after the Effective Date (2018 Plan Unused Award Shares).

The Company is filing this Post-Effective Amendment No. 1 to each of the 2018 Plan Registration Statements, pursuant to the undertaking in Item 512(a)(1)(iii) of SEC Regulation S-K, which requires the Company to disclose a material change in the plan of distribution as it was originally disclosed in the 2018 Plan Registration Statements, to reflect that the Company's authority to grant new awards under the 2018 Plan terminated and to add the 2023 Plan and reflect that, as of the Effective Date, the previously registered 2018 Plan Carryover Shares and any 2018 Plan Unused Award Shares may be issued under the 2023 Plan, a copy of which is incorporated herein by reference as an exhibit hereto along with a new opinion as the validity of the 2018 Plan Carryover Shares and any 2018 Plan Unused Award Shares issuable pursuant to the 2023 Plan.

This Post-Effective Amendment No. 1 amends and supplements the items listed below. All other items of the Registration Statements are incorporated herein by reference without change (the 2018 Plan Registration Statements as amended by this Post-Effective Amendment No. 1, collectively the Amended 2018 Plan Registration Statements).

No additional shares of Common Stock are being registered hereby.

Contemporaneously with the filing of this Post-Effective Amendment No. 1, the Company is filing a new Registration Statement on Form S-8 to register the New 2023 Plan Shares available for offer or sale pursuant to the 2023 Plan and such indeterminate number of shares as may become available under the 2023 Plan as a result of the adjustment provisions thereof pursuant to Rule 416(a) under the Securities Act.

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**PART I**  
**INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS**

Information required by Part I of Form S-8 to be contained in the Section 10(a) prospectus is omitted from the Amended 2018 Plan Registration Statements in accordance with the provisions of Rule 428 under the Securities Act. The documents containing the information specified in Part I will be delivered to the participants in the 2023 Plan covered by these Amended 2018 Plan Registration Statements as required by Rule 428(b)(1). Such documents are not required to be filed with the SEC as part of these Amended 2018 Plan Registration Statements.

**PART II**  
**INFORMATION REQUIRED IN THE REGISTRATION STATEMENT**

**Item 3. Incorporation of Documents by Reference.**

The Company hereby incorporates by reference into these Amended 2018 Plan Registration Statements the following documents which have been previously filed (not furnished) with the SEC (SEC File No. 001-34951):

- the Company's [Annual Report on Form 10-K for the year ended December 31, 2022](#), filed on March 7, 2023;
- the Company's [Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2023](#), filed on May 4, 2023;
- the Company's 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 9, 2023](#), [February 1, 2023](#), [March 1, 2023](#) (as amended on [May 16, 2023](#)), [May 4, 2023](#), [May 18, 2023](#), [May 19, 2023](#), [June 20, 2023](#), [July 3, 2023](#), [July 11, 2023](#), [July 28, 2023](#) and [July 28 2023](#);
- the Company's [Definitive Proxy Statement on Schedule 14A, filed on June 8, 2023 for the Company's 2023 Annual Meeting of Stockholders held on July 26, 2023](#); and
- the description of the Company's common stock contained in its registration statement on Form 8-A, filed on [October 15, 2015](#), as amended [March 8, 2022](#), including any amendment or reports filed for the purpose of updating such description.

In addition, all other documents filed (not furnished) by the Company pursuant to Section 13(a), Section 13(c), Section 14 or Section 15(d) of the Securities Exchange Act of 1934, as amended (Exchange Act) on or after the date of this Post-Effective Amendment No. 1 and prior to the filing of a post-effective amendment to these Amended 2018 Plan Registration Statements that indicates that all securities offered hereby and thereby have been sold or that deregisters all securities then remaining unsold shall be deemed to be incorporated in these Amended 2018 Plan Registration Statements by reference and to be a part of these Amended 2018 Plan Registration Statements from the date of filing of such documents; *provided, however*, that documents or information deemed to have been furnished to and not filed with the SEC in accordance with the rules of the SEC shall not be deemed incorporated by reference into these Amended 2018 Plan Registration Statements.

Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of these Amended 2018 Plan Registration Statements to the extent that a statement contained herein or in any subsequently filed document which also is deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of these Amended 2018 Plan Registration Statements.

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## **Item 6. Indemnification of Directors and Officers.**

### ***Delaware General Corporation Law***

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

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

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

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

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

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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.

Section 102(b)(7) of the DGCL permits a corporation to provide in its certificate of incorporation that a director or officer of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director or an officer, except for liability for any breach of the director's or officer's duty of loyalty to the corporation or its stockholders, for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, for unlawful payments of dividends or unlawful stock purchases or redemptions in the case of a director, for any transaction from which the director or officer derived an improper personal benefit or in the case of an officer any action by or in the right of the corporation. No such provision shall eliminate or limit the liability of a director or officer for any act or omission occurring prior to the date when such provision becomes effective.

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

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

### ***Bylaws***

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

### ***Indemnification Agreements***

The Company has entered into agreements with its directors and executive officers that require the Company 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***

The Company 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.

### ***Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan***

Section 22.10 of the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan, as amended and restated, provides that subject to any limitations and requirements of Delaware law, each individual who is or will have been a member of the Board, or a committee appointed by the Board, or an officer or employee of the Company to whom authority was delegated in accordance with Section 3.3 of the 2018 Plan, will be indemnified and held harmless by the Company against and from any loss, cost, liability or expense that may be imposed upon or reasonably incurred by him or her in connection with or resulting from any claim, action, suit or proceeding to which he or she may be a party or in which he or she may be involved by reason of any action taken or failure to act under the 2018 Plan and against and from any and all amounts paid by him or her in settlement thereof, with the Company's approval, or paid by him or her in satisfaction of any judgment in any such action, suit or proceeding against him or her, provided he or she will give the Company an opportunity, at its own expense, to handle and defend the same before he or she undertakes to handle and defend it on his/her own behalf.

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### ***Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan***

Section 22.11 of the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan provides that subject to any limitations and requirements of Delaware law, each individual who is or will have been a member of the Board, or a committee appointed by the Board, or an officer or employee of the Company to whom authority was delegated in accordance with Section 3.3 of the 2023 Plan, will be indemnified and held harmless by the Company against and from any loss, cost, liability or expense that may be imposed upon or reasonably incurred by him or her in connection with or resulting from any claim, action, suit or proceeding to which he or she may be a party or in which he or she may be involved by reason of any action taken or failure to act under the 2023 Plan and against and from any and all amounts paid by him or her in settlement thereof, with the Company's approval, or paid by him or her in satisfaction of any judgment in any such action, suit or proceeding against him or her, provided he or she will give the Company an opportunity, at its own expense, to handle and defend the same before he or she undertakes to handle and defend it on his/her own behalf.

The foregoing description of Section 145 of the DGCL, our Amended and Restated Certificate of Incorporation, Second Amended and Restated Bylaws, the 2018 Plan and the 2023 Plan is only a summary and is qualified in its entirety by the full text of each of the foregoing.

The Company understands that it is the position of the SEC that insofar as the foregoing provisions may be invoked to disclaim liability for damages arising under the Securities Act, that such provisions are against public policy as expressed in the Securities Act and are therefore unenforceable.

### **Item 8. Exhibits.**

The following exhibits are filed with or incorporated by reference into these Amended 2018 Plan Registration Statements:

| <b>Exhibit No.</b> | <b>Description</b>   |
|--------------------|--|
| 4.1                | <a href="#"><u>Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on February 13, 2018 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>   |
| 4.2                | <a href="#"><u>Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc. (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 31, 2019 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>            |
| 4.3                | <a href="#"><u>Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc., as Amended (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 1, 2020 (SEC File No. 001-34951) and incorporated by reference herein)</u></a> |
| 4.4                | <a href="#"><u>Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc., as Amended (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on July 28, 2023 (SEC File No. 001-34951) and incorporated by reference herein)</u></a>   |

| Exhibit No. | Description   |
|-------------|---|
| 4.5         | <a href="#">Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc., as Amended (filed as Exhibit 3.2 to the Registrant's Current Report on Form 8-K filed with the SEC on July 28, 2023 (SEC File No. 001-34951) and incorporated by reference herein)</a> |
| 4.6         | <a href="#">Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Xtant Medical Holdings, Inc., as Amended (filed as Exhibit 3.3 to the Registrant's Current Report on Form 8-K filed with the SEC on July 28, 2023 (SEC File No. 001-34951) and incorporated by reference herein)</a> |
| 4.7         | <a href="#">Third Amended and Restated Bylaws of Xtant Medical Holdings, Inc. (Effective as of June 1, 2023) (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed with the SEC on May 19, 2023 (SEC File No. 001-34951) and incorporated by reference herein)</a>                               |
| 4.8         | <a href="#">Form of Common Stock Certificate of Xtant Medical Holdings, Inc. (filed as Exhibit 4.2 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2021 filed with the SEC on March 8, 2022 (SEC File No. 001-34951) and incorporated by reference herein)</a>                         |
| 5.1*        | <a href="#">Opinion of Fox Rothschild LLP regarding the validity of the shares of common stock being registered</a>   |
| 23.1*       | <a href="#">Consent of Plante &amp; Moran, PLLC</a>   |
| 23.2*       | <a href="#">Consent of Plante &amp; Moran, PLLC with respect to the abbreviated financial statements of Surgalign SPV, Inc., which report appears in a Current Report on Form 8-K/A of Xtant Medical Holdings, Inc. filed May 16, 2023</a>  |
| 23.3*       | <a href="#">Consent of Fox Rothschild LLP (included within the opinion filed as Exhibit 5.1)</a>  |
| 24.1*       | <a href="#">Power of Attorney (included on signature page to this Post-Effective Amendment No. 1)</a>   |
| 99.1        | <a href="#">Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on July 28, 2023 (SEC File No. 001-34951) and incorporated by reference herein)</a>  |

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\* Filed herewith.

#### Item 9. Undertakings.

(a) The Registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to these Amended 2018 Plan Registration Statements:

(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 these Amended 2018 Plan Registration Statements (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in these Amended 2018 Plan Registration Statements. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

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(iii) To include any material information with respect to the plan of distribution not previously disclosed in these Amended 2018 Plan Registration Statements or any material change to such information in these Amended 2018 Plan Registration Statements;

*Provided, however,* that paragraphs (a)(1)(i) and (a)(1)(ii) herein do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the SEC by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in these Amended 2018 Plan Registration Statements;

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

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

(b) The Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in these Amended 2018 Plan Registration Statements shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to the 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 SEC 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 final adjudication of such issue.

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## 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-8 and has duly caused this Post-Effective Amendment No. 1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Belgrade, State of Montana, on July 28, 2023.

### XTANT MEDICAL HOLDINGS, INC.

By: /s/ Sean E. Browne

Sean E. Browne

President and Chief Executive Officer

## POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Stavros Vizirgianakis, Sean E. Browne and Scott C. Neils, and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution for him or her in any and all capacities, to sign (i) any and all amendments (including post-effective amendments) to these Amended 2018 Plan Registration Statements and (ii) any registration statement or post-effective amendment thereto to be filed with the Securities and Exchange Commission pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Post-Effective Amendment No. 1 has been signed by the following persons in the capacities and on the dates indicated.

| <b>Name and Signature</b>                                 | <b>Title</b>  | <b>Date</b>   |
|---|---|---------------|
| <u>/s/ Sean E. Browne</u><br>Sean E. Browne               | President and Chief Executive Officer and Director<br>(principal executive officer) | July 28, 2023 |
| <u>/s/ Scott C. Neils</u><br>Scott C. Neils               | Chief Financial Officer<br>(principal financial and accounting officer)             | July 28, 2023 |
| <u>/s/ Stavros Vizirgianakis</u><br>Stavros Vizirgianakis | Chairman of the Board   | July 28, 2023 |
| <u>/s/ John K. Bakewell</u><br>John K. Bakewell           | Director  | July 28, 2023 |
| <u>/s/ Jonn R. Beeson</u><br>Jonn R. Beeson               | Director  | July 28, 2023 |
| <u>/s/ Lori Mitchell-Keller</u><br>Lori Mitchell-Keller   | Director  | July 28, 2023 |
| <u>/s/ Robert E. McNamara</u><br>Robert E. McNamara       | Director  | July 28, 2023 |

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[Fox Rothschild LLP Letterhead]

July 28, 2023

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

**Re: Xtant Medical Holdings, Inc.  
Post-Effective Amendment No. 1 Registration Statements on Form S-8**

Ladies and Gentlemen:

We have acted as counsel to Xtant Medical Holdings, Inc., a Delaware corporation (the “Company”), in connection with the preparation of the Post-Effective Amendment No. 1 (the “Post-Effective Amendment”) to each of the following Registration Statements on Form S-8 (collectively, the “2018 Plan Registration Statements”) which 2018 Plan Registration Statements registered under the Securities Act of 1933, as amended (the “Securities Act”), that number of shares of common stock, all with par value \$0.000001 per share, of the Company (the “Common Stock”) as indicated below, pursuant to the Xtant Medical Holdings, Inc. 2018 Equity Incentive Plan, as amended and restated (the “2018 Plan”); such Post-Effective Amendment to be filed by the Company with the Securities and Exchange Commission (the “SEC”) on July 28, 2023:

- Registration Statement on Form S-8 (Registration No. 333-268052) filed by the Company with the SEC on October 28, 2022 registering 8,500,000 shares of Common Stock;
- Registration Statement on Form S-8 (Registration No. 333-249762) filed by the Company with the SEC on October 30, 2020 registering 5,550,308 shares of Common Stock;
- Registration Statement on Form S-8 (Registration No. 333-234595) filed by the Company with the SEC on November 8, 2019 registering 1,500,000 shares of Common Stock; and
- Registration Statement on Form S-8 (Registration No. 333-226588) filed by the Company with the SEC on August 3, 2018 registering 1,307,747 shares of Common Stock.

The Post-Effective Amendment reflects that as of July 26, 2023 (the “Effective Date”), the date of stockholder approval of the Xtant Medical Holdings, Inc. 2023 Equity Incentive Plan (the “2023 Plan”), the Company’s authority to grant new awards under the 2018 Plan terminated and all shares of Common Stock remaining available for issuance under the 2018 Plan but not subject to outstanding awards under the 2018 Plan as of the Effective Date became available for issuance under the 2023 Plan (the “2018 Plan Carryover Shares”), as well as shares of Common Stock subject to awards outstanding under the 2018 Plan as of the Effective Date but only to the extent such awards are subsequently forfeited, cancelled, expire, or otherwise terminate without the issuance of such shares of Common Stock after the Effective Date (the “2018 Plan Unused Award Shares” and together with the 2018 Plan Carryover Shares, the “Shares”).

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In connection with this opinion, we have examined and relied upon the originals, or copies certified or otherwise identified to our satisfaction, of such records, documents, certificates and other instruments as in our judgment are necessary or appropriate to enable us to render the opinions expressed below. As to certain factual matters, we have relied upon certificates of the officers of the Company and have not sought to independently verify such matters.

In rendering this opinion, we have assumed the genuineness and authenticity of all signatures on original documents; the legal capacity of all natural persons; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as certified or photocopies; the authenticity of the originals of such latter documents, including electronic signatures made and/or transmitted using electronic signature technology (e.g., via DocuSign or similar electronic signature technology); that any such signed electronic record shall be valid and as effective to bind the party so signing as a paper copy bearing such party's handwritten signature; the accuracy and completeness of all documents and records reviewed by us; the accuracy, completeness and authenticity of certificates issued by any governmental official, office or agency and the absence of change in the information contained therein from the effective date of any such certificate; and other than for the Company, the due authorization, execution and delivery of all documents where authorization, execution and delivery are prerequisites to the effectiveness of such documents.

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

On the basis of the foregoing and in reliance thereon, and subject to the qualifications herein stated, we are of the opinion that the Shares registered pursuant to the 2018 Plan Registration Statements, as amended by the Post-Effective Amendment, have been duly and validly authorized and reserved for issuance and that upon the issuance of the Shares and payment therefor in accordance with the provisions of the 2023 Plan, the Shares will be validly issued, fully paid and non-assessable.

We hereby consent to the filing of this opinion as an exhibit to the Post-Effective Amendment. In giving such consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the SEC thereunder. This opinion is expressed as of the date hereof, and we disclaim any undertaking to update or supplement this opinion or to advise you of any subsequent changes in the facts stated or assumed herein or of any subsequent changes in applicable law.

Very truly yours,

/s/ Fox Rothschild LLP

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**Consent of Independent Registered Public Accounting Firm**

The Board of Directors  
Xtant Medical Holdings, Inc.:

We consent to the incorporation by reference in this Post-Effective Amendment to the Registration Statements on Form S-8 of our report dated March 7, 2023, with respect to the consolidated financial statements of Xtant Medical Holdings, Inc. included in its Annual Report on Form 10-K as of and for the years ended December 31, 2022 and 2021, as filed with the Securities and Exchange Commission.

/s/ Plante & Moran, PLLC

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Denver, Colorado  
July 28, 2023

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**Consent of Independent Registered Public Accounting Firm**

The Board of Directors  
Xtant Medical Holdings, Inc.:

We consent to the incorporation by reference in this Post-Effective Amendment to the Registration Statements on Form S-8 of our report dated May 16, 2023 with respect to the abbreviated financial statements of Surgalign SPV, Inc., which report appears in the Form 8-K/A of Xtant Medical Holdings, Inc. filed with the Securities and Exchange Commission on May 16, 2023.

/s/ Plante & Moran, PLLC

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Denver, Colorado  
July 28, 2023

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