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eV14-2v endocavitary transducer

One-transducer solution for high-performance GYN, OB and early fetal cardiac imaging

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This white paper examines the PureWave acoustics and other advances of the Philips eV14-2v one-transducer solution for endocavitary imaging, including the combination of penetration and resolution that supports diagnostic confidence even in complex cases.

Overview

The eV14-2v is the latest Philips 3D endocavitary transducer, incorporating the most recent generation of Philips PureWave technology to deliver high-performance[1] imaging across GYN, OB and early fetal cardiac applications. It is the first Philips PureWave mechanical 3D transducer to combine multi-elevation focus stripes within a single endocavitary transducer, allowing for outstanding imaging performance without the need to switch transducers.

The growing recognition of the importance of transvaginal ultrasound

Endometriosis affects approximately 10% of reproductive-age women worldwide,[2] and diagnosis is frequently delayed by several years,[2,3] creating a strong need for earlier, noninvasive evaluation pathways. Transvaginal ultrasound is increasingly recognized as a first-line imaging modality in suspected endometriosis[4] because it is accessible, noninvasive and capable of detecting ovarian endometriomas and many forms of deep infiltrating endometriosis with clinically useful accuracy while also supporting preoperative disease mapping.[5]

The power of second-generation PureWave crystal technology comes to endovaginal ultrasound systems

By integrating advanced PureWave acoustics with a high-element-density multi-row array, a triple matching-layer acoustic design, the eV14-2v delivers a wider field of view, improved penetration and enhanced near-field resolution compared to prior-generation Philips endocavitary transducers.[1] Advanced harmonics and intelligent image processing help recover deep structures while preserving fine anatomical detail, allowing clinicians to image confidently across a broad range of patient anatomies while helping to maintain image quality.

Key highlights of the eV14-2v

- Advanced imaging that offer both penetration and resolution to support diagnostic confidence
- Expanded field of view cover more anatomy
- Improved ergonomics and workflow to streamline daily practice
- Available on EPIQ Elite and Alturion ultrasound

Built for fast, consistent exams

Designed with workflow and usability in mind, the eV14-2v features improved ergonomics and optimized clinical presets that reduce the need for manual on-cart adjustments. This supports faster, more consistent exams and allows clinicians to focus on interpretation rather than image optimization. A single transducer supports robust 2D, 3D and 4D imaging in all modes across gynecologic, early obstetric and early fetal heart applications, helping streamline daily practice. 3D/4D imaging offers users access to all anatomical planes, especially the important coronal plane of the uterus that is limited by 2D imaging alone.

Together, the transducer and its underlying acoustic and image-processing technologies enhance visualization of both superficial and deep pathology, supporting improved detection of conditions such as deep infiltrating endometriosis and allowing for confident early fetal screening.

Advanced imaging in a one-transducer solution

The eV14-2v combines the latest generation of PureWave single-crystal acoustics, a triple matching-layer design and a multi-row architecture to broaden bandwidth, improve sensitivity and support both penetration and near-field detail within the same endocavitary transducer.

Together with xRes Pro+,* 2D Auto Scan and AdaptiveIQ Pro,* this transducer architecture supports high-resolution 2D and 3D/4D imaging across gynecologic pelvic imaging, early obstetric assessment and early fetal cardiac evaluation, where small structures and fine tissue interfaces must be visualized consistently across depth. This is particularly relevant in early fetal cardiac imaging because congenital heart malformations remain challenging to detect prenatally, and diagnostically important anatomy is small, rapidly moving and technically demanding to visualize. In this setting, higher spatial resolution together with improved penetration can support more reliable visualization of chambers, outflow tracts and blood-flow patterns during early fetal cardiac assessment.

Improved penetration across both superficial and deep anatomy reflects the combined effect of the transducer design and the image-processing pipeline, allowing deeper structures to be visualized without losing diagnostically important near-field detail.

Within the image-processing pipeline, AdaptiveIQ Pro blends harmonic and fundamental information to balance penetration and resolution, while 2D Auto Scan continuously manages bright reflectors and low-level grayscale detail. Together, these tools help preserve image interpretability when anatomy extends from the near field into deeper pelvic structures.

xRes Pro+ on EPIQ Elite combines line-space and pixel-space processing to improve image quality in the curvilinear imaging format. Line-space processing operates in the native beam geometry, making it well suited to suppress angle-dependent speckle, stabilize echo continuity between adjacent lines and reduce the visual effects of line spreading that become more apparent with depth. Pixel-space processing is then applied after scan conversion to refine local contrast transitions and reinforce tissue boundaries independent of beam direction, improving border delineation while preserving a natural grayscale appearance.

At the transducer level, these latest-generation PureWave single-crystal acoustics and triple matching-layer design improve bandwidth and sensitivity by increasing electromechanical efficiency and reducing acoustic impedance mismatch at the transducer–tissue interface. The result is broader usable frequency response, stronger signal return and improved support for both near-field detail and deeper signal recovery.

The multi-row architecture also incorporates multiple elevational focus stripes, creating near-field and far-field elevational focal zones within the transducer. In gynecologic imaging, this supports multiple simultaneous focal zones that help maintain a narrow slice thickness across more of the image depth, preserving elevational resolution and reducing partial-volume effects from superficial structures through deeper pelvic anatomy. This is particularly relevant in suspected endometriosis, where diagnostically important findings may span subtle near-field interfaces, ovarian structures and deep infiltrating disease in the posterior pelvis.

Enhanced color sensitivity complements structural imaging by improving visualization of small vessels and low-velocity flow in gynecologic applications and early fetal circulation.

Expanded field of view

The eV14-2v provides a 180° 2D field of view and a 120° sweep angle, increasing anatomic coverage in both native imaging and volume acquisition. This broader coverage is particularly useful when the clinical question extends across the uterus and surrounding pelvic anatomy.

In 2D imaging, the 180° field of view supports more complete visualization of the uterus from external os to fundus, together with adjacent pelvic anatomy, within a single plane. During volume acquisition, the 120° sweep angle helps capture complete uterine contour and surrounding relationships in a single dataset, which is useful in enlarged uteri, fibroids, congenital uterine anomalies, uterine, fallopian tube-ovary spatial relationships in sonohysterography and cases with distorted anatomy.

eV14-2v compared to the predecessor 3D9-3v transducer

Greater depth

41.7% increase in penetration,[1] which can be beneficial when imaging dense masses such as fibroids and for visualizing deep infiltrating endometriosis

More clarity

10% increase in 2D resolution[1] for the fine detail necessary to support confident diagnosis for conditions such as ovarian cancer

Larger FOV

15.8% improvement in FOV[1] to see full pelvic anatomy in a single image

Lighter

22% lighter,[1] enhancing ergonomic comfort when scanning

*Available only on EPIQ Elite

Next-generation image processing

xRes Pro+ processing and adaptive imaging on EPIQ Elite extend the acoustic performance of the transducer by improving contrast handling, border definition and visualization of subtle anatomy from the near field through deeper structures.

AdaptiveIQ Pro continuously analyzes image data in real time and balances harmonic and fundamental information to optimize the tradeoff between resolution and penetration for the specific patient and anatomy being scanned. This supports recovery of deeper structures while preserving fine detail when anatomy extends across multiple depth zones.

In gynecologic imaging, these processing tools are particularly useful when both near-field and far-field performance must be maintained within the same examination, including assessment of endometriosis, enlarged fibroid uteri and deep pelvic pathology.

Benefits in suspected endometriosis

Suspected endometriosis places simultaneous demands on near-field resolution and far-field performance. High spatial resolution in the near field is important for delineation of subtle tissue interfaces, ovarian morphology and small lesions, while preserved penetration and contrast resolution at depth are needed to evaluate deep infiltrating disease in the posterior pelvis and other deep compartments. Because disease may be multifocal and anatomy can be distorted by fibroids, adhesions or uterine enlargement, clinically useful imaging also benefits from a wide field of view, strong border conspicuity and sensitivity to low-velocity flow for lesion characterization and disease mapping.

Complementing adaptive imaging, xRes Pro+ applies multi-scale, edge-preserving processing to reduce speckle noise and improve border conspicuity, producing sharper tissue interfaces and more natural anatomical definition, particularly in the mid and far field.

These gains are particularly useful in endocavitary imaging, where anatomy often spans a short standoff region, fine near-field tissue interfaces and deeper pelvic structures within the same field of view. In this setting, line-space processing helps maintain coherence and suppress depth-related line-spread effects in the native curvilinear geometry, while pixel-space processing improves local boundary definition and contrast transitions after scan conversion.

Benefits in transvaginal early obstetric and gynecologic pelvis scanning

Clinically, the combined effect of the new transducer architecture and updated image processing is most apparent in transvaginal early obstetric and gynecologic pelvis scanning, where diagnostically important anatomy often extends from fine near-field interfaces into deeper pelvic structures within the same exam.
For early trimester OB imaging, this technology provides clearer visualization of the gestational sac, yolk sac, embryo, decidual interfaces and early fetal anatomy while maintaining performance at depth when uterine position or patient habitus is challenging. In gynecologic pelvic imaging, the same combination improves delineation of the endometrium, myometrium, adnexal margins and deep pelvic interfaces, supporting evaluation of uterine abnormalities, ovarian pathology and suspected endometriosis.

In early obstetric imaging, these processing benefits also support visualization of fine structures and low-contrast interfaces during first-trimester assessment. xRes Pro+ improves fine-detail rendering and border definition, which is relevant for early obstetric tasks such as nuchal translucency measurement, nasal bone visualization and early anatomic review. AdaptiveIQ Pro helps maintain usable penetration and structure visibility in technically difficult scans, including patients with higher BMI or suboptimal fetal position, where depth performance and preserved contrast are especially important. For improved ergonomics and workflow, the transducer design reduces size and weight while expanding element count and imaging capability, supporting broader clinical use within a form factor intended for routine endocavitary exams.

- A single transducer supports gynecologic imaging, early obstetric exams and early fetal heart assessment, which is important in detecting the most common congenital defect but is often missed, reducing the need to switch probes across related applications.
- Updated 3D/4D workflows and intuitive touchscreen controls simplify volume acquisition and navigation, helping users move efficiently from acquisition to review while maintaining consistent image presentation.
- 4D STIC imaging is supported on OB Early and OB Fetal Heart presets, extending the transducer's role in early fetal cardiac assessment.
- The updated 3D/4D workflow, together with FlexVue and measurement support within FlexVue, can streamline extraction of uterine contour planes and visualization of IUD placement during gynecologic assessment.

eV14-2v helps support diagnostic confidence

Improved 2D image quality[6]

Assess ovaries, uterus and bowel for endometriosis involvement

Improved pulsed wave Doppler image quality[6]

Evaluate uterine and ovarian blood flow

Improved color Doppler image quality[6]

Use color to visualize blood perfusion to ovaries and uterus

Improved 3D MPR image quality[6]

Access definitive coronal views of the uterus

Improved 3D volume image quality[6]

Facilitate 3D evaluation of fetal anatomy

Clinical images using the eV14-2v demonstrate the advanced visualization possible for fetal images **(Figure 1 and Figure 2).**

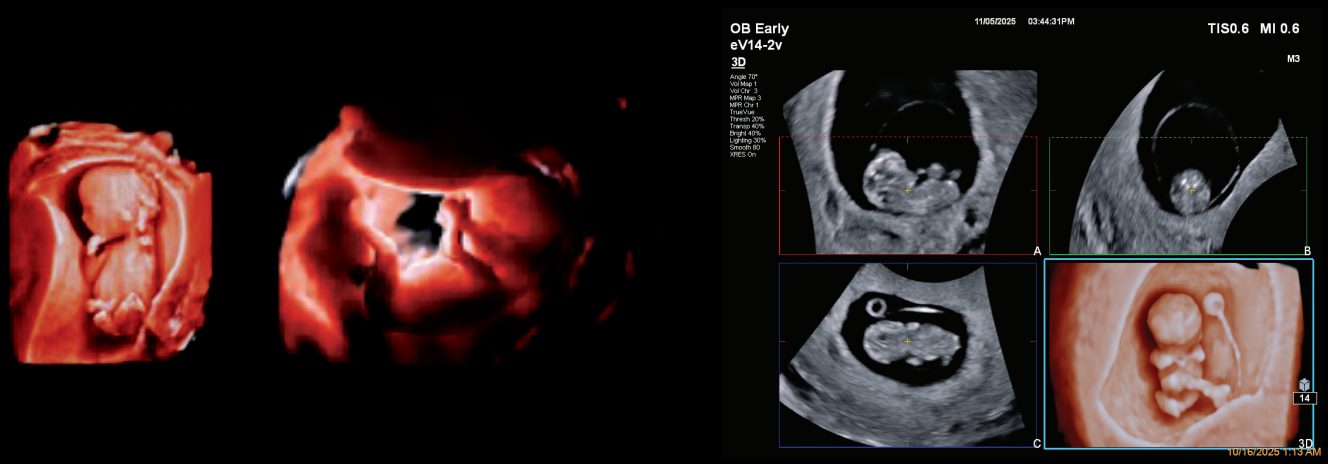

Figure 1 First trimester 3D fetal images highlight the level of detail achieved at an early gestation.

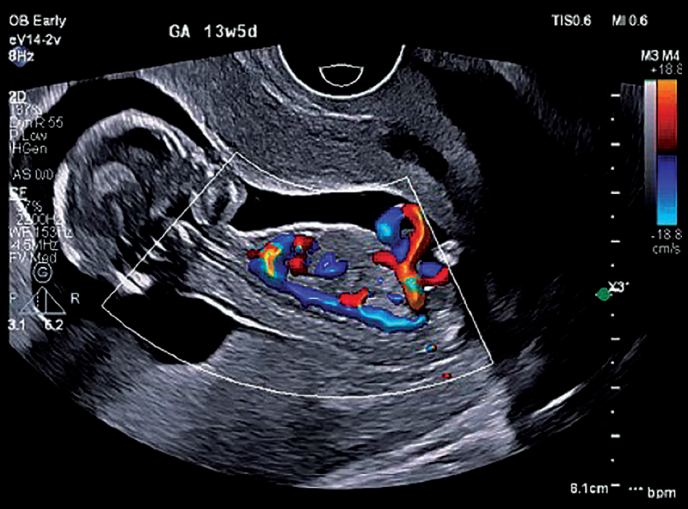

Figure 2 Early fetal anatomy showing complete fetal circulation using color Doppler and Flow Viewer.

The wider field of view of the eV14-2v allows for easier visualization of the entire uterus and surrounding anatomy in the native A-plane, while the wider-angle sweep allows easier acquisition of the C-plane to capture the entire uterine contour **(Figure 3).**

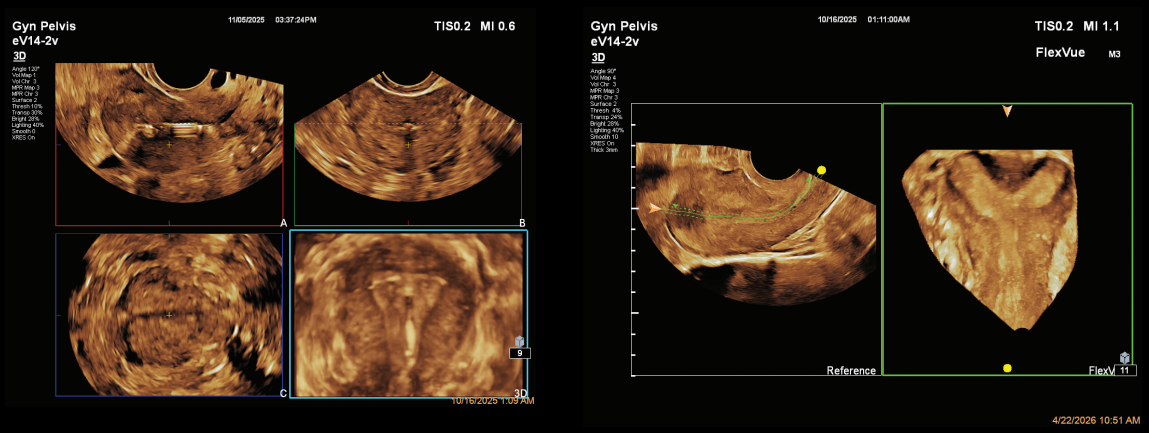

Figure 3 IUD using the eV14-2v (left). The lower right quadrant demonstrates the clarity of the IUD in the volume render image. Right shows a 3D rendered septate uterus using FlexVue.

Figure 4 shows the level of detail and fine resolution throughout the near field and far field of the sagittal view of the uterus. The tri-laminar layers of the endometrium are well delineated. The sensitivity and resolution of MicroFlow Imaging HD (MFI HD) and Flow Viewer capture the smaller low-flow vessels surrounding the ovary.

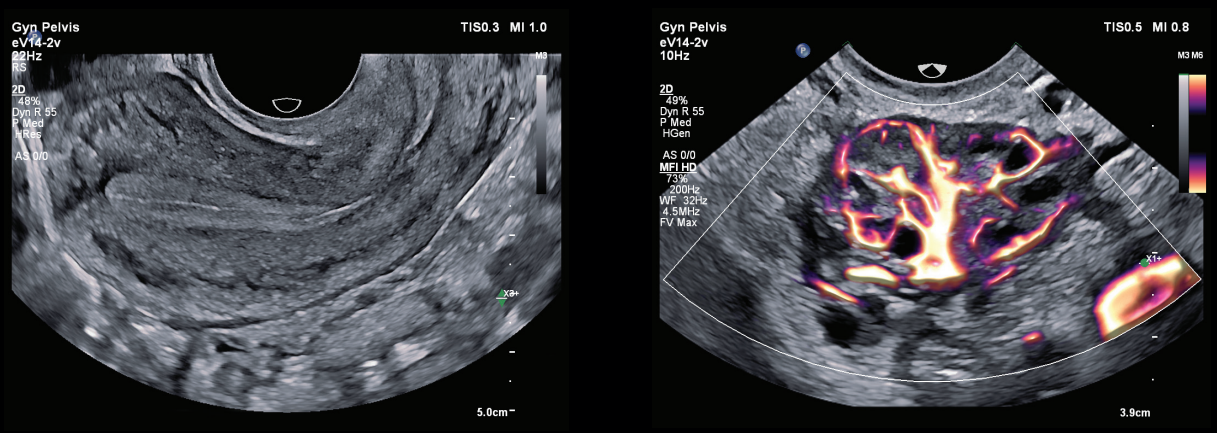

Figure 4 Mid-sagittal view of the uterus (left). Ovary using MFI HD with Flow Viewer (right).

The eV14-2v brings a new level of resolution and sensitivity for all color Doppler modes, which is beneficial in characterizing uterine abnormalities. xRes Pro+ processing enhances fibroid border delineation. Transducer performance allows for the penetration to visualize the surrounding anatomy behind the fibroid **(Figure 5).**

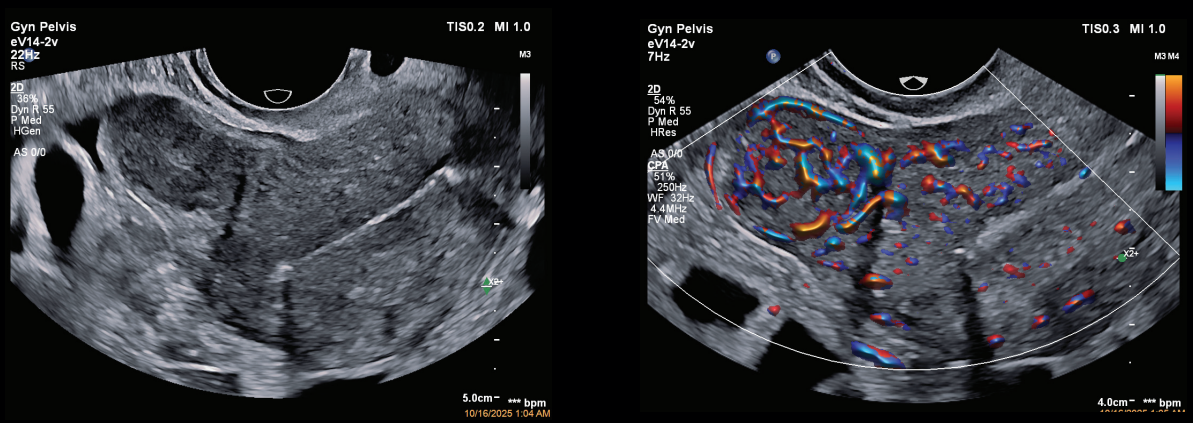

Figure 5 Uterus with pedunculated fibroid and IUD without directional Color Power Angio (CPA) (left) and with directional CPA (right)).

Specification comparison*

Parameter	eV14-2v	3D9-3v (Comparison transducer)
Transducer type	Endocavitary curved linear array	Endocavitary curved linear array
Crystal technology	PureWave	Broadband
Center frequency	6.1 MHz	5.7 MHz
Imaging modes	2D, M-mode, PW Doppler, Color Flow, MFI/MFI HD, STIC, 3D/4D, MPR, Elastography	2D, M-mode, PW Doppler, Color Flow, 3D/4D, MPR, Contrast
3D/4D capability	Yes (mechanical rotation)	Yes (mechanical rotation)
Array configuration	Multi-row curved linear array	Curved linear array
Number of elements	436 elements (2 x 218)	128 elements
Azimuth radius of curvature	10.5 mm	11.5 mm
Default field of view	180°	155°
Max elevational sweep range	120°	85°
Max scan depth	20 cm	16 cm
Axial resolution	0.9 mm	1.0 mm
Penetration	8.5 cm	6 cm
PW Doppler frequency	4.0 MHz	4.0 MHz
Tip diameter	25 mm	26 mm
Shaft length	178 mm	190 mm
Weight (exc. cable)	220 g	282 g
Cable length	2.35 m	2.0 m
Biopsy support	Pending	Yes (CIVCO Verza Guidance System)[7]

*Comparisons on EPIQ Elite GynPelvis preset.

Conclusion

The eV14-2v transducer provides a one-transducer solution for endovaginal ultrasound, allowing clinicians to access both resolution and penetration. This lightweight transducer offers the exceptional image quality to support precise and confident diagnoses from routine scans to complex cases, helping to advance performance in GYN and early OB ultrasound.

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1. Internal documentation: Validation report D001785669. Compared to the 3D9-3v transducer.
2. World Health Organization. Endometriosis. Updated March 31, 2023.
3. As-Sanie S, Black R, Giudice LC, et al. Assessing research gaps and unmet needs in endometriosis. American Journal of Obstetrics and Gynecology. 2019;221(2):86-94.
4. European Society of Human Reproduction and Embryology (ESHRE). Endometriosis guideline. 2022.
5. Guerriero S, Saba L, Pascual MA, et al. Transvaginal ultrasound versus magnetic resonance imaging for diagnosing deep infiltrating endometriosis: systematic review and meta-analysis. Ultrasound in Obstetrics & Gynecology. 2025.
6. Internal documentation: Validation report D001785669. Compared to predecessor transducers 3D9-3v and C10-3v. Results are from a retrospective clinical image evaluation in which clinical experts reviewed images in a blinded manner (n=12 clinical users).
7. CIVCO Verza Guidance System is a trademark of CIVCO Medical Solutions.

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