Monitor and Vital Signs

Vital sign targets and clinical goals

Age-related vital sign targets

Age	Heart Rate*	Respiratory Rate*	SBP**	MAP**	DBP**
Term NB	90-170	40-60	>60	>40	>30
0 to 30 days	110-180	30-50	>60	>40	>30
3 Mo	110-180	30-45	>65	>45	>30
6 Mo	110-180	25-35	>65	>45	>30
1 Yr	80-160	20-30	>70	>50	>35
2 Yrs	80-130	20-30	>75	>50	>40
4 Yrs	80-120	20-30	>75	>50	>40
6 Yrs	75-115	18-24	>85	>60	>45
8 Yrs	70-110	18-22	>85	>60	>45
10 Yrs	70-110	16-20	>85	>60	> 45
12 Yrs	60-110	16-20	>85	>60	> 45
14 Yrs to Adult	60-100	16-20	>90	>65	>50

*Heart rate and respiratory rate from Pediatric Early Warning Score (PEWS)

Systolic blood pressure, mean arterial pressure (MAP) and diastolic blood pressure (DBP) values from Children's Hospital of Philadelphia, Sepsis Critical Care Pathway—PICU (http://www.chop.edu/clinical-pathway/icu-clinical-pathway-infants-28-days-and-children-severe-sepsisseptic-shock-vital**)

RN Assessment and vital sign documentation

Parameters to Assess	Capillary refill Extremity temperature Pulse strength Mental status
Frequency	At time of pathway initiation Every 15 minutes for the 1st hour Every 30 minutes for the 2nd hour Hourly until goals met Discuss with the Resident, Nurse Practitioner, or Attending when to space out these assessments

Clinical goals for initial resuscitation

Parameter	Comment	Target
Heart Rate	Tachycardia can be a sign of hypovolemia or ongoing shock; Bradycardia can be a sign of shock	Age-related (see table above)
Systolic Blood Pressure (SBP)	Arterial monitoring preferred	Age-related (see table above)
Diastolic Blood Pressure (DBP)	Arterial monitoring preferred	Age-related (see table above)
Mean Arterial Blood Pressure (MAP)	Arterial monitoring preferred	Age-related (see table above)
Urine Output (UOP)	Inadequate urine output is one sign of poor end-organ perfusion	< 30 kg: > 1 ml/kg/hr ≥ 30 kg: ≥ 30 ml/hr
Central Venous Pressure (CVP)	Most accurately measured from CVL with tip at the SVC-RA junction; Femoral CVL, PICC and Broviac measurements less reliable, but trends may be useful	If CVP is high and the patient is not responding to fluid administration, consider not administering additional fluid boluses

Lactate	Elevated lactate > 4 mmol/L may be sign of shock with inadequate oxygen delivery (ref: Puskarich et al, *Resuscitation*, 2011)	< 4 mmol/L *or* ≥ 10% decrease every 2 hours
Central venous oxygen saturation ($ScvO_2$ or venous co-oximetry)	Most accurately measured from CVL with tip at the SVC-RA junction or long femoral line with tip near RA	≥ 70% *Note*: Elevated $ScvO_2$ (> 80%) may occur in sepsis due to "cytopathic hypoxia" despite ongoing shock
Hemoglobin	Hemoglobin is a primary determinant of O_2 delivery; thus, anemia should be treated in shock. Patients NOT in shock may tolerate a lower Hgb level of 7	Hgb ≥ 10 g/dL (for patients in shock - $ScvO_2$ < 70%, lactate > 4 mmol/L) Hgb > 7 g/dL (after resolution of shock)
Mental Status	Lethargy, confusion, agitation is one sign of poor end-organ perfusion	Alert and appropriate for age
Capillary Refill	Flash capillary refill can be seen in warm shock, delayed capillary refill can be seen in cold shock	< 2 seconds

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