

# Paediatric haemodynamic parameters

## Mostcare Up

This quick reference guide details the normal physiological ranges of various haemodynamic parameters for different age groups.

### Circulation Blood Volume and Stroke Volume by age

Age group	Circulating Blood Volume (CBV) mL/kg	Stroke Volume (SV) mL/beat
Neonate	85 - 90	5
Infant	75 - 80	5 - 13
Child	70 - 75	13 - 50
Adolescent	60 - 70	50 - 85
Adult	60 - 65	60 - 130

### Organs in receipt of Cardiac Output by percentage

Tissue	Directed Blood-Flow of Cardiac Output in Infants (%)	Directed Blood-Flow of Cardiac Output in Adults (%)
Brain	34	14.3
Coronary	3	4.3
Splanchnic	25	28.6
Renal	18	25.7
Muscle	10	11.4
Fat	5	10
Poorly perfused tissue	5	10

### Systemic Vascular Resistance by age

Age group	Systemic Vascular Resistance (SVR) dynes/sec/cm <sup>5</sup>
Infant	2800 - 4000
Child	1200 - 2800
Adult	800 - 1200

## Normal heart rate range by age

Age group	Heart rate range (SVR) beats/min
Infant	100 - 180
Child	70 - 110
Adult	60 - 100

## Cardiac Output by age

Age group	Cardiac Output (CO) L/min	Cardiac Index (CI) L/min/m <sup>2</sup>
Neonate and Infant	0.8 - 1.3	4.0 - 5.0
Child	1.3 - 3.0	3.0 - 4.5
Adolescent and Adult	4.0 - 8.0	2.5 - 4.0

## Definitions and calculations

### Cardiac Output (CO):

- The volume of blood ejected from the heart in one minute
- Unit = litres/minute (L/min)
- Cardiac Output = Heart Rate × Stroke Volume (CO = HR × SV)

### Heart Rate (HR):

- Unit = beats/min

### Stroke Volume (SV):

- The volume of blood ejected from either ventricle per contraction of the heart i.e. in one beat
- Unit = mL/beat

### Cardiac Index (CI):

- Unit = L/min/m<sup>2</sup>
- Cardiac Index = Cardiac Output/Body Surface Area (CI = CO/BSA)

### Stroke Volume Index (SVI):

- Unit = mL/beat/m<sup>2</sup>
- Stroke Volume Index = Stroke Volume/Body Surface Area (SVI = SV/BSA)  
= 30-60mL/beat/m<sup>2</sup>



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