

Synergy Imaging

Revolutionizing Surgical Imaging



Arthrex Endoscopy





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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^{HD}™ 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

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



Visualization without HDR*



Visualization with HDR*

*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.

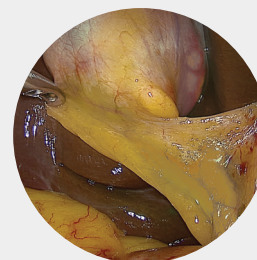
Fluorescence imaging supports multiple modes: fluorescence overlay on full 4K visible light image, fluorescence overlay on grayscale 4K image, and fluorescence image only. All of these modes are easily accessed via the touch of a camera head button.

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| 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 |

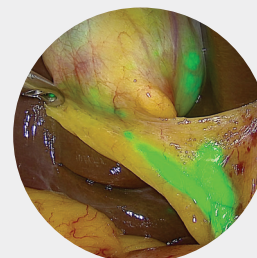
Synergy Vision Tablet

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.

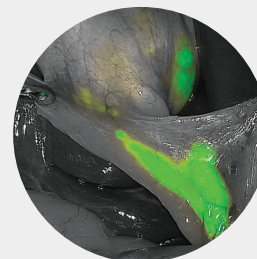
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| Synergy Vision tablet | AR-3200-1016 |
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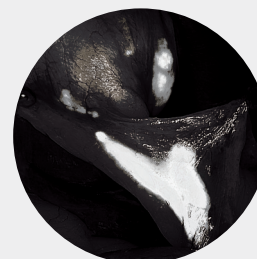
Standard visible light



Standard visible light +
near-infrared (NIR) overlay

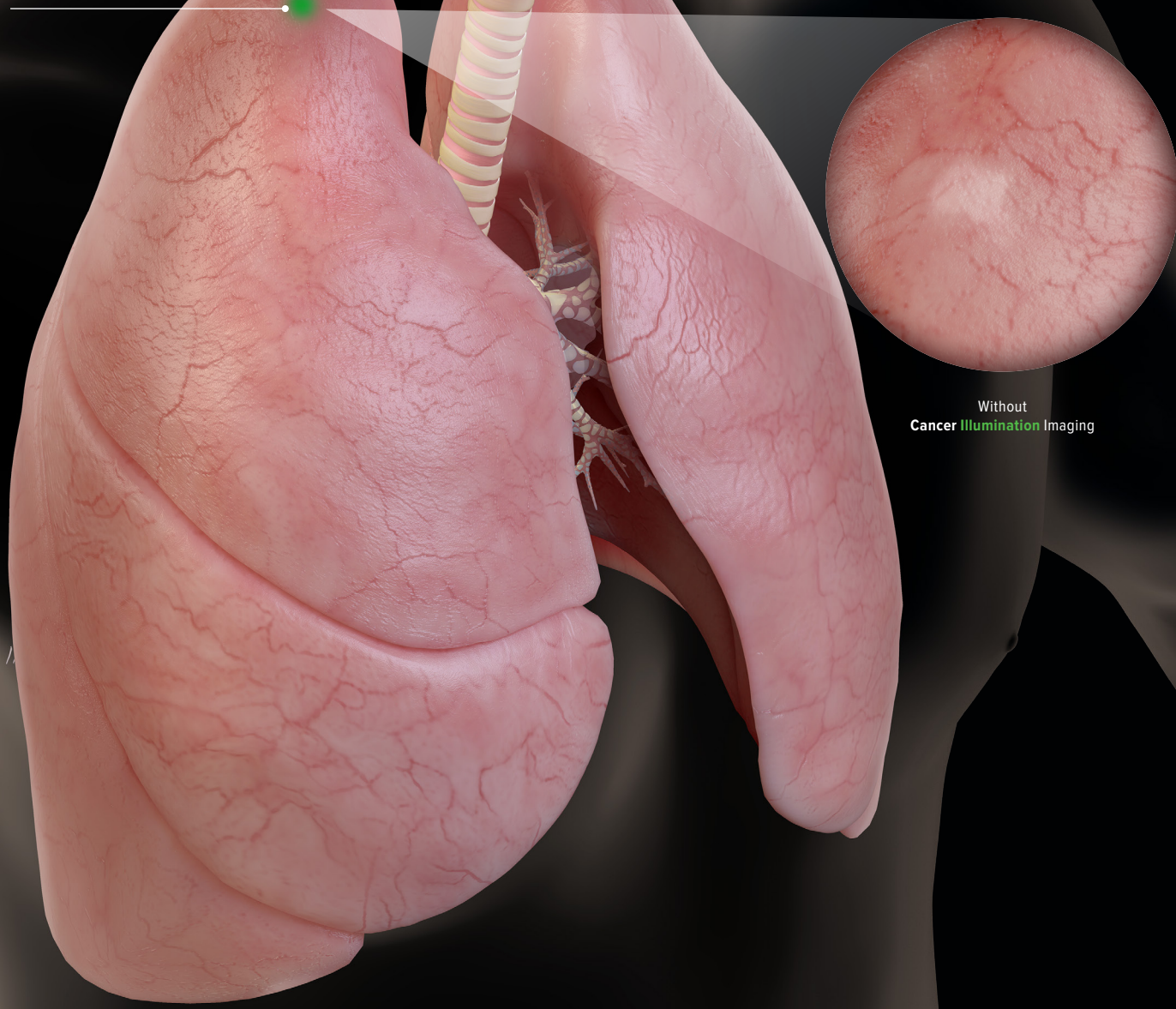


Grayscale visible light
+ NIR overlay



NIR only

With **Cancer Illumination™**
Imaging



Without
Cancer Illumination™ Imaging

Cancer Illumination™ Visualization

Discover the latest in imaging advancements with **Cancer Illumination** visualization. Using the Synergy Vision™ imaging system, now cleared for use with CYTALUX® (pafolacianine) injection, an FDA-approved prescription medication, surgeons can now visualize cancerous lesions that may have otherwise gone undetected.

CYTALUX is administered to patients intravenously prior to surgery. It contains a folic acid analog conjugated with a fluorescent dye that, when circulated through the body, binds to folate receptors overexpressed on lung and ovarian cancer cells. These cells take in the drug through the receptors and are then illuminated using the Synergy Vision system, allowing surgeons to visualize the fluorescent lesions in real-time during surgery.

CYTALUX for Lung Cancer

CYTALUX, when paired with near-infrared imaging, has been shown to identify lesions that were unable to be detected or otherwise localized using standard techniques in 19% of patients.¹ This allows surgeons to make more informed decisions based on the visualization achieved with CYTALUX.

CYTALUX for Ovarian Cancer

In clinical trials, when used with a near-infrared surgical camera, CYTALUX has been proven to detect additional cancerous lesions in as many as 27% of patients.² By combining this medication with the Synergy Vision system, surgeons are now able to better visualize these lesions, allowing them to make more informed treatment plans.

How Does Cancer Illumination Visualization Work?



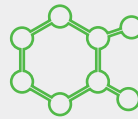
IV Administration

Administer CYTALUX intravenously to patients prior to surgery.



Allow for Circulation

Perform surgery between 1 and 24 hours after IV administration for lung cancer procedures and 1 and 9 hours after IV administration for ovarian cancer procedures.



Allow CYTALUX to Work

CYTALUX contains a folic acid analog that binds to folate receptors present on lung and ovarian cancer cells.

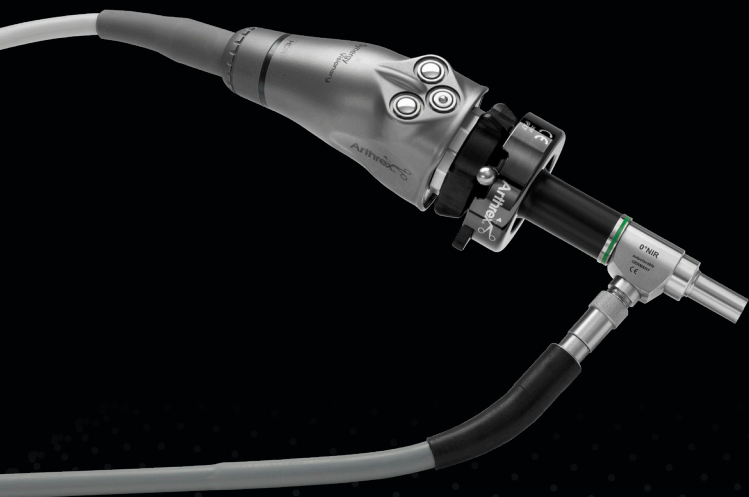


Perform Procedure With Synergy Vision System

Use the Synergy Visionary™ camera head in NIR mode to visualize CYTALUX to detect where cancerous cells exist.

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.

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| 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

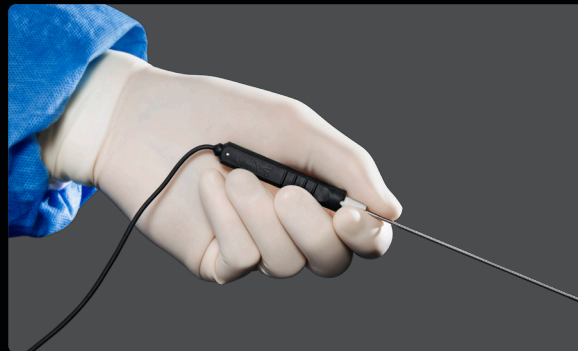
The state-of-the-art NanoNeedle™ scope operative endoscopy system uses high-definition, chip-on-tip, image sensor technology to provide surgeons with a needle-sized, single-use camera system. Using the portable imaging system, surgeons can choose minimally invasive endoscopy in the operating room using the NanoScope™ system 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

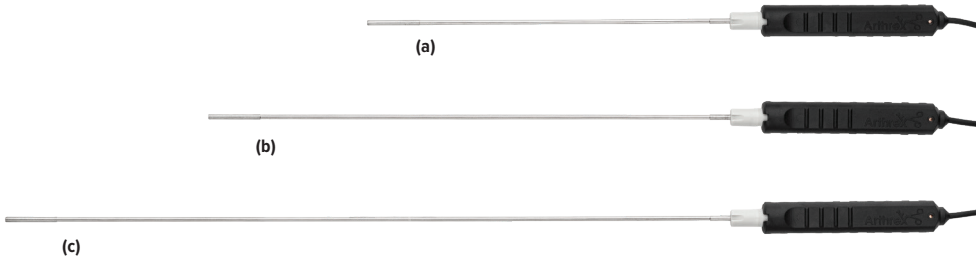
Nano endoscopy is a cost-effective alternative to standard endoscopic imaging. A single-use camera component eliminates procedure delays due to equipment cleaning, processing, and sterilization without costly maintenance, repairs, or upgrades related to traditional video stacks. The minimally invasive 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

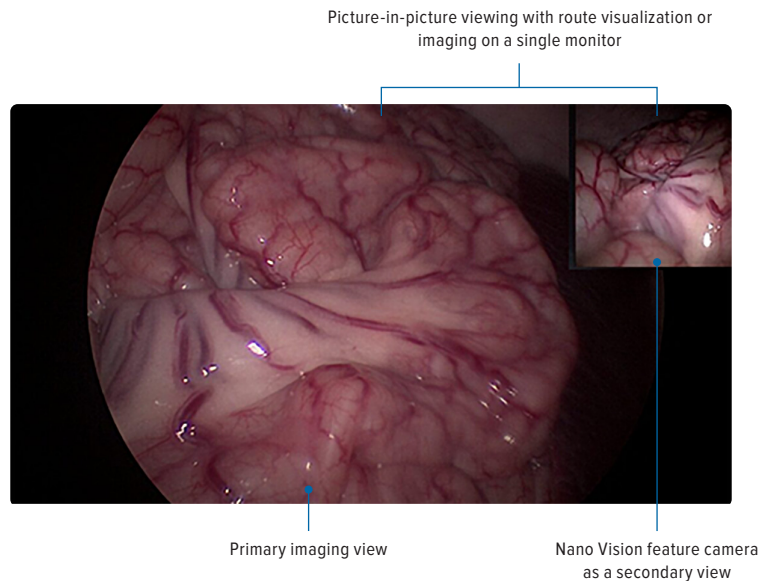
Nano Vision™ Functionality

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**

Customized design, hygienic environments, quick installation times, and long-term vision

For more information, visit [Skytron.com](https://www.skytron.com)

References

1. On Target Laboratories. Cytalux for Lung Cancer. Accessed August 28, 2024. <https://cytalux.com/cytalux-for-lung-cancer/>
2. On Target Laboratories. Cytalux for Ovarian Cancer. Accessed August 28, 2024. <https://cytalux.com/cytalux-for-ovarian-cancer/>
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