



June 11, 2024

MAKO Surgical Corp.  
Anne Edwards  
Principal Regulatory Affairs Specialist  
3365 Enterprise Avenue  
Weston, Florida 33331

Re: K241011  
Trade/Device Name: Mako Total Knee Application  
Regulation Number: 21 CFR 882.4560  
Regulation Name: Stereotaxic Instrument  
Regulatory Class: Class II  
Product Code: OLO  
Dated: April 11, 2024  
Received: April 12, 2024

Dear Anne Edwards:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm> identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device" (<https://www.fda.gov/media/99812/download>) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (<https://www.fda.gov/media/99785/download>).

Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see <https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products>); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems>.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance>) and CDRH Learn (<https://www.fda.gov/training-and-continuing-education/cdrh-learn>). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice>) for more information or contact DICE by email ([DICE@fda.hhs.gov](mailto:DICE@fda.hhs.gov)) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Jesse Muir - Digitally signed by  
Jesse Muir -S  
Date: 2024.06.11  
12:17:58 -04'00'

For: Shumaya Ali, M.P.H.

Assistant Director

DHT6C: Division of Restorative, Repair  
and Trauma Devices

OHT6: Office of Orthopedic Devices

Office of Product Evaluation and Quality

Center for Devices and Radiological Health

Enclosure

## Indications for Use

510(k) Number (if known)  
K241011

Device Name  
Mako Total Knee Application

### Indications for Use (Describe)

The Mako System is intended to assist the surgeon in providing software defined spatial boundaries for orientation and reference information to anatomical structures during orthopedic procedures.

The Mako System is indicated for use in surgical knee procedures in which the use of stereotactic surgery may be appropriate, and where reference to rigid anatomical bony structures can be identified relative to a CT based model of the anatomy. These procedures include:

- Total Knee Arthroplasty (TKA)

The implant systems compatible with the system:

- Triathlon Total Knee System (CR/CS/PS/PSR cemented and cementless primary)
- Triathlon Total Knee System (TS inserts cemented primary)

Type of Use (Select one or both, as applicable)

Prescription Use (Part 21 CFR 801 Subpart D)

Over-The-Counter Use (21 CFR 801 Subpart C)

### CONTINUE ON A SEPARATE PAGE IF NEEDED.

This section applies only to requirements of the Paperwork Reduction Act of 1995.

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## 510(k) SUMMARY

**Sponsor:** Mako Surgical Corp.  
3365 Enterprise Ave  
Weston, FL 33331

**Contact Person:** Anne Edwards  
Principal Regulatory Affairs Specialist  
[Anne.Edwards@stryker.com](mailto:Anne.Edwards@stryker.com)  
505-221-0267

**Date Prepared:** June 7, 2024

**Proprietary Name:** Mako Total Knee Application

**Common Name:** Total Knee Application (TKA)

**Regulation Name:** Stereotaxic Instrument

**Regulation Number:** 21 CFR Section 882.4560

**Device Classification:** Class II

**Product Code:** OLO

### Substantial Equivalence Claimed To:

The subject device, the Mako Total Knee Application, is substantially equivalent to the predicate device, the Mako Total Knee Application, cleared in K220459.

In addition, the Stryker Q Guidance System used as part of the Mako System hardware is substantially equivalent to the reference device, the Q Guidance System cleared in K233542.

### Device Modification:

**Hardware changes:** A new robotic arm part number has been created for compatibility with Stryker Q Guidance System, which replaces the Mako Camera Stand and Guidance Module.

**Labeling:** Labeling provided with the device has been updated to reflect the modifications made.

**Software Changes:** The Mako Total Knee Application has undergone minor modifications for compatibility with the Stryker Q Guidance System. The form, fit, and function of the clinical application have not changed.

### Mako Surgical Corp.

3365 Enterprise Ave, Weston, FL 33331 USA | P 954.927.2044 | F 954.927.0446 | [stryker.com](http://stryker.com)



### Description:

The Mako System with the subject Mako Total Knee Application is a stereotactic instrument that includes a robotic arm, an integrated cutting system, an optical detector, camera, a computer, dedicated instrumentation, operating software, and tools and accessories.

The system's architecture is designed to support total and partial knee procedures and total hip procedures. With application specific hardware and software, the system provides haptic guidance during orthopedic surgical procedures by using patient CT data to assist a surgeon with pre-surgical planning, implant placement and interpretive/intraoperative navigation of the patient's anatomy.

Once configured for a specific application, the Mako robotic-arm can serve as the surgeon's "intelligent" tool holder or tool guide by passively constraining the preparation of an anatomical site for an orthopedic implant with software-defined spatial boundaries.

### Summary of Technological Characteristics Compared to Predicate Device:

The technological characteristics of the Mako Total Knee Application compared to the predicate device are listed below:

Technological Characteristics	Mako Total Knee Application	Mako Total Knee Application - K220459
Major Components	Robotic arm, Stryker Q Guidance System, cutting system.	Robotic Arm, Guidance Module, Camera Stand, cutting system, preoperative planning laptop.
Tools/accessories	Various reusable and disposable instruments	Various reusable and disposable instruments
Image Use	CT	CT

### Intended Use

The subject device has the same intended use as that specified in the cleared 510(k) premarket notification for the predicate device listed in this 510(k) premarket notification.

### Indications for Use: Mako Total Knee Application

The Mako System is intended to assist the surgeon in providing software defined spatial boundaries for orientation and reference information to anatomical structures during orthopedic procedures.

The Mako System is indicated for use in surgical knee procedures in which the use of stereotactic surgery may be appropriate, and where reference to rigid anatomical bony structures can be identified relative to a CT based model of the anatomy. These procedures include:

### Mako Surgical Corp.

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- Total Knee Arthroplasty (TKA)

The implant systems compatible with the system:

- Triathlon Total Knee System (CR/CS/PS/PSR cemented and cementless primary)
- Triathlon Total Knee System (TS inserts cemented primary)

**Performance Data** – The modified Mako System with the subject Mako Total Knee Application has been evaluated through the following non-clinical performance testing:

- Software Functional Testing
- Cutting System Accuracy
- Cable Reliability
- Software Performance Verification
- System Testing
- Cadaveric Design Validation
- Summative Evaluation

**Conclusions:**

The hardware and software of the subject Mako System with Mako Total Knee Application is identical to the hardware and software of the predicate Mako System with Mako Total Knee Application. The software modifications being made do not impact the intended use or the fundamental technology of the device. Furthermore, performance testing demonstrates that the characteristics of the subject Mako Total Knee Application are equivalent to the characteristics of the predicate device. The subject device is also as safe and as effective as the predicate device and does not raise different questions of safety and effectiveness. Therefore, the performance testing supports a determination of substantial equivalence.