09. SUPPLEMENTAL MATERIAL
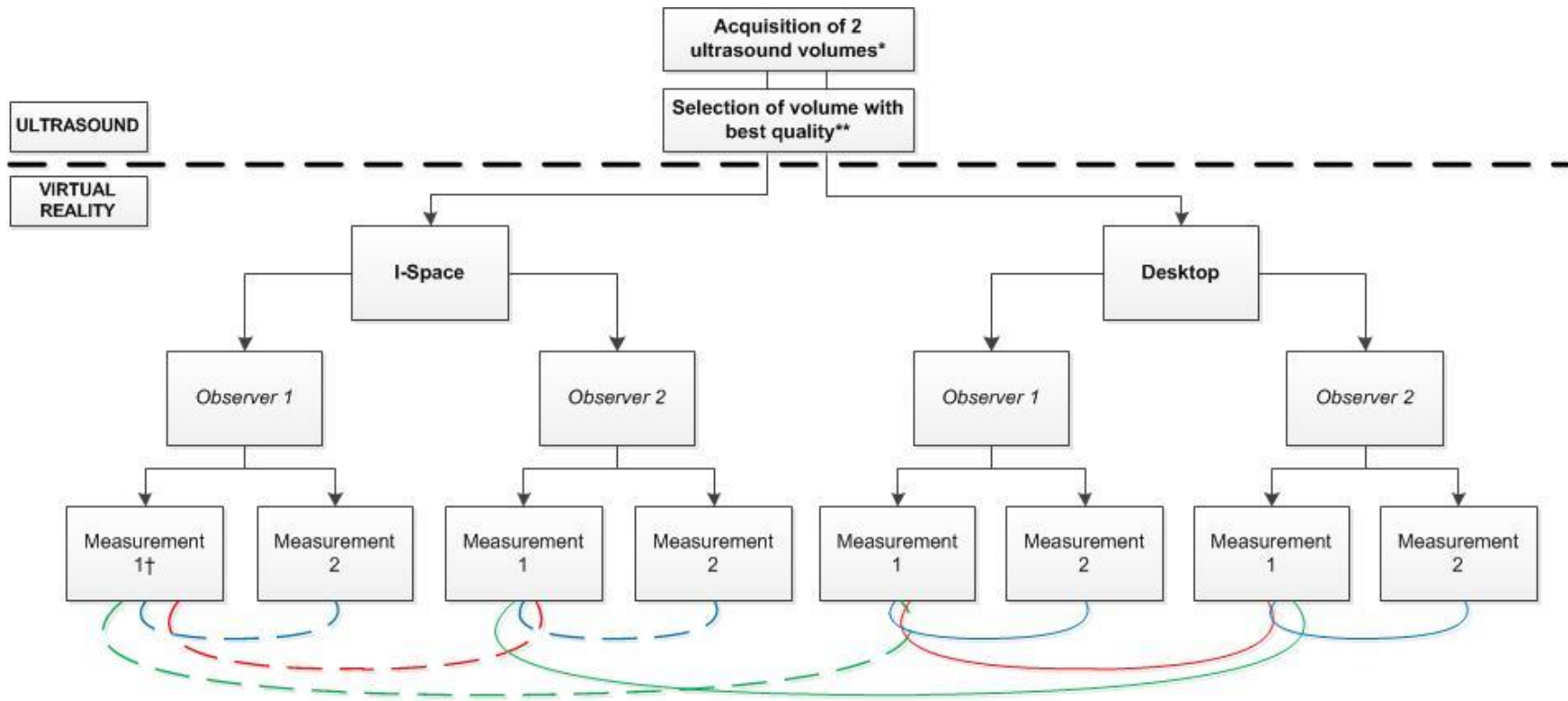
Supplemental Table 1. Measurements and intra- and inter-observer reliability parameters of utero-placental vascular volumes using the Virtual Reality Desktop system

		Median [range] (cm^3)		Intra-observer variability						Inter-observer variability					
				ICC	Mean difference (cm^3) [+ 95% CI]		Relative mean difference (%) [+ 95% CI]		ICC	Mean difference (cm^3) [+ 95% CI]		Relative mean difference (%) [+ 95% CI]	
Preconception *(n=5)*	**UVV**	1.66	[0.93;5.26]	0.99	0.22	[-0.01;0.84]	4.3	[8.0;14.2]	0.92	-0.40	[-0.70;0.10]	-18.5	[-35.6;-1.4]
Pregnancy													
7 weeks GA	**PVV**	0.40	[0.08;0.99]	0.99	0.01	[-0.02;0.04]	2.7	[-3.5;8.9]	0.87	-0.03	[-0.13;0.06]	21.5	[-7.4;50.4]
(n=10)	EVV	0.03	[0.01;0.17]	0.99	0.00	[0.00;0.01]	3.5	[-5.0;12.0]	0.63	-0.03	[-0.07;0.01]	-36.7	[-86.9;13.4]
9 weeks GA	**PVV**	4.83	[1.81;9.03]	0.96	-0.23	[-0.67;0.21]	-3.3	[-11.8;5.3]	0.86	0.02	[-0.56;0.60]	-0.6	[-16.1;15.0]
(n=10)	**EVV**	0.46	[0.25;0.82]	0.95	0.00	[-0.04;0.04]	-0.1	[-9.9;9.6]	0.96	0.00	[-0.04;0.03]	-2.4	[-9.6;4.8]
11 weeks GA	**PVV**	8.04	[2.07;20.58]	0.97	0.27	[-0.33;0.86]	3.7	[-7.9;15.3]	0.79	1.29	[-0.29;2.86]	21.4	[-7.8;50.5]
(n=10)	**EVV**	1.45	[0.57;2.16]	0.99	-0.03	[-0.08;0.02]	-1.6	[-4.9;1.8]	0.95	0.05	[-0.06;0.15]	3.8	[-3.6;11.3]

ICC = intraclass correlation coefficients; CI = confidence interval; GA = gestational age; UVV = uterine vascular volume; PVV = placental vascular volume; EVV = embryonic vascular volume.

8 **Supplemental Figure 1. Flowchart acquisition of ultrasound volumes and Virtual Reality measurements**

9

10 – – – A. Intra-observer agreement (for observer 1 and 2 seperately) using the I-space

11 – – – B. Inter-observer agreement (between observer 1 and 2) using the I-space

12 – – – C. Inter-system agreement (I-space vs. VR desktop) of observer 1, measurement 1

13 ——— D. Intra-observer agreement (for observer 1 and 2 seperately) using the VR desktop

14   ━━━━ E. Inter-observer agreement (between observer 1 and 2) using the VR desktop

15   ━━━━ F. Inter-system agreement (I-space vs. VR desktop) of observer 2, measurement 1

16   * Ultrasound performed preconceptional or in pregnancy (at either 7, 9 or 11 weeks gestational age), acquisition of 2 volumes per

17   patient: first volume in a midsagittal plane, second volume 90 degrees perpendicular to the first plane.
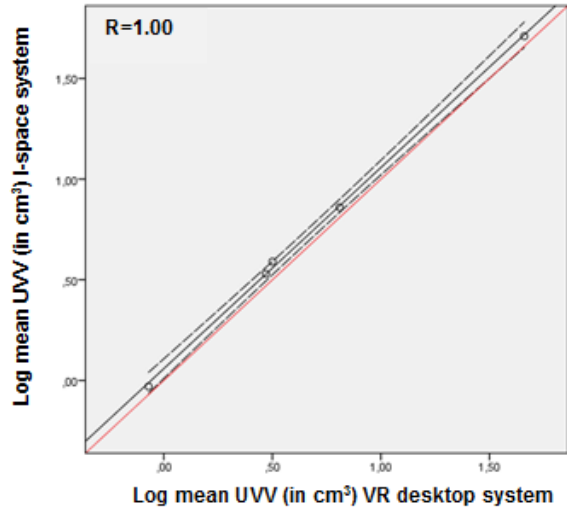
18   ** Items scored for assessment of volume quality: presence of artifacts due to maternal/fetal movements (yes/no), presence of

19   shadows (yes/no), volume completeness (yes/no), placental location in relation to transducer (close/far).

20   † Measurement of utero-placental vascular volumes: preconceptional uterine vascular volume (UVV, in cm^3); in pregnancy placental

21   vascular volume (PVV, in cm^3) and embryonic vascular volume (EVV, in cm^3).
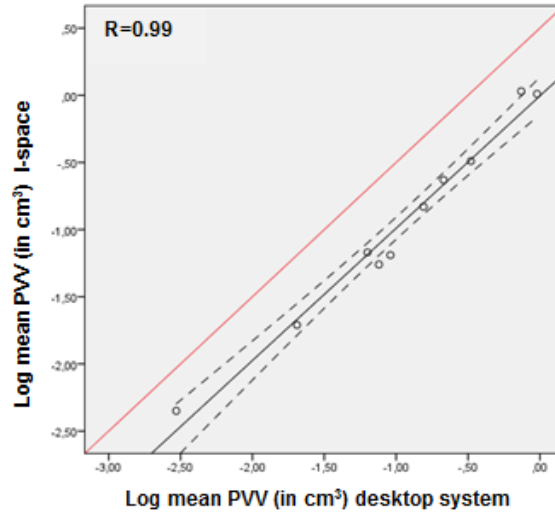
22

23   **Supplemental Figure 2. Correlation between utero-placental vascular volumes in two VR systems**
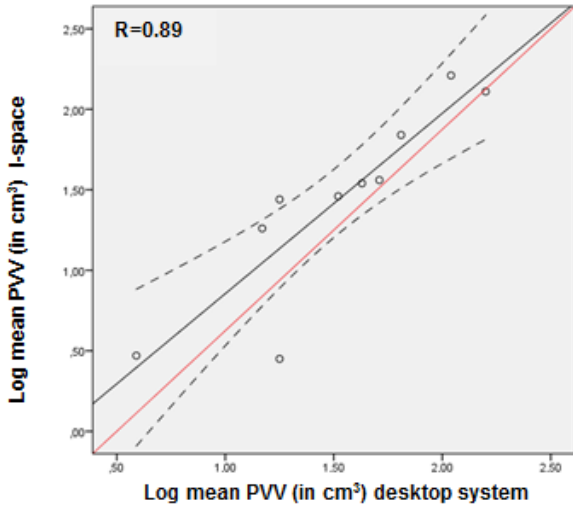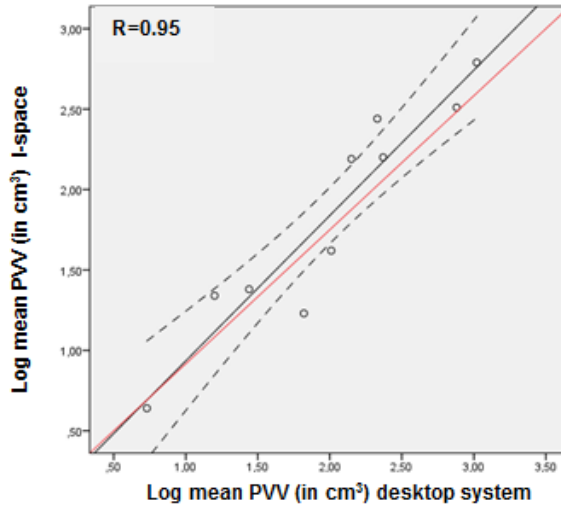

a. Preconception: UVV

b. Pregnancy (7 weeks GA): PVV

c. Pregnancy (9 weeks GA): PVV

d. Pregnancy (11 weeks GA) PVV

24

25   UVV = uterine vascular volume; PVV = placental vascular volume

26   Log = natural log transformation of UVV and PVV to achieve a normal distribution

27   R = Pearson's correlation coefficient

28   ——————   Correlation line

29   - - - - - - - - -   95% confidence interval for correlation

30   ——————   Reference line (optimal correlation)

31

32   **Supplemental Video 1. Utero-placental vascular volume at 12+3 weeks GA visualized in VR.**