



October 26, 2017

NuVasive, Incorporated  
Cynthia Adams  
Senior Specialist, Regulatory Affairs  
7475 Lusk Boulevard  
San Diego, California 92121

Re: K172341

Trade/Device Name: NuVasive® Modulus TLIF Interbody System  
Regulation Number: 21 CFR 888.3080  
Regulation Name: Intervertebral body fusion device  
Regulatory Class: Class II  
Product Code: MAX, PHM  
Dated: August 25, 2017  
Received: August 28, 2017

Dear Ms. Adams:

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 (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. 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.

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 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Division of Industry and Consumer Education (DICE) at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education (DICE) at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely,

Ronald P. Jean -S for

Mark N. Melkerson  
Director  
Division of Orthopedic Devices  
Office of Device Evaluation  
Center for Devices and  
Radiological Health

Enclosure

## Indications for Use

510(k) Number (if known)

K172341

Device Name

NuVasive® Modulus TLIF Interbody System

Indications for Use (Describe)

The NuVasive Modulus TLIF Interbody System is indicated for intervertebral body fusion of the spine in skeletally mature patients. The System is designed for use with autogenous and/or allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft to facilitate fusion and supplemental internal spinal fixation systems cleared by the FDA for use in the thoracolumbar spine. The devices are to be used in patients who have had at least six months of non-operative treatment.

The NuVasive Modulus TLIF Interbody System is intended for use in interbody fusions in the thoracic spine from T1 to T12 and at the thoracolumbar junction (T12-L1), and is intended for use in the lumbar spine, from L1 to S1, for the treatment of symptomatic disc degeneration (DDD) or degenerative spondylolisthesis at one or two adjacent levels, including thoracic disc herniation (with myelopathy and/or radiculopathy with or without axial pain). DDD is defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies. The NuVasive Modulus TLIF Interbody System can be used as an adjunct to fusion in patients diagnosed with multilevel degenerative scoliosis.

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.

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**510(k) Summary**

In accordance with Title 21 of the Code of Federal Regulations, Part 807, and in particular 21 CFR §807.92, the following summary of information is provided:

**A. Submitted by:**

Cynthia Adams  
Senior Specialist, Regulatory Affairs  
NuVasive, Incorporated  
7475 Lusk Blvd.  
San Diego, California 92121  
Telephone: (858) 909-1800

Date Prepared: October 23, 2017

**B. Device Name**

Trade or Proprietary Name:	<i>NuVasive® Modulus TLIF Interbody System</i>
Common or Usual Name:	Intervertebral Body Fusion Device
Classification Name:	Intervertebral Body Fusion Device

Device Class:	Class II
Classification:	21 CFR § 888.3080
Product Code:	MAX, PHM

**C. Predicate Devices**

The subject *NuVasive Modulus TLIF Interbody System* is substantially equivalent to the primary predicate device *Modulus XLIF Interbody Implants* cleared in 510(k) K163230. Additional predicates include *NuVasive CoRoent Thoracolumbar System* (K170962), *CoRoent System* (K141665) and *NuVasive TLX Interbody System* (K171633).

**D. Device Description**

The subject *NuVasive Modulus TLIF Interbody System* are interbody implants manufactured from titanium alloy (Ti-6Al-4V ELI) powder conforming to ASTM F3001. The solid and porous structures are simultaneously built using a powder bed fusion method. The hollow core, or graft aperture, allows for packing of graft to aid in the promotion of a solid fusion. Similarly, the macroporous internal lattice structure provides additional space for graft packing. The microporous, textured surface on the superior and inferior ends of the device serves to grip the adjacent vertebrae to resist migration and expulsion of the device. The device is intended to be used with supplemental internal spinal fixation systems that are cleared by the FDA for use in the thoracolumbar spine.

The implants are available in a variety sizes and lordotic angles to suit the individual pathology and anatomical conditions of the patient. The device is intended to be used with supplemental spinal fixation systems that are cleared by the FDA for use in the thoracolumbar spine.

**E. Indications for Use**

The NuVasive Modulus TLIF Interbody System is indicated for intervertebral body fusion of the spine in skeletally mature patients. The System is designed for use with autogenous and/or allogeneic bone graft comprised of cancellous and/or corticocancellous bone graft to facilitate fusion and supplemental internal spinal fixation systems cleared by the FDA for use in the thoracolumbar spine. The devices are to be used in patients who have had at least six months of non-operative treatment.

The Modulus TLIF Interbody System is intended for use in interbody fusions in the thoracic spine from T1 to T12 and at the thoracolumbar junction (T12-L1), and is intended for use in the lumbar spine, from L1 to S1, for the treatment of symptomatic disc degeneration (DDD) or degenerative spondylolisthesis at one or two adjacent levels, including thoracic disc herniation (with myelopathy and/or radiculopathy with or without axial pain). DDD is defined as back pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies. The NuVasive Modulus TLIF Interbody System can be used as an adjunct to fusion in patients diagnosed with multilevel degenerative scoliosis.

**F. Technological Characteristics**

As was established in this submission, the subject *NuVasive Modulus TLIF Interbody System* is substantially equivalent to other predicate devices cleared by the FDA for commercial distribution in the United States. The subject device was shown to be substantially equivalent and have the same technological characteristics to its predicate devices through comparison in areas including design, intended use, material composition, and function. This device does not contain software or electrical equipment.

**G. Performance Data**

Non-clinical testing was performed to demonstrate that the subject *NuVasive Modulus TLIF Interbody System* is substantially equivalent to other predicate devices. The following testing was performed:

- Static Compression (per ASTM F2077)
- Dynamic Compression (per ASTM F2077)
- Static Compression Shear (per ASTM F2077)
- Dynamic Compression Shear (per ASTM F2077)
- Gravimetric and Particulate analysis (ASTM F1714 and F1877)
- Push-out (per ASTM F04-25-02-02 Draft)
- Subsidence (per ASTM F2267)
- Bacterial endotoxin testing (BET) per ANSI/AAMI ST72:2011/(R)2016

The results demonstrate that the subject *NuVasive Modulus TLIF Interbody System* meets the same criteria as the predicate devices, and the subject device was therefore found to be substantially equivalent to the predicate. No clinical studies were conducted.

**H. Conclusions**

Based on the indications for use, technological characteristics, and comparison to predicate devices, the subject *NuVasive Modulus TLIF Interbody System* has been shown to be substantially equivalent to legally marketed predicate devices.