

MV-Flow™ 3D

Improving microvasculature sensitivity and
enhance spatial comprehension with 3D Volume data

Tips & Tricks

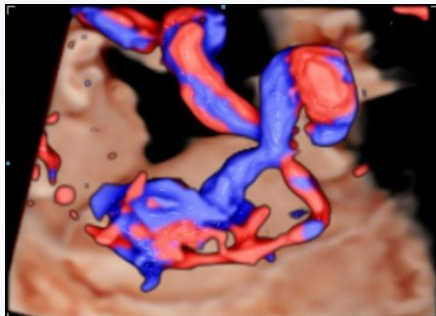
Clinical Values

I Technical & Clinical Benefits

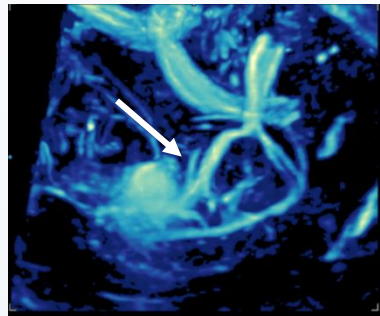
- Detecting the slow blood flow and allowing high resolution of the flow image with MV-Flow™ and supporting to construct it as a 3D Volume.
- Able to analyze and observe more detailed relationship between a specific structure and vascularity than a conventional Color 3D.
- Helps to interpret the ultrasound image by supporting a post-volume reconstruction for research purpose.

I Clinical Cases & Clinical Applications

1st Fetal Circulation : Ductus venosus

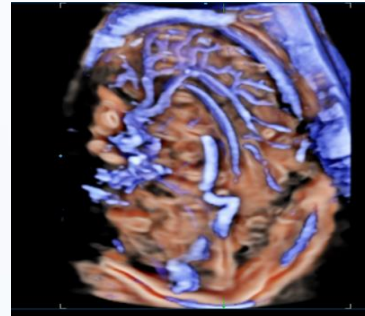


[Color 3D]

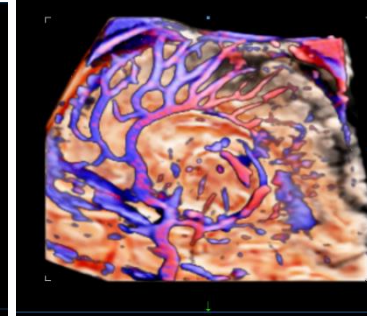


[MV-Flow 3D]

Fetal Brain, Pericallosal Artery



[MV-Flow 3D]



[MV-Flow 3D: Bi-Directional]

Fetal Heart Circulation



- For high-risk pregnancies
 - Abnormally enhanced placenta, demonstrating the imaging results in displaying a Doppler waveform analysis spectrum, vessel profile, blood flow, vessel surface vessels.
- For congenital fetus
 - Fetal Tumors, Fetal Abnormalities, Fetal Pulmonary Abnormalities, Cerebral Vascular Malformations, etc.

Configuration

Checklist

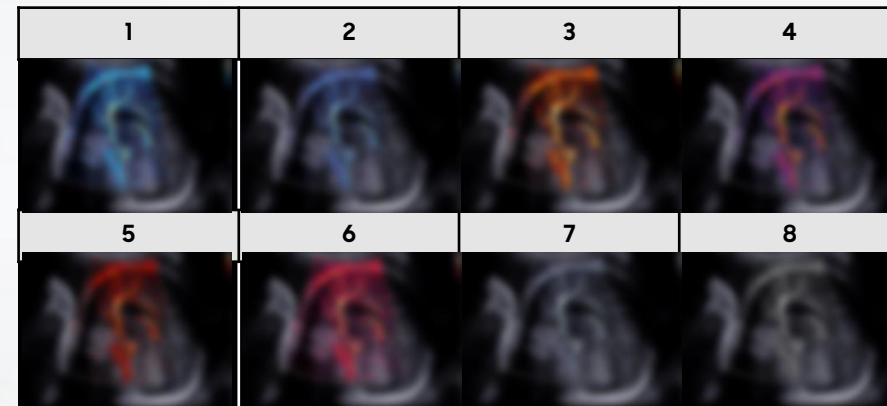
- System: 4000 Series, CTR 4000 Series (V1.00, V1.01, V1.02)
- System: MV-Flow 3D mode - Crystal 3D (optional), Crystal 3D Flow (optional)
- Transducer Application: Phased
 - CTR 4000, CTR 4000 - 2D + 3D Flow, 2D Flow, 3D Flow
 - CTR 4000 - 2D + Address 2 - Cardiac, General, Pericardial, Lung, Prostate
- 4000 resolution is highly recommended (4000 Type System is mostly optional)

Tips & Ticks

01. On 2D MV-Flow™ Mode

- For better vessel visibility
 - Increase 2D Flow volume (Flow may help)
- Make better image from a thick wall/lesion
 - Turn up a few step of Flow suppression
- Shortcut key usage: MV-Flow on/off key
 - You can directly turn on/off the MV-Flow™ through the **off key** while you're looking for the suitable region for 3D volume acquisition.
 - **Off key** - Setup - Customize - Assign MV-Flow on the off key

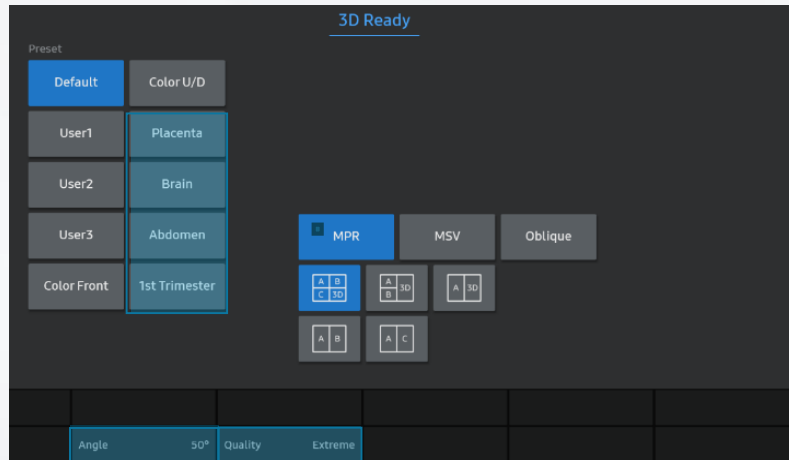
- MV-Flow™ Color palette : 8 colors are prepared in 2D Mode.
 - Blue, orange, red and gray colors are provided. Please refer to the below.



MV-Flow™ 3D

02. Ready to go : MV-Flow™ Mode 3D

- **MV-Flow™ 3D Preset** : Placenta, Brain, Abdomen, 1st Trimester
- To take a faster volume acquisition time
→ Reduce and fit the **Volume Angle** to the structure.



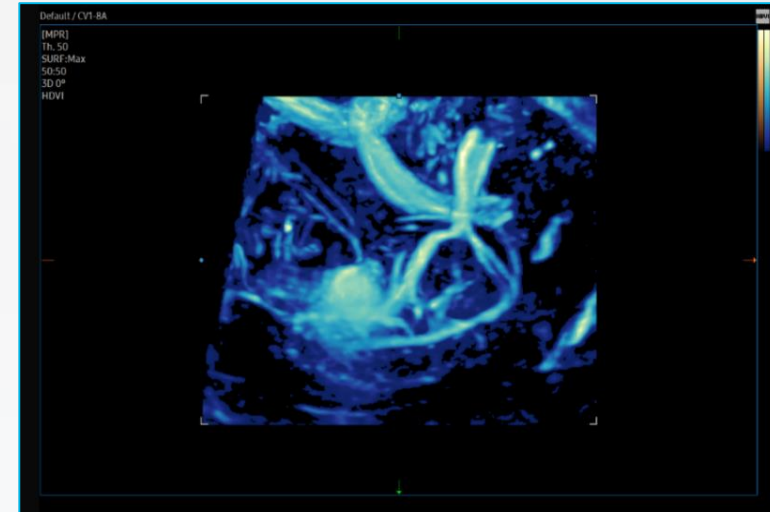
[MV-Flow 3D Ready Mode]

* You may reduce the scan Quality to save a acquisition time : Not usually recommended if you want to maintain a good SNR (Signal to Noise Ratio).

* 3D ROI Size is irrelevant with volume acquisition time.

03. On the MV-Flow™ 3D Mode

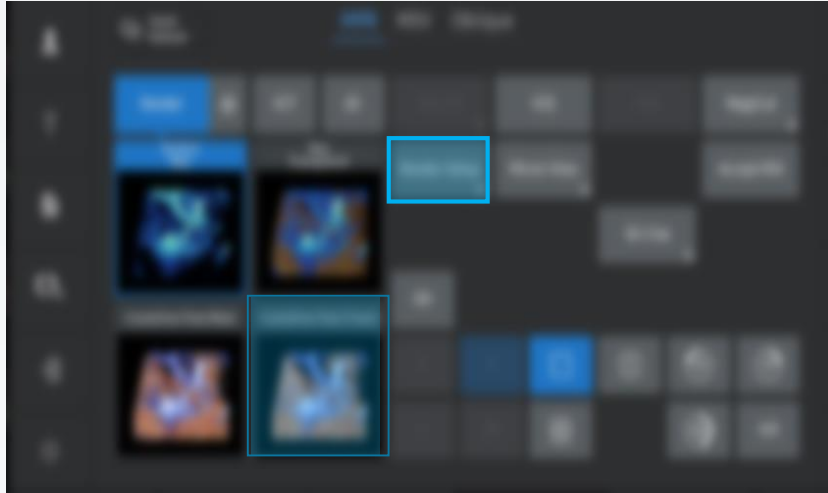
- **1. To have a dominant vascular visualization : Quick Change**
→ To emphasize a vascular structure visualization quickly, just tab the **Surface Max**.
→ To decrease the noise and make vessel sharper, increase the **Th.Low**'s index.



2. To have a dominant vascular visualization 2:

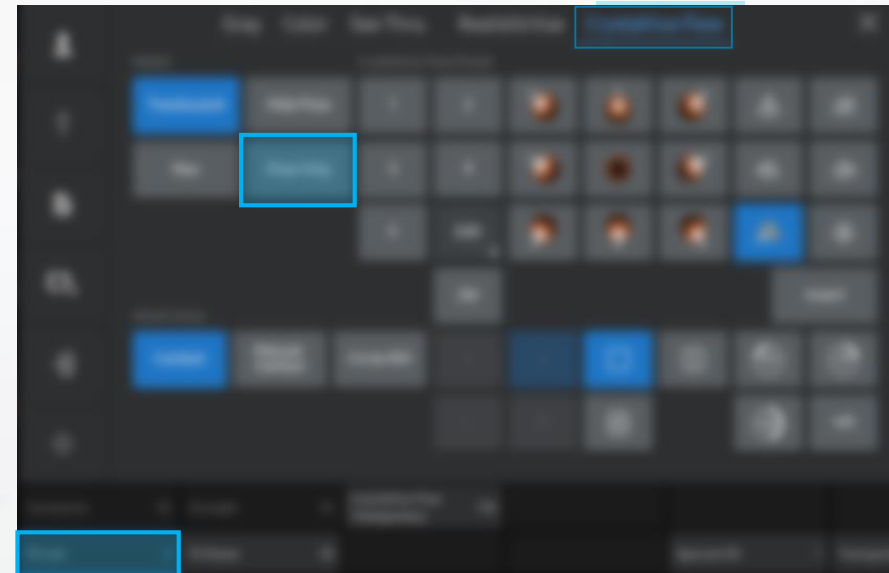
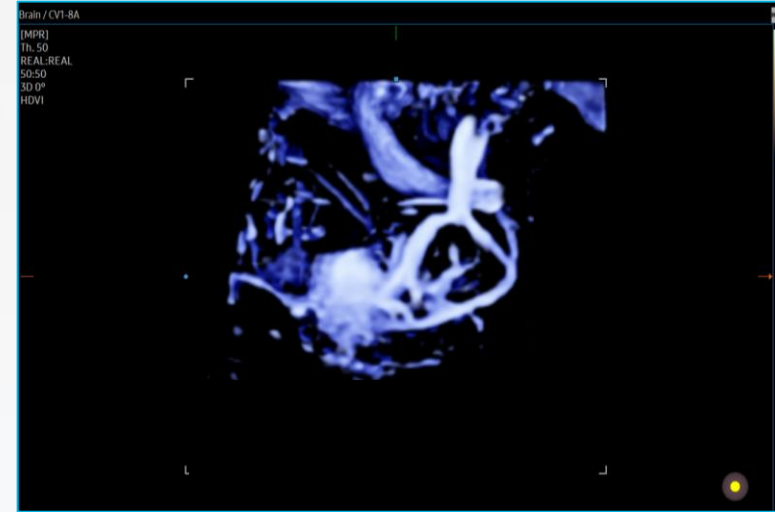
Go to the CrystalVue Flow(Trans) Mode

① Go to **RenderSetup** in CrystalVue Flow(Trans) Mode.



② Tap the **Flow Only** button.

- It will hide all the volume images except a vascular signal. Clean and well defined vessel will be demonstrated.
- Decrease the **Flow** to show more amount of vascularity.
- Increase the **Flow** to make vessels structure stronger.



04. Review a details : Ref. Slice

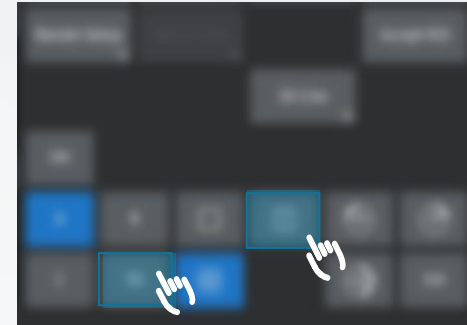
• Rendering manipulation to observe slice

• Change the layout to Dual from Quad to 2D view to display a Plane and 2D plane

by tapping the **2D** button.

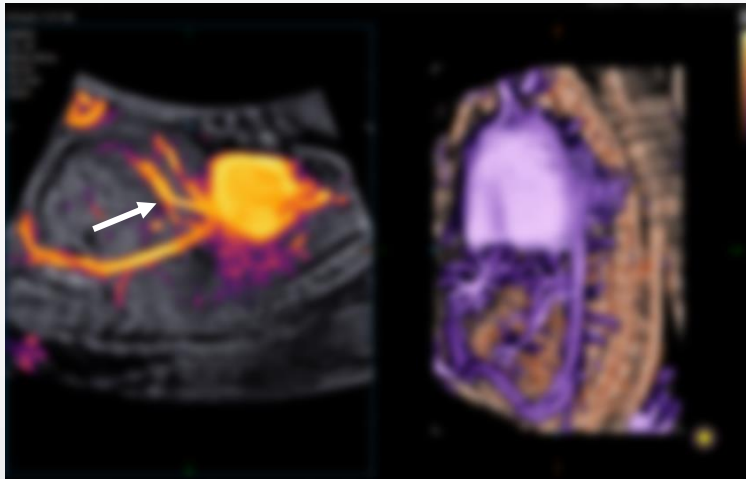
• Set your reference slice as a **3D** sensitive way to understand how to your manipulation

is working tap the **3D** button.



• To overview a vascular structure of the flow 3D as well as a plane's information simultaneously, rotate the **Ref. Slice** button.

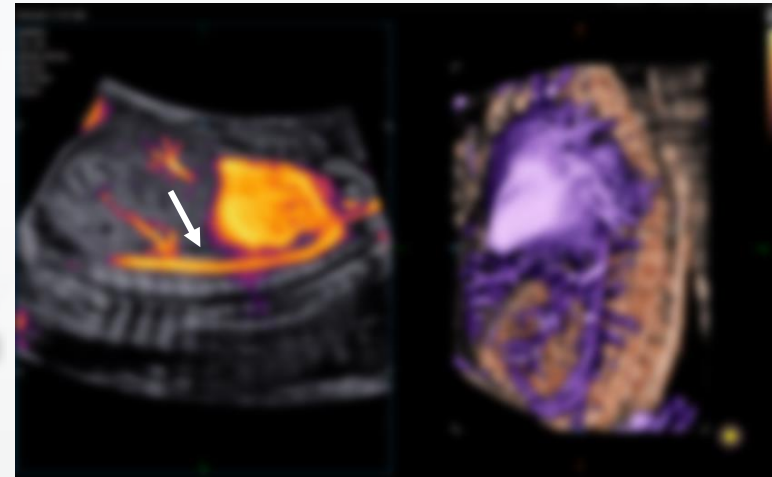
(Clock button on the Control Panel)



(Left view of the heart structure is shown)



(Change the Ref. Slice)

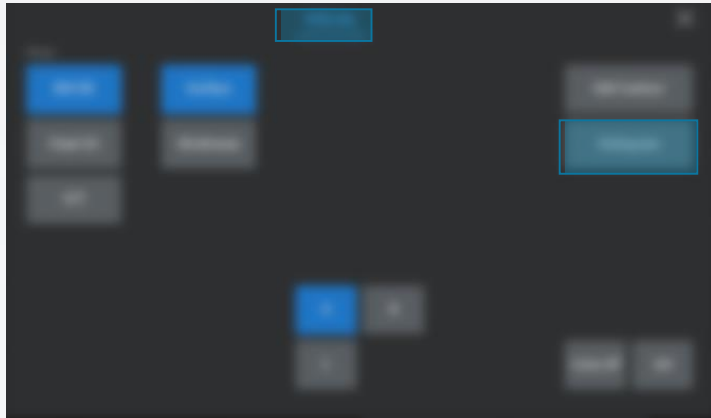


(Rotating surface shown on the 3D view)

05. Histogram : Vascularity Index through the VOCAL

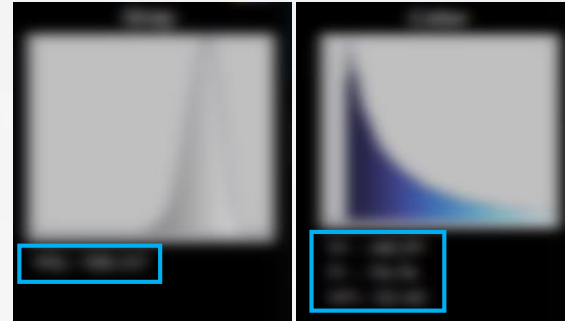
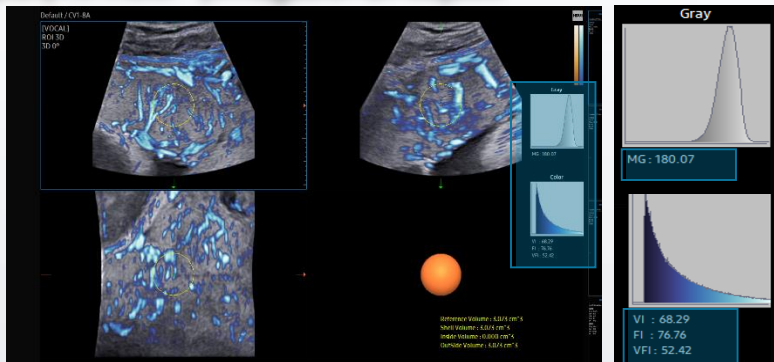
① Tab the **Histogram** in the *VOCAL Mode, then a shell histogram is calculated and displayed on the screen.

(*Whole VOCAL Procedure: Please refer to the Q-Manual)



② Result Definition

MG represents the gray value distribution within the 3D and Flow represents flow through the images of an object.



MG (Mean Gray Value)	The average value of gray value (brightness/gray) $MG = \frac{\text{the sum of brightness/gray}}{\text{the total number of voxels}}$
FI (Flow Index in Flow Index)	The ratio of color voxels to all voxels within the shell $FI = \frac{\text{number of color voxels}}{\text{total number of voxels}}$
VI (Flow Index)	The average value of brightness/velocity for color voxels within the shell $VI = \frac{\text{the sum of brightness/velocity}}{\text{total number of color voxels}}$
VFI (Vascular Flow Index in Flow Index)	The average value of brightness/velocity for all voxels within the shell $VFI = \frac{\text{the sum of brightness/velocity}}{\text{total number of voxels}}$

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