Supplementary

Table S1 Typical four-dimensional flow acquisition parameters

Parameters	Conventional low VENC	Conventional high VENC	CS-accelerated dual VENC
Acquired spatial resolution, mm^3	1.50–1.76 × 1.50 × 1.50–1.76	Consistent in one participant	Consistent in one participant
FOV, mm^3	112 × 144 × 54–90	Consistent in one participant	Consistent in one participant
Phase-encoding direction	RL	Consistent in one participant	Consistent in one participant
Phase oversampling, %	15–40	Consistent in one participant	Consistent in one participant
Reconstructed spatial resolution, mm^3	1.50×1.50×1.50	Consistent in one participant	Consistent in one participant
Bandwidth, Hz/Px	498	498	496
Acquired temporal resolution, ms	45.5	41.0	43.2
Reconstructed cardiac phases, n	25	25	25
Echo time, ms	3.13	2.57	3.61
Repetition time, ms	5.69	5.13	6.17
Flip angle, °	7	7	7
Acceleration factor	3.0[†]; partial Fourier: phase 7/8, slice 7/8	3.0[†]; partial Fourier: phase 7/8, slice 7/8	8.9[‡]
Gating	Retrospective pulse-gating	Retrospective pulse-gating	Retrospective pulse-gating
VENC, cm/s	50–70	120–160	50–70 (low)/120–160 (high)

[†], GRAPPA. [‡], CS. CS, compressed sensing; FOV, field of view; GRAPPA, generalized autocalibrating partial parallel acquisition; VENC, velocity encoding.

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Table S2 Quality control of 4D flow parameter assessment in conventional and CS-accelerated VENC 4D flow sequences

Parameters	ICC for test-retest reliability		ICC for intraobserver		ICC for interobserver	
	Velocity	WSS	Velocity	WSS	Velocity	WSS
Conventional high VENC						
AA	0.936**	0.943**	0.946**	0.970**	0.919**	0.958**
LCIA	0.919**	0.931**	0.984**	0.973**	0.979**	0.965**
LEIA	0.934**	0.940**	0.973**	0.947**	0.958**	0.947**
RCIA	0.832**	0.808*	0.955**	0.944**	0.955**	0.945**
REIA	0.879**	0.910**	0.968**	0.963**	0.953**	0.955**
CS-accelerated high VENC						
AA	0.894**	0.866**	0.953**	0.937**	0.933**	0.930**
LCIA	0.908**	0.858**	0.958**	0.934**	0.933**	0.913**
LEIA	0.952**	0.949**	0.985**	0.959**	0.977**	0.941**
RCIA	0.884**	0.895**	0.888**	0.978**	0.903**	0.982**
REIA	0.939**	0.930**	0.937**	0.937**	0.918**	0.945**
Conventional low VENC						
IVC	0.898**	0.878**	0.988**	0.993**	0.983**	0.987**
LCIV	0.944**	0.941**	0.984**	0.979**	0.979**	0.986**
RCIV	0.961**	0.952**	0.993**	0.990**	0.990**	0.990**
LEIV	0.929**	0.859**	0.976**	0.936**	0.968**	0.896**
REIV	0.941**	0.907**	0.981**	0.972**	0.971**	0.976**
CS-accelerated low-VENC						
IVC	0.973**	0.978**	0.946**	0.929**	0.932**	0.908**
LCIV	0.921**	0.914**	0.973**	0.982**	0.966**	0.979**
RCIV	0.981**	0.979**	0.988**	0.993**	0.982**	0.985**
LEIV	0.95**	0.939**	0.986**	0.972**	0.983**	0.962**
REIV	0.98**	0.979**	0.995**	0.984**	0.993**	0.980**

*, P value <0.01; **, P value <0.001. 4D, four-dimensional; AA, abdominal aorta; CS, compressed sensing; ICC, intraclass correlation coefficient; IVC, inferior vena cava; LCIA, left common iliac artery; LCIV, left common iliac vein; LEIA, left external iliac artery; LEIV, left external iliac vein; RCIA, right common iliac artery; RCIV, right common iliac vein; REIA, right external iliac artery; REIV, right external iliac vein; VENC, velocity encoding; WSS, wall shear stress.

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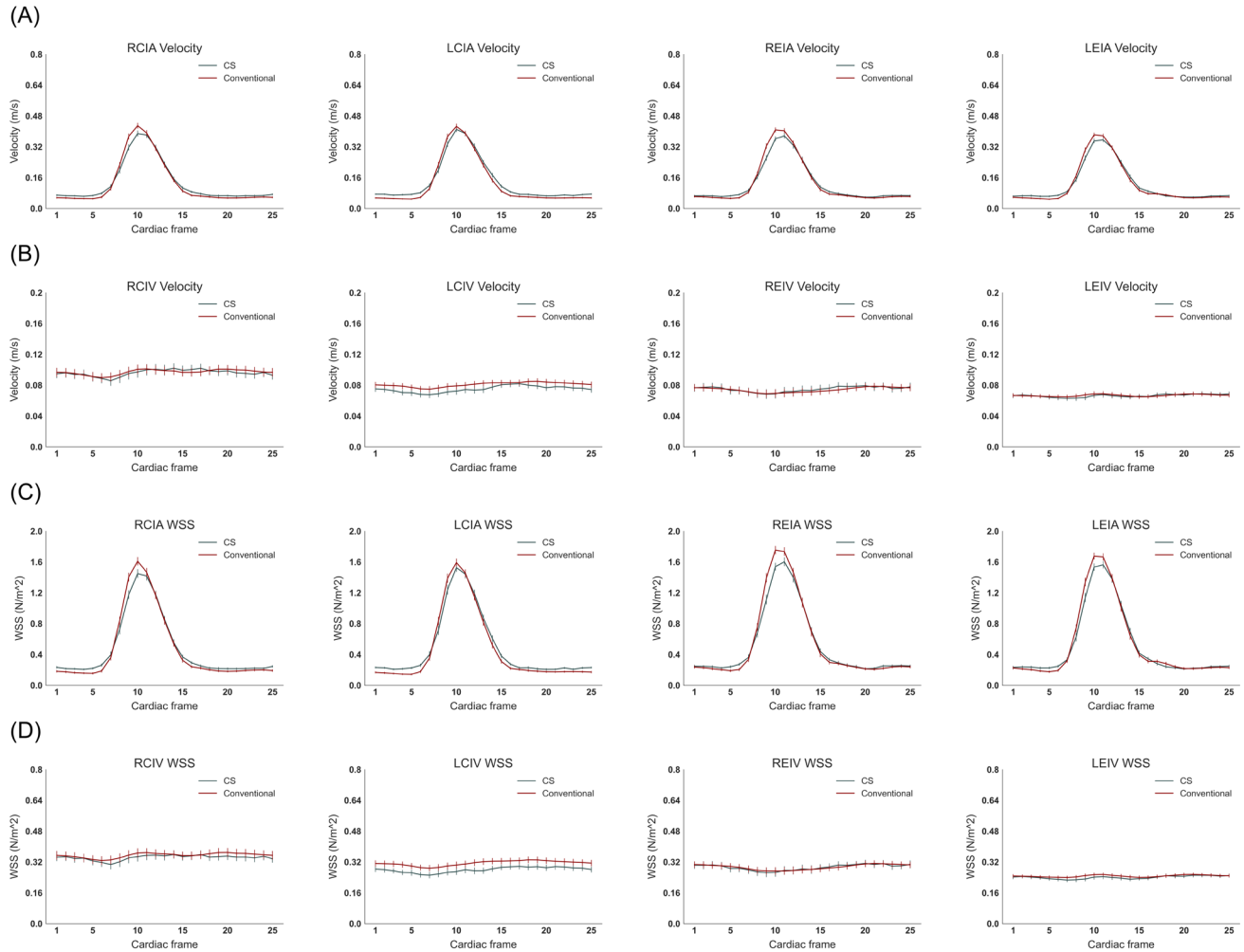

Figure S1 Comparison of velocity and WSS of different iliac arterial and venous segments in HCs. (A) Arterial segments velocity. (B) Arterial segments WSS. (C) Venous segments velocity. (D) Venous segments WSS. Red lines indicate parameters obtained with the conventional method, while green lines indicate parameters obtained with the CS-accelerated method. CS, compressed sensing; HCs: healthy controls; LCIA, left common iliac artery; LCIV, left common iliac vein; LEIA, left external iliac artery; LEIV, left external iliac vein; RCIA, right common iliac artery; RCIV, right common iliac vein; REIA, right external iliac artery; REIV, right external iliac vein; WSS, wall shear stress.

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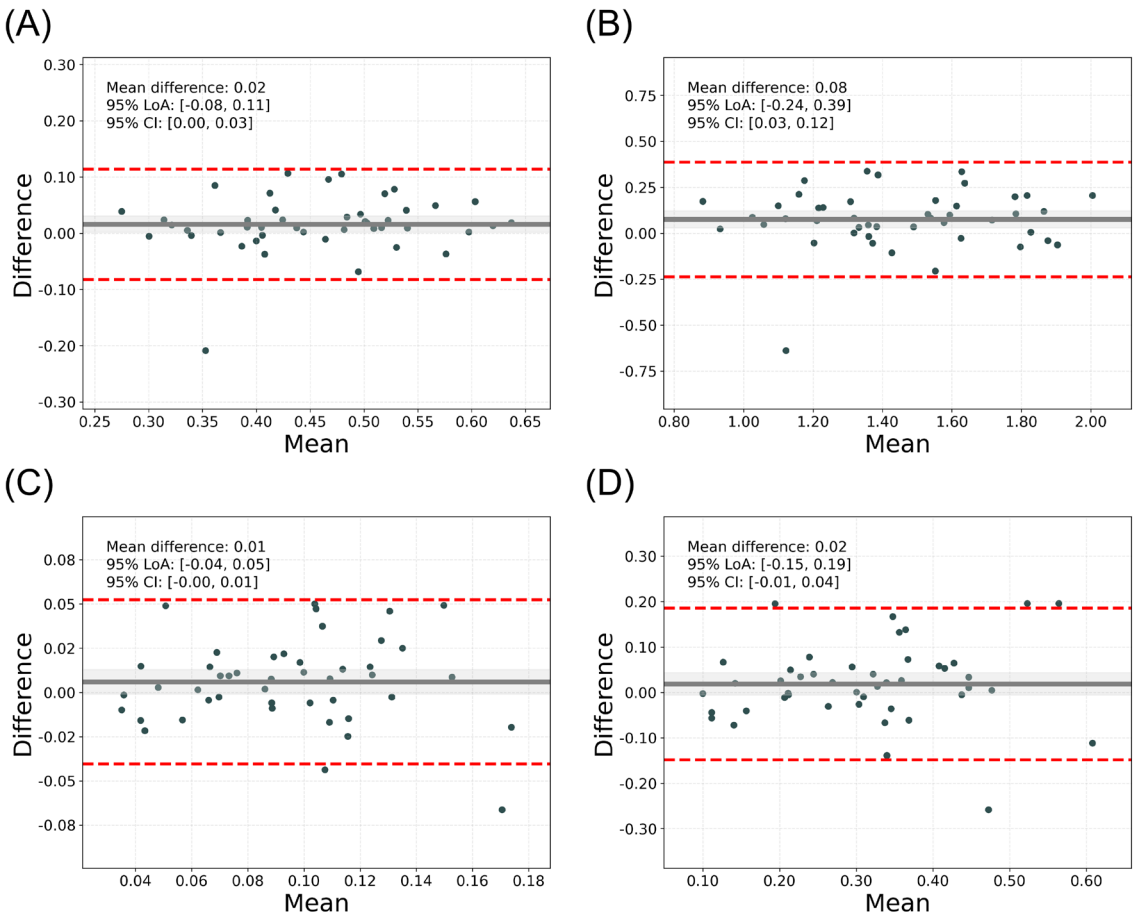

Figure S2 Bland-Altman plots for main flow parameters. (A) AA velocity. (B) AA WSS. (C) IVC velocity. (D) IVC WSS. AA, abdominal aorta; IVC, inferior vena cava; WSS, wall shear stress.

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