Supplemental Material

Table S1. Cardiac dimensions and volumes in 6½-year-old girls born extremely preterm (EXPT) or at term (CTRL).

	Girls EXPT* (n=69)	Girls CTRL* (n=52)	p-value	Adjusted† differences in means (95% CI)	p-value
LA dimensions					
LA_s length	33.8(5.1)	38.0(4.0)	<0.001	-0.5(-2.0;1.0)	0.54
LA_s width	27.0(3.2)	28.6(2.8)	0.006	-0.4(-1.5;0.8)	0.55
LA sphericity index	1.26(0.19)	1.34(0.17)	0.03	0.0007(-0.07;0.07)	0.98
LV dimensions					
LV_d length	54.7(4.1)	58.6(4.2)	<0.001	-1.9(-3.4;-0.4)	0.02
LV_d width	35.4(3.2)	36.0(2.7)	0.30	-0.3(-1.4;0.7)	0.59
LV sphericity index	1.55(0.16)	1.64(0.16)	0.004	-0.04(-0.11;0.02)	0.21
AoV annulus	13.7(1.0)	15.0(0.9)	<0.001	-0.6(-1.0;-0.3)	<0.001
Volumes					
SV, ml	15.3(2.2)	17.3(2.7)	<0.001	-1.4(-2.4;-0.3)	0.01
CO, l/min	1.36(0.22)	1.47(0.22)	0.02	-0.06(-0.2;0.04)	0.22
Wall thickness					
IVS_d	5.5(0.9)	5.9(0.9)	0.005	-0.2(-0.5;0.2)	0.35
PW_d	5.3(0.7)	5.5(0.7)	0.11	-0.1(-0.4;0.2)	0.44
Relative WT	0.31(0.04)	0.31(0.04)	0.88	0.0(-0.02;0.02)	1.00
LVM‡ g	46.4(8.6)	54.9(10.1)	<0.001	-3.7(-7.0;-0.4)	0.03

Data are mean (SD) and expressed in millimeters if not indicated otherwise. *Unadjusted values.

†Differences in means adjusted to body surface area (m^2) and site. ‡LVM calculated according to Devereux[1].

AoV annulus=Aorta valve annulus diameter, CO=cardiac output, IVS=interventricular septum, LA=left atrium, LV=left ventricle, LVM=left ventricular mass, PW=posterior wall, Sphericity index= length/width. SV=stroke volume, WT=wall thickness.

Table S2. Cardiac dimensions and volumes in 6½-year-old boys born extremely preterm (EXPT) and at term (CTRL).

	Boys EXPT* (n=86)	Boys CTRL* (n=77)	p-value	Adjusted† differences in means (95% CI)	p-value
LA dimensions					
LA_s length	35.5(6.3)	40.2(5.0)	<0.001	-0.05(-1.7;1.6)	0.95
LA_s width	27.4(3.0)	30.0(3.5)	<0.001	-1.0(-2.1;0.2)	0.09
LA sphericity index	1.30(0.21)	1.35(0.21)	0.12	0.04(-0.03;0.1)	0.28
LV dimensions					
LV_d length	54.6(4.4)	58.7(3.8)	<0.001	-1.7(-3.0;-0.4)	0.008
LV_d width	35.6(3.3)	38.1(3.4)	<0.001	-1.6(-2.6;-0.5)	0.003
LV sphericity index	1.54(0.17)	1.55(0.14)	0.66	0.02(-0.04;0.07)	0.56
AoV annulus	14.1(1.1)	15.8(1.0)	<0.001	-1.0(-1.3;-0.06)	<0.001
Volumes					
SV, ml	16.1(3.0)	17.8(3.1)	0.0008	-0.3(-1.4;0.7)	0.53
CO, l/min	1.38(0.26)	1.47(0.24)	0.03	-0.009(-1.0;0.08)	0.85
Wall thickness					
IVS_d	5.6(0.9)	6.2(0.7)	<0.001	-0.04(-0.3;0.2)	0.69
PW_d	5.5(0.8)	5.7(0.7)	0.02	0.2(-0.05;0.4)	0.13
Relative WT	0.31(0.04)	0.31(0.04)	0.78	0.02(0.004;0.03)	0.014
LVM‡ g	50.1(12.8)	62.3(10.8)	<0.001	-2.6(-5.8;0.6)	0.11

Data are mean (SD) and expressed in millimeters if not indicated otherwise.

*Unadjusted values.

†Mean difference adjusted to body surface area (m^2) and site.

‡LVM calculated according to Devereux[1]

AoV annulus=Aorta valve annulus diameter, CO=cardiac output, IVS=interventricular septum, LA=left atrium, LV=left ventricle, LVM=left ventricular mass, PW=posterior wall, Sphericity index=length/width. SV=stroke volume, WT=wall thickness.

Table S3. Cardiac dimensions and volumes in 6½-year-old children born extremely preterm stratified by gestational age in weeks.

	GA 22-24 wks* (n=40)	GA 25-26 wks* (n=105)	p-value	Adjusted† differences in means (95% CI)	p-value
LA dimensions					
LA_s length	32.8(5.1)	35.3(5.8)	0.017	0.6(-0.9;2.1)	0.40
LA_s width	26.1(2.5)	27.6(3.2)	0.007	0.7(-0.3;1.8)	0.17
LA sphericity index	1.26(0.18)	1.29(0.21)	0.52	-0.007(-0.07;0.06)	0.82
LV dimensions					
LV_d length	53.9(4.1)	54.9(4.4)	0.22	-0.3(-1.7;1.01)	0.63
LV_d width	34.8(3.3)	35.8(3.2)	0.09	0.5(-0.4;1.5)	0.28
LV sphericity index	1.56(0.16)	1.54(0.18)	0.58	-0.03(-0.09;0.02)	0.27
AoV annulus	13.5(1.1)	14.0(1.0)	0.003	0.3(0.005;0.60)	0.05
Volumes					
SV, ml	14.6(2.3)	16.1(2.4)	0.001	1.2(0.3;2.1)	0.01
CO, l/min	1.28(0.28)	1.40(0.22)	0.009	0.1(0.008;0.02)	0.03
Wall thickness					
IVS_d	5.4(1.0)	5.6(0.8)	0.27	-0.08(-0.4;0.2)	0.59
PW_d	5.3(0.7)	5.4(0.8)	0.88	-0.2(-0.4;0.08)	0.18
Relative WT	0.32(0.05)	0.30(0.04)	0.14	-0.02(-0.03;-0.002)	0.03
LVM‡, g	43.9(7.7)	49.9(11.9)	0.003	1.1(-2.0;4.2)	0.48

Data are mean (SD) and expressed in millimeters if not indicated otherwise.

*Unadjusted values.

†Mean difference adjusted to body surface area (m^2) and site.

‡LVM calculated according to Devereux[1]

AoV annulus=Aorta valve annulus diameter, CO=cardiac output, IVS=interventricular septum, LA=left atrium, LV=left ventricle, LVM=left ventricular mass, PW=posterior wall, Sphericity index=length/width. SV=stroke volume, WT=wall thickness.

Table S4. Left heart systolic and diastolic function in 6½-year-old children born extremely preterm stratified by gestational age in weeks.

	GW22-24* (n=41)	GW 25-26* (n=109)	p-value	Adjusted† differences in means (95% CI)	p-value
Systolic function					
MAPSE, mm	11.7(1.9)	12.8(1.8)	0.002	1.1(0.4;1.7)	0.002
Shortening fraction	0.37(0.05)	0.36(0.04)	0.75	-0.001(-0.02;0.02)	0.88
Septal					
TDI s', cm/s	6.4(0.8)	6.8(1.1)	0.04	0.4(0.08;0.8)	0.02
MPI'	0.44(0.08)	0.44(0.07)	0.55	0.009(-0.02;0.04)	0.56
Lateral					
TDI s', cm/s	8.0(1.8)	8.4(1.3)	0.15	0.4(-0.1;1.0)	0.12
MPI'	0.45(0.07)	0.42(0.06)	0.07	-0.02(-0.05;0.003)	0.08
Diastolic function					
MV E, cm/s	90.2(13.2)	91.0(13.0)	0.76	1.0(-3.4;5.5)	0.64
MV A, cm/s	46.0(11.2)	47.8(10.9)	0.34	2.0(-1.9;5.9)	0.31
Septal					
Mitral e', cm/s	12.5(1.4)	12.4(1.5)	0.69	-0.09(-0.6;0.4)	0.75
Mitral a', cm/s	4.6(1.7)	4.6(1.2)	0.81	0.09(-0.4;0.6)	0.72
E/e'	7.3(1.3)	7.5(1.2)	0.33	0.2(-0.3;0.7)	0.37
ivct, ms	60(13)	60(12)	0.91	-0.04(-5.0;4.3)	0.88
ivrt, ms	56(9)	58(10)	0.38	1.9(-1.7;5.5)	0.30
Lateral					
Mitral e', cm/s	16.2(2.7)	16.7(2.2)	0.35	0.5(-0.4;1.4)	0.30
Mitral a', cm/s	5.2(1.4)	5.3(1.4)	0.71	0.2(-0.3;0.6)	0.49
E/e'	5.8(1.5)	5.6(1.1)	0.58	-0.1(-0.6;0.4)	0.58
ivct , ms	64(14)	60(11)	0.09	-4.1(-8.9;0.7)	0.09
ivrt , ms	56(10)	57(11)	0.71	1.1(-3.1;5.3)	0.61

*Unadjusted mean (SD) values.

[†]Mean difference adjusted for site.

E/e'= transmitral early diastolic velocity indexed to mitral annular early diastolic velocity,

ivct= mitral annular isovolumic contraction time, ivrt= mitral annular isovolumic relaxation time,

MAPSE= Mitral annular plane systolic excursion, Mitral valve E=transmitral valve early diastolic velocity, Mitral e'= mitral annular early diastolic velocity, Mitral a'= mitral annular late diastolic velocity, TDI=Tissue Doppler Imaging, TDI s'=mitral annular systolic ejection velocity in, MPI'= TDI derived myocardial performance index.

Table S5. Cardiac dimensions and volumes in 6½-year-old children born extremely preterm stratified by small for gestational age (SGA) or appropriate for gestational age (AGA) at birth.

	SGA* (n=22)	AGA* (n=123)	p-value	Adjusted† differences in means (95% CI)	p-value
LA dimensions					
LA_s length	31.8(4.6)	35.1(5.7)	0.010	-0.6(-2.5;1.3)	0.52
LA_s width	25.7(3.2)	27.4(3.0)	0.016	-0.7(-2.07;0.6)	0.27
LA sphericity index	1.25(0.19)	1.29(0.20)	0.40	0.02(-0.07;0.10)	0.69
LV dimensions					
LV_d length	52.5(4.3)	54.9(4.2)	0.015	-1.4(-3.1;0.3)	0.10
LV_d width	35.7(3.2)	35.5(3.2)	0.81	0.07(-1.2;1.3)	0.91
LV sphericity index	1.48(0.18)	1.56(0.17)	0.06	-0.04(-0.1;0.03)	0.24
AoV annulus	13.5(1.05)	13.9(1.07)	0.10	0.009(-0.03;0.05)	0.62
Volumes					
SV, ml	15.5(2.2)	15.6(2.5)	0.81	0.2(-1.0;1.46)	0.68
CO, l/min	1.40(0.22)	1.36(0.24)	0.60	0.06(-0.06;0.2)	0.34
Wall thickness					
IVS_d	5.4(1.0)	5.6(0.9)	0.41	0.05(-0.3;0.4)	0.78
PW_d	5.2(0.8)	5.4(0.8)	0.20	-0.06(-0.4;0.2)	0.69
Relative WT	0.30(0.04)	0.31(0.04)	0.69	-0.0004(-0.02;0.02)	0.97
LVM‡ g	44.9(13.4)	48.8(10.6)	0.12	0.3(-3.4;3.9)	0.89

Data are mean (SD) and expressed in millimeters if not indicated otherwise.

*Unadjusted values.

† Difference in means adjusted to body surface area (m^2) and site.

‡LVM calculated according to Devereux[1]

AoV annulus=Aorta valve annulus diameter, CO=cardiac output, IVS=interventricular septum, LA=left atrium, LV=left ventricle, LVM=left ventricular mass, PW=posterior wall, Sphericity index=length/width. SV=stroke volume, WT=wall thickness.

Table S6. Left heart systolic and diastolic function in 6½-year-old children born extremely preterm stratified by small for gestational age (SGA) and appropriate for gestational age (AGA) at birth.

	SGA* (n=26)	AGA* (n=139)	p-value	Adjusted† differences in means (95% CI)	p-value
Systolic function					
MAPSE, mm	12.2(2.2)	12.5(1.8)	0.42	-0.4(-1.2;0.5)	0.37
Shortening fraction	0.37(0.04)	0.36(0.05)	0.41	0.005(-0.02;0.02)	0.63
Septal					
TDI s', cm/s	6.4(0.8)	6.7(1.0)	0.31	-0.5(-1.0;0.001)	0.05
MPI'	0.46(0.06)	0.44(0.07)	0.29	0.02(-0.02;0.06)	0.26
Lateral					
TDI s', cm/s	8.3(1.4)	8.3(1.5)	0.96	-0.2(-0.9;0.5)	0.60
MPI'	0.46(0.06)	0.42(0.06)	0.05	0.03(-0.004;0.06)	0.08
Diastolic function					
MV E, cm/s	95.5(16.0)	89.9(12.3)	0.06	4.4(-1.3;10.1)	0.13
MV A, cm/s	47.6(10.5)	47.2(11.1)	0.89	-0.1(-5.2;4.9)	0.96
Septal					
Mitral e', cm/s	12.3(1.3)	12.4(1.5)	0.73	-0.3(-1.0;0.4)	0.40
Mitral a', cm/s	4.4(1.0)	4.6(1.4)	0.56	-0.4(-1.0;0.2)	0.23
E/e'	8.0(1.7)	7.3(1.2)	0.038	0.6(-0.02;1.2)	0.06
ivct , ms	63(12)	59(12)	0.23	4.5(-1.6;10.6)	0.15
ivrt , ms	60(7)	57(10)	0.22	1.6(-3.1;6.4)	0.50
Lateral					
Mitral e', cm/s	17.0(2.4)	16.5(2.4)	0.41	0.2(-0.9;1.4)	0.69
Mitral a', cm/s	5.8(1.8)	5.1(1.3)	0.06	0.2(-0.4;0.8)	0.46
E/e'	5.9(1.7)	5.6(1.1)	0.35	0.3(-0.4;0.9)	0.38
ivct , ms	65(11)	60(12)	0.17	4.8(-1.4;11.1)	0.13
ivrt , ms	59(13)	56(11)	0.26	1.4(-4.1;6.9)	0.62

*Unadjusted values.

[†] Differences in means adjusted for site.

E/e'= transmitral early diastolic velocity indexed to mitral annular early diastolic velocity, ivct= mitral annular isovolumic contraction time, ivrt= mitral annular isovolumic relaxation time, MAPSE= Mitral annular plane systolic excursion, Mitral valve E=transmitral valve early diastolic velocity, Mitral e'= mitral annular early diastolic velocity, Mitral a'= mitral annular late diastolic velocity, TDI=Tissue Doppler Imaging, TDI s'=mitral annular systolic ejection velocity in, MPI'= TDI derived myocardial performance index.

Table S7. Cardiac dimensions and volumes in 6½-year-old children born extremely preterm (EXPT) stratified by presence of hemodynamically significant PDA in the neonatal period.

	PDA* (n=90)	No PDA* (n=58)	p-value	Adjusted† differences in means (95% CI)	p-value
LA dimensions					
LA_s length	34.7(5.8)	34.7(5.8)	0.98	1.0(-0.4;2.4)	0.16
LA_s width	27.0(3.1)	27.6(3.2)	0.21	-0.4(-1.4;0.6)	0.41
LA sphericity index	1.29(0.2)	1.26(0.2)	0.33	0.06(-0.003;0.1)	0.06
LV dimensions					
LV_d length	54.2(4.1)	55.2(4.6)	0.18	0.02(-1.3;1.3)	0.98
LV_d width	35.4(3.1)	35.8(3.4)	0.42	-0.01(-0.9;0.9)	0.98
LV sphericity index	1.54(0.2)	1.55(0.2)	0.62	-0.002(-0.06;0.06)	0.95
AoV annulus	13.8(1.0)	14.0(1.1)	0.20	0.05(-0.2;0.3)	0.72
Volumes					
SV, ml	15.5(2.8)	16.1(2.1)	0.18	-0.06(-1.0;0.8)	0.89
CO, l/min	1.38(0.3)	1.35(0.2)	0.50	0.07(-0.2;0.2)	0.13
Wall thickness					
IVS_d	5.5(0.9)	5.6(0.9)	0.22	-0.01(-0.3;0.3)	0.94
PW_d	5.3(0.8)	5.5(0.7)	0.17	-0.2(-0.4;0.1)	0.24
Relative WT	0.31(0.05)	0.31(0.04)	0.90	0.006(-0.009;0.02)	0.43
LVM‡, g	46.3(9.3)	51.4(13.1)	0.006	-2.8(-5.7;-0.03)	0.05

Data are mean (SD) and expressed in millimeters if not indicated otherwise.

*Unadjusted values.

† Differences in means adjusted to body surface area (m^2) , gestational age in weeks, and site.

‡LVM calculated according to Devereux[1]

AoV annulus=Aorta valve annulus diameter, CO=cardiac output, IVS=interventricular septum, LA=left atrium, LV=left ventricle, LVM=left ventricular mass, PW=posterior wall, Sphericity index=length/width. SV=stroke volume, WT=wall thickness.

Table S8. Left heart systolic and diastolic function in 6½-year-old children born extremely preterm stratified by stratified by presence of hemodynamically significant PDA.

	PDA* (n=91)	PDA* (n=59)	p-value	Adjusted† differences in means (95% CI)	p-value
Systolic function					
MAPSE, mm	12.3(1.9)	12.8(1.8)	0.14	-0.3(-0.9;0.4)	0.40
Shortening fraction	0.36(0.04)	0.37(0.04)	0.09	-0.01(-0.03;0.0008)	0.06
Septal					
TDI s', cm/s	6.7(1.1)	6.6(0.8)	0.36	0.3(-0.05;0.6)	0.09
MPI'	0.43(0.06)	0.44(0.07)	0.40	-0.01(-0.03;0.01)	0.40
Lateral					
TDI s', cm/s	8.3(1.5)	8.2(1.3)	0.71	0.2(-0.4;0.7)	0.49
MPI'	0.45(0.07)	0.44(0.06)	0.42	0.01(-0.04;0.01)	0.31
Diastolic function					
MV E, cm/s	89.3(12.5)	93.1(13.5)	0.08	-4.6(-9.0;-0.3)	0.04
MV A, cm/s	47.5(10.4)	47.0(12.1)	0.78	0.5(-3.4;4.3)	0.81
Septal					
Mitral e', cm/s	12.3(1.4)	12.6(1.4)	0.14	-0.4(-0.9;0.1)	0.13
Mitral a', cm/s	4.6(1.2)	4.5(1.6)	0.80	0.1(-0.4;0.6)	0.61
E/e'	7.4(1.2)	7.5(1.4)	0.51	-0.1(-0.6;0.3)	0.56
ivct, ms	60(14)	59(10)	0.51	1.3(-3.3;5.9)	0.58
ivrt, ms	56(10)	58(10)	0.29	-1.5(-5.0;2.0)	0.40
Lateral					
Mitral e', cm/s	16.3(2.3)	16.9(2.5)	0.19	-0.6(-1.4;0.3)	0.20
Mitral a', cm/s	5.3(1.5)	5.1(1.3)	0.52	0.2(-0.2;0.7)	0.26
E/e'	5.6(1.2)	5.7(1.4)	0.66	-0.1(-0.6;0.4)	0.68
ivct, ms	60(12)	62(12)	0.34	-3.2(-7.9;1.4)	0.17
ivrt, ms	55(11)	59(11)	0.07	-3.3(-7.3;0.7)	0.10

*Unadjusted values.

[†] Differences in means adjusted for gestation age in weeks & site.

E/e'= transmitral early diastolic velocity indexed to mitral annular early diastolic velocity, ivct= mitral annular isovolumic contraction time, ivrt= mitral annular isovolumic relaxation time, MAPSE= Mitral annular plane systolic excursion, Mitral valve E=transmitral valve early diastolic velocity, Mitral e'= mitral annular early diastolic velocity, Mitral a'= mitral annular late diastolic velocity, TDI=Tissue Doppler Imaging, TDI s'=mitral annular systolic ejection velocity in, MPI'= TDI derived myocardial performance index.

Supplemental Reference:

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