Synergy Imaging

Revolutionizing Surgical Imaging



Arthrex® Endoscopy





05	Synergy Vision™ Imaging System
07	High Dynamic Range
07	Synergy Vision Connect™ Console
09	Fluorescence Imaging
09	Synergy Vision Tablet
11	Cancer Illumination™ Visualization
12	Synergy Exoscope
13	Synergy Vision™ System: Additional Features
14	Nano Endoscopy: The Next Generation of Endoscopic Imaging Is Here
15	NanoNeedle™ Scope Visualization System
17	Nano Vision™ Functionality
18	Richard Wolf Medical Instruments Corporation, USA
19	Skytron


4K
Synergy
Insufflation: High Flow
15
Stop
20

Synergy Vision™ Imaging System

Experience the Synergy Vision imaging system. This next generation of all-in-one visualization features high dynamic range (HDR), 4K imaging, NanoNeedle™ scope compatibility, fluorescence imaging, and video integration in a single console. Arthrex innovation is once again Helping Surgeons Treat Their Patients Better®.

Key Features and Benefits

The Synergy Vision system is the next step in the evolution of surgical video. This new visualization system combines and expands on the capabilities of multiple legacy Synergy technologies, including the Synergy*ID*™ imaging system, the NanoNeedle scope, and Synergy Matrix™ Core integration.

Nano Vision™ Functionality
The NanoNeedle scope integrates directly to the Synergy Vision console as either a primary or secondary view and offers simultaneous 4K and Nano visualization on the same screen.

HDR
Experience enhanced contrast of surgical anatomy and ideal visualization with HDR.

Synergy Vision Connect™ Console
Featuring 6 inputs and 4 outputs, the Synergy Vision Connect system offers built-in OR integration capabilities for in-room switching and routing.

Fluorescence Imaging
Switch to fluorescence 4K imaging, available in multiple NIR modes and colors, with the touch of a button.

32 in HDR surgical display	AR-3250-3212
Synergy Vision console	AR-3200-0026
Synergy Visionary™ camera head	AR-3210-0034
Synergy Vision camera head	AR-3210-0035





High Dynamic Range

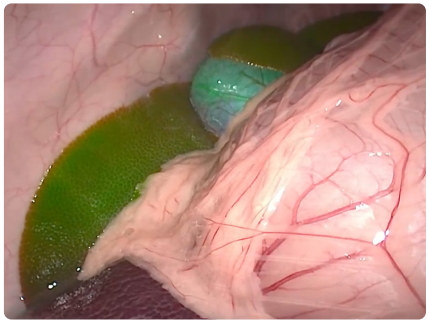
The Synergy Vision™ imaging system offers the latest in imaging quality, including high dynamic range (HDR). HDR optimizes the way in which light is processed, producing images in greater detail and improved contrast over non-HDR imaging, ultimately offering enhanced surgical imaging.

A 32-in 4K IPS LCD surgical display supports HDR10 and features backlit output stabilization with continuous, even brightness. This ensures the stability of the LCD backlight, making image viewing thorough and clear even over extended periods of time.

32 in HDR surgical display	AR-3250-3212



Visualization without HDR*



Visualization with HDR*

Synergy Vision Connect™ Console

Explore the world's first imaging console with built-in video integration. A pioneer in visualization, Arthrex designed the Synergy Vision Connect system with a variety of capabilities, including:

- 6 video inputs and 4 unique video outputs allow for in-room surgical video routing; can be routed to surgical displays, captured, or composited to create new surgical views
- Generate a variety of distinctive views, including picture-in-picture (PIP), picture-by-picture (PBP), and quad-view layouts for routing and capture
- Live visual thumbnail views of all video inputs and outputs ensure streamlined and informed routing

Synergy Vision Connect console	AR-3200-0027
Synergy Vision Connect integration software license	AR-3200-1088

*Porcine Imaging



Fluorescence Imaging

The Synergy Vision™ imaging system combines state-of-the-art 4K visualization with unique augmented reality features, such as fluorescence imaging, to see more than ever before. Designed to offer a range of customizable surgeon preferences, this system enables advanced visualization in virtually any surgical specialty.

Fully integrated near-infrared (NIR) fluorescence imaging allows surgeons to use different modes in all procedures and at any time.

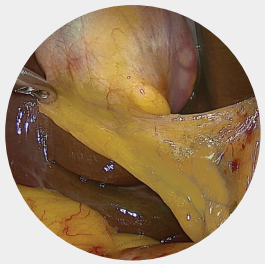
Fluorescence imaging supports multiple modes: fluorescence overlay on full 4K visible light image, fluorescence overlay on grayscale 4K image, and fluorescence image only. All of these modes are easily accessed via the touch of a camera head button.

Laser light source	AR-3200-1018
4K laparoscope, 0°, 10 mm × 330 mm, NIR	AR-3351-1001
4K laparoscope, 30°, 10 mm × 330 mm, NIR	AR-3351-1031
4K laparoscope, 45°, 10 mm × 333 mm, NIR	AR-3351-1046
4K laparoscope, 0°, 5.5 mm × 300 mm, high magnification, NIR	AR-3352-5501
4K laparoscope, 30°, 5.5 mm × 300 mm, high magnification, NIR	AR-3352-5531
4K laparoscope, 45°, 5.5 mm × 302 mm, high magnification, NIR	AR-3352-5546

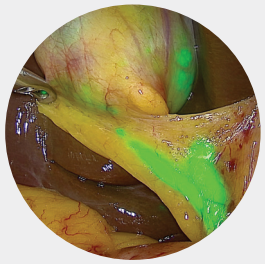
Synergy Vision Tablet

The Synergy Vision imaging system features a unique and innovative medical-grade tablet with an advanced touch interface that allows users to remotely and efficiently enter patient information, surgeon preferences, route video inputs, and adjust image management settings within surgical cases. The Synergy tablet controller promotes reduced costs, shortened OR times, and increased efficiency.

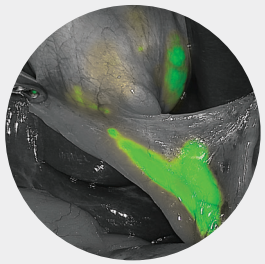
Synergy Vision tablet	AR-3200-1016



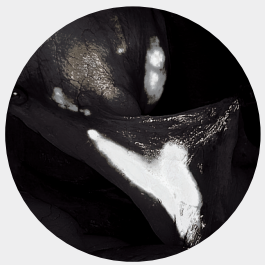
Standard visible light



Standard visible light +
near-infrared (NIR) overlay



Grayscale visible light
+ NIR overlay



NIR only

The Synergy Insufflator

The Arthrex Synergy Insufflator* is designed to deliver CO_2 efficiently across a broad range of laparoscopic procedures. With a high volumetric flow capacity of up to 50 L/min and precise control of pressure and flow, the system consistently maintains a stable pneumoperitoneum to support optimal surgical conditions.



Ease of Use

- Intuitive menu navigation that allows users to concentrate on essential tasks
- Continuous display of pressure, flow rate, and gas consumption
- Four preset modes: Veress, High Flow, Bariatric, Pediatric
- Each mode allows up to 3 savable custom profiles that store individualized settings for pressure and flow

Active Smoke Evacuation System

- Efficiently removes surgical smoke to maintain a clear visual field and a safe operating environment with dual control options to start and stop smoke evacuation via the foot pedal or touchscreen.

Heated Tubing for Gas Warming

- Engineered to match body temperature.

HEPA-Filtered Smoked Evacuation Tubing

- High-efficiency particulate air (HEPA) filter removes 99.999% of potentially unsafe particles in surgical smoke, ensuring safety standards are met to protect both patients and OR staff.

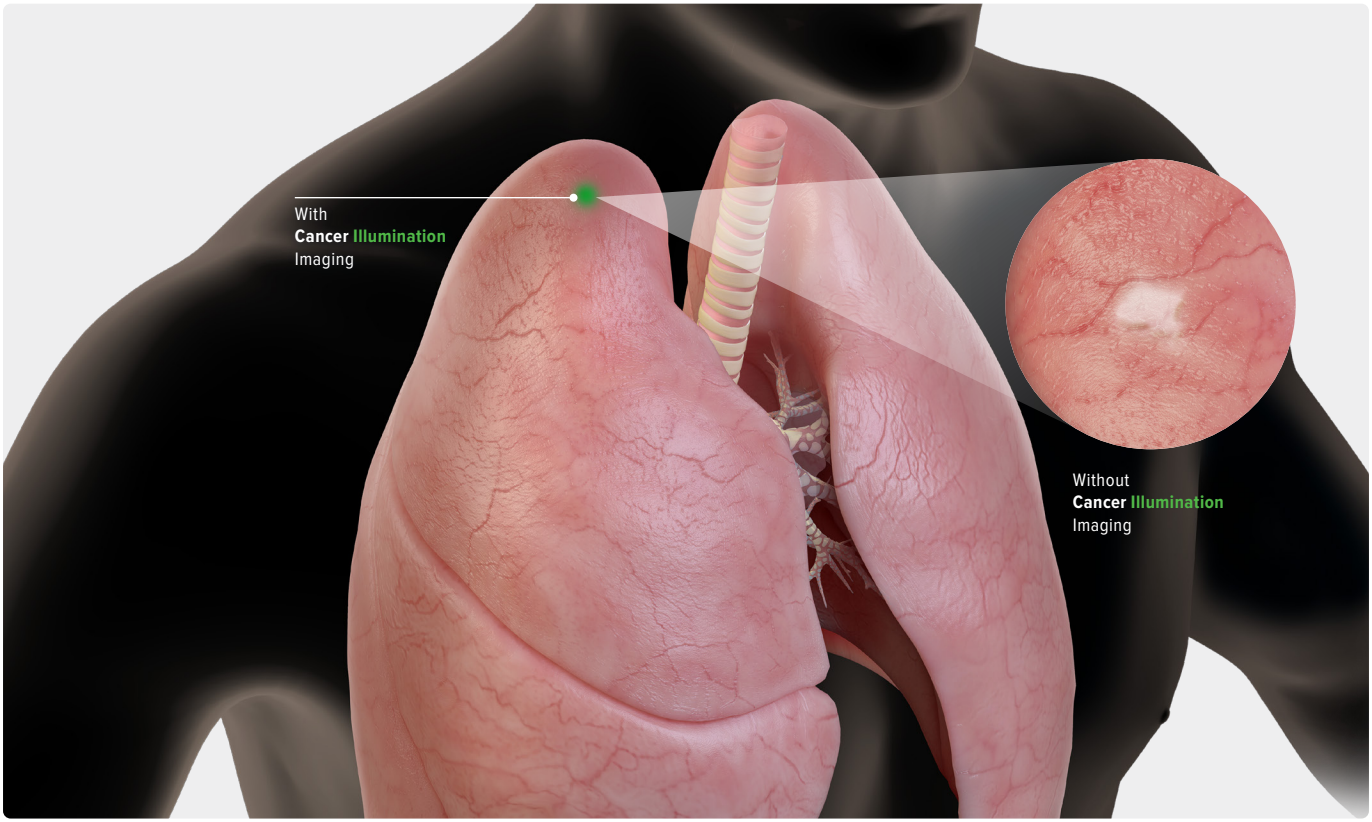
*Investigational device, not available for commercial sale in the USA.

Cancer Illumination™ Visualization

Discover the latest in **Cancer Illumination** visualization. **Cancer Illumination** technology is designed for use with the Synergy Vision™ imaging system and a compatible fluorescent imaging agent. When used with this imaging platform, the agent enables real-time fluorescence visualization of suspicious lung and ovarian cancerous lesions during selected procedures where clinically appropriate.[1,2]

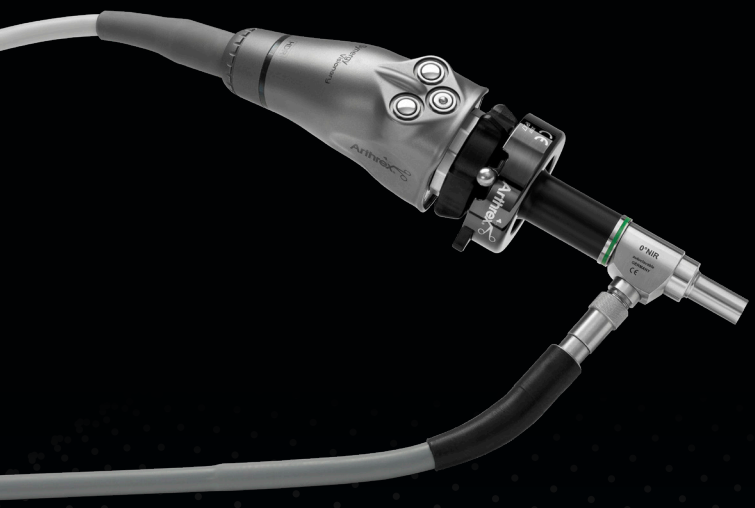
Cancer Illumination imaging provides surgeons with real-time visual information beyond standard endoscopic imaging. By illuminating suspicious tissue during specific procedures, this technology helps identify areas of interest and supports surgical assessment and decision-making.

Because this technology is accessible directly from the Synergy Vision imaging platform, it fits seamlessly into surgical workflows, enhancing visualization without disrupting efficiency or requiring additional standalone systems.



Synergy Exoscope

The Synergy exoscope is an autoclavable and reusable 0° 4K scope used to provide real-time visible light and near-infrared (NIR) fluorescence imaging during open surgical procedures. With a working distance of 30 cm, the Synergy exoscope connects directly to the Synergy Visionary™ camera head with the Synergy Vision™ imaging system to provide visualization for NIR fluorescence-guided surgery.



The Arthrex Synergy Vision imaging system enables surgeons to perform minimally invasive procedures as well as open surgical procedures using the Synergy exoscope. Together, the Synergy exoscope and Synergy Vision system allow surgeons to use near-infrared fluorescence imaging to visualize vessels, blood flow, and tissue perfusion intraoperatively. Additionally, the near-infrared fluorescence imaging technology can be utilized before, during, and after vascular, gastrointestinal, plastic surgery, organ transplants, and reconstructive surgery, as well as fluorescence imaging and visualization of the lymphatic system, including lymphatic vessels and lymph nodes. Designed for use in the sterile field, it can be operated ergonomically by hand or attached directly to the TRIMANO® system.

Synergy exoscope: 4K open scope, 0 NIR	AR-3352-0050
Synergy camera head holder	AR-3210-0013
Synergy Vision Connect™ system	AR-3200-0027
Synergy Vision system	AR-3200-0026
Synergy Vision tablet	AR-3200-1016
Synergy Visionary camera head	AR-3210-0034
C-mount coupler	AR-3210-0012
Laser light source	AR-3200-1018
Bifurcated light guide	AR-3240-5045
32 in LG HDR monitor	AR 3250-3212
Synergy cart	AR-3260-0001
TRIMANO 4K camera head holder	AR-3210-0011
TRIMANO FORTIS® support arm	AR-1740
TRIMANO FORTIS adapter	AR-1741

TRIMANO and TRIMANO FORTIS are trademarks of Maquet GmbH.

Synergy Vision™ System: Additional Features

The Synergy Vision™ console contains state-of-the-art visualization, fluorescence imaging, LED lighting, image management, and integration in a small footprint. Producing outstanding 4K video for surgeons, this system allows staff to focus on patients instead of equipment through a simple-to-use, tablet-based user interface. Designed to offer a range of customizable surgeon preferences, this system enables advanced visualization in virtually any surgical specialty.

In addition to the other features detailed in this brochure, the Synergy Vision system offers the following features and benefits:

- Capture and automatically export 4K stills and video to multiple destinations, such as a network share, PACS, the Synergy Surgeon™ app, Synergy.net™ software, and SurgeonVault® system
- Live, secure video streaming to authorized users with intraoperative messaging
- Built-in wired and wireless network connectivity
- Heads-up display to keep the surgeon informed of imaging, shaver, pump, insufflator, and RF settings throughout the procedure
- Software-based solution, allowing for the easy addition of new functionality over the life of the system
- Built-in LED light source with a 30,000-hour warranty
- Unique augmented reality features and image enhancement functionality that help optimize visualization
- System control provided via easy-to-learn user interface on tablet
- Programmable individual surgeon/procedure preferences, which reduce system setup time and ensure surgeons have a consistent experience from case to case
- On-screen guided surgical timeout

This revolutionary system also offers unparalleled 4K white light visualization featuring:

- Increased dynamic range and depth of light for unrivaled contrast and even distribution of light
- Unsurpassed depth of field for optimal sharpness from the front to the back of the image
- Brand-new imaging modes for white light color augmentation
- 4 times the number of pixels as HD and a multisensory camera design for increased resolution and a stunning depth perception
- 10-bit color for precise color reproduction
- Direct LED integration with the 4K visualization system for maximum performance

In addition, the next-generation Synergy video cart was designed and developed with the latest ergonomics in mind to outfit even the largest operating rooms. This unique cart features a number of customizable configurations, including dual-monitor capabilities to optimally support the Synergy Vision system outputs.





Nano Endoscopy: The Next Generation of Endoscopic Imaging Is Here

The state-of-the-art NanoNeedle™ scope operative endoscopy system uses high-definition, chip-on-tip, image sensor technology to provide surgeons with a needle-sized, single-use camera system. Using the portable imaging system, surgeons can choose minimally invasive endoscopy in the operating room using the NanoScope system or the Synergy Vision™ imaging system with the NanoNeedle scope as the main camera or as an adjunct to a traditional camera in a treatment room or in the physician's office.

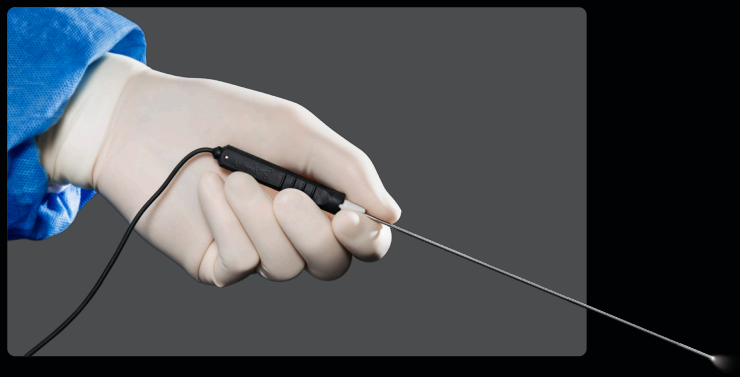
A pioneer in Nano endoscopy, Arthrex has created the next generation of NanoNeedle scope Visualization.

Designed to be a significant improvement in surgical imaging ergonomics and visualization quality, the NanoNeedle scope is an alternative and minimally invasive option compared to traditional endoscopy.

NanoNeedle™ Scope Visualization System

The NanoNeedle visualization system is a medical-grade, 3-in-1, chip-on-tip disposable camera system. With an intuitive tablet control unit, the system features the latest technologies in 1 mm imaging sensors, LED lighting, image management, and OR integration. A network-based system allows for bidirectional communication to your facility EHR, PACS, Synergy Surgeon™ app, and SurgeonVault® system.





NanoScope™ Console Specifications

- Medical-grade camera control unit and camera card edge
- 13”, 3-in-1 camera control unit
- Network capabilities to connect to facility’s EHR, PACS, and Synergy Surgeon app
- Built-in microphone for video dictation
- HDMI output to extend the video signal to in-room displays and integration systems
- Printing capabilities and brightness adjustment

Synergy Vision™ Console Specifications

- Medical-grade camera control unit and camera card edge
- 32” HDR surgical display
- Network capabilities to connect to facility’s EHR, PACS, and Synergy Surgeon app

NanoNeedle Scope 1.0

- 400 × 400 resolution with 120° field of view
- 5 mm × 50 mm depth of field
- 125 mm, 180 mm, and 250 mm lengths
- Compatible with NanoScope console and Synergy Vision console

NanoNeedle Scope 2.0

- 720 × 720 resolution with 120° field of view
- 5 mm × 50 mm depth of field
- 125 mm, 180 mm, and 250 mm lengths
- Compatible with Synergy Vision console

Economic Impact

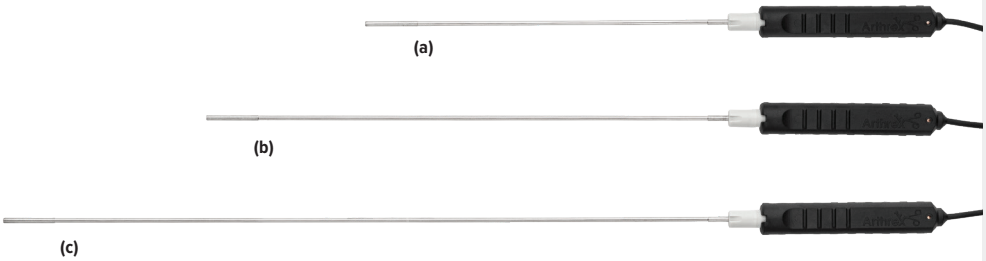
Nano endoscopy is a cost-effective alternative to standard endoscopic imaging. A single-use camera component eliminates procedure delays due to equipment cleaning, processing, and sterilization without costly maintenance, repairs, or upgrades related to traditional video stacks. The minimally invasive approach and unlimited access to difficult-to-visualize spaces make the NanoNeedle™ scope the instrument of choice for less invasive endoscopic procedures.

Tablet Control Unit Components

- 13 in HD monitor
- Handpiece connector
- Microphone
- Ethernet, USB, and HDMI ports

NanoNeedle Scope Standard Lengths

- 250 mm
- 180 mm
- 125 mm



NanoNeedle scope, 125 mm, single-use **(a)**	AR-3210-0043
NanoNeedle scope, 180 mm, single-use **(b)**	AR-3210-0044
NanoNeedle scope, 250 mm, single use **(c)**	AR-3210-0045
NanoScope™ tablet control unit	AR-3200-0030
Mobile cart **(d)**	AR-3502-CRT
NanoScope console battery supply replacement	150-0012-00-A
NanoNeedle scope 2.0, 125 mm	AR-3210-0070
NanoNeedle scope 2.0, 180 mm	AR-3210-0071
NanoNeedle scope 2.0, 250 mm	AR-3210-0072



NanoScope Console Cart

Height-adjustable with power supply and cable management features

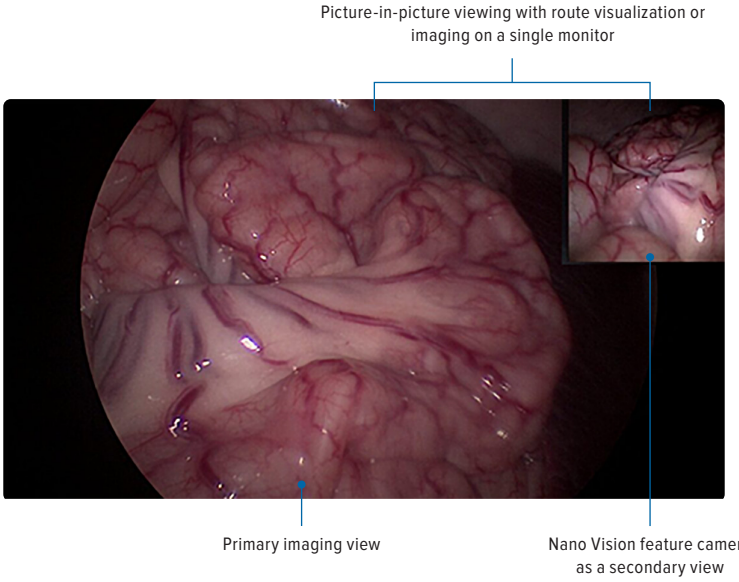
Nano Vision™ Functionality

The Synergy Vision™ imaging system, via a built-in port to connect a NanoNeedle™ scope, supports Nano Vision functionality, which supports 4K and Nano visualization simultaneously, giving surgeons access to additional views and allowing them to see more of the anatomy than with a traditional single-camera view.

Key Features and Benefits

Nano endoscopy offers a variety of benefits, including:

- Customized anesthetic options (eg, light sedation vs general anesthetic)
- Appropriate for a variety of settings, including procedure rooms, hospitals, surgery centers, etc
- Same-day diagnostic and surgical treatment options
- Potential to reduce facility costs
- Opportunity to redirect or increase cases in underused treatment and procedure rooms
- Ability to decrease or eliminate medical workup, monitoring, and general anesthetic complications
- Picture-in-picture viewing with the ability to visualize both a traditional laparoscopic view and the NanoNeedle scope imaging on a single monitor
- Proven, improved outcomes and satisfaction scores regarding patient-surgeon interactions[3,4]
- Ancillary surgical views not seen with a single 4K camera



Richard Wolf Medical Instruments Corporation, USA

Arthrex and Richard Wolf, global leaders in minimally invasive surgical technology and solutions, announced a U.S.-based partnership to offer comprehensive technology and product offerings in urology, gynecology, and general surgery.

Richard Wolf is a full-service provider in endoscopy, offering a wide range of instrumentation and system solutions for minimally invasive medicine. With more than 16 subsidiaries and 130 distributors, Richard Wolf meets the needs of surgeons, medical professionals, and patients with high-quality, precise endoscopic instruments.

Arthrex and Richard Wolf are united in their missions to advance health care and improve patient outcomes. Through this partnership, health care professionals in the US will experience a comprehensive and complementary line of surgical solutions within general surgery in a single package, including operating room integration, 4K image clarity with fluorescence imaging, advanced insufflation, specialized endoscopic instrumentation, and comprehensive reprocessing modalities.



General Surgery
Instrumentation design is based on the principles of quality, precision, ease of handling, and patient safety.

Gynecology
Slim, all-in-one hysteroscope and a full line of hysteroscopic and laparoscopic instrumentation.

Urology
Offering urological solutions for cystoscopy, resection, ureteroscopy, nephroscopy, and laser enucleation.



Skytron

Arthrex and Skytron have joined forces to offer a comprehensive array of total room solutions designed to address the future needs and challenges of operative care facilities.

Considered a total-room solution, this partnership provides capital equipment, architectural systems, and real-time clinical business intelligence for surgical, sterile processing, and inpatient settings. Furthermore, it allows Arthrex and Skytron to offer facilities complete turnkey operative solutions with bundled products. As trusted global leaders, this partnership also aligns and streamlines each company's US offerings to better serve the needs of customers and ensure a keen focus remains on improving surgical quality and patient care.

As global leaders in medical device manufacturing and surgical technology, Arthrex and Skytron can integrate their products and procedures into hospitals and surgery centers, providing more access to a wide array of surgical options.

In addition, the partnership simplifies purchasing as facilities are able to incorporate comprehensive solutions from two companies into a single transaction.

- **Clinical**
  Including clinical lighting, surgical tables, storage solutions, and equipment booms
- **Sterile Processing**
  Lower cost of ownership, smaller footprint, lower water usage, and shorter cycle times
- **Clinical Business Intelligence**
  Enhanced workflow, real-time support, improved performance, and intelligent solutions
- **Architectural and Environmental**
  Customed design, hygienic environments, quick installation times, and long-term vision

For more information, visit Skytron.com

References

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3. Colasanti CA, Mercer NP, Garcia JV, Kerkhoffs GMMJ, Kennedy JG. In-office needle arthroscopy for the treatment of anterior ankle impingement yields high patient satisfaction with high rates of return to work and sport. *Arthroscopy.* 2021;S07498063(21)00848-3. doi:10.1016/j.arthro.2021.09.016
4. Murawski CD, Kennedy JG. Anteromedial impingement in the ankle joint: outcomes following arthroscopy. *Am J Sports Med.* 2010;38(10):2017-2024. doi:10.1177/0363546510369335



This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's directions for use. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

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