



# **A Pocket Guide to** Blood Pressure Measurement in Children

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From the National High Blood Pressure  
Education Program Working Group on  
High Blood Pressure in Children and  
Adolescents.



**U.S. Department of Health and Human Services**  
National Institutes of Health  
National Heart, Lung, and Blood Institute

## Measurement

- Begin routine blood pressure (BP) measurement at 3 years of age.
- Correct cuff size depends on arm size. Practically speaking, correct cuff size equals largest cuff that will fit on the upper arm with room below for the stethoscope head.
- BP should be measured in the right arm of a relaxed, seated child.
- BP measurement by auscultation is the Gold Standard.
- BP by automated device correlates reasonably well with auscultation, with practical advantages of rapid measurement remote from child and elimination of reader error.
- If BP is high by automated device, repeat by auscultation.

## BP Classification/Interpretation

BP is classified by systolic BP (SBP) and diastolic BP (DBP) percentiles for age/sex/height. If SBP or DBP >90th percentile, repeat twice at same office visit before interpreting result.

**Normal BP:** SBP and DBP <90th percentile

⇒ Recheck in 1 year.

**Prehypertension:** SBP or DBP ≥90th percentile to <95th percentile or BP >120/80 mmHg to <95th percentile

⇒ Recheck in 6 months.

⇒ Begin weight management (as appropriate).

**Stage 1 Hypertension (HTN):** SBP and/or DBP ≥95th percentile to ≤99th percentile plus 5 mmHg

⇒ Recheck in 1 to 2 weeks.

⇒ If BP remains at this level on recheck, begin evaluation and treatment including weight management if appropriate.

**Stage 2 HTN:** SBP and/or DBP >99th percentile plus 5 mmHg

⇒ Begin evaluation and treatment within 1 week, immediately if symptomatic.

## Systolic BP Percentile Tables

Since diastolic HTN rarely occurs without systolic HTN in children, the SBP percentile tables on the next page can be used for HTN screening. If a child's SBP on screening is classified as prehypertension or HTN, then both SBP and DBP percentiles should be determined using the tables in the complete report: The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents. *Pediatrics* 2004 Aug;114(Suppl 2:):555-76; or [http://www.nhlbi.nih.gov/health/prof/heart/hbp/hbp\\_ped.htm](http://www.nhlbi.nih.gov/health/prof/heart/hbp/hbp_ped.htm).

## Directions for Use of Tables

1. Heights in the table are given for age at midyear. Use closest height to interpret BP.
2. **Prehypertension** SBP ≥ value from table (90th percentile) to < Stage 1 HTN value; or SBP >120 mmHg to < Stage 1 HTN value.
  - Stage 1 HTN** SBP ≥ value from the table (95th percentile) to ≤ Stage 2 HTN.
  - Stage 2 HTN** SBP > value from table (99th percentile plus 5 mmHg).

For more information go to: [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov).

## Girls SBP by Age and Height (Normal SBP is less than the prehypertensive result.)

Age ↓	BP Classification	Systolic BP (mmHg)						
3	<b>Height (cm)</b>	<b>91</b>	<b>92</b>	<b>95</b>	<b>98</b>	<b>100</b>	<b>103</b>	<b>105</b>
	Prehypertension	100	100	102	103	104	106	106
	Stage 1 HTN	104	104	105	107	108	109	110
	Stage 2 HTN	116	116	118	119	120	121	122
4	<b>Height (cm)</b>	<b>97</b>	<b>99</b>	<b>101</b>	<b>104</b>	<b>108</b>	<b>110</b>	<b>112</b>
	Prehypertension	101	102	103	104	106	107	108
	Stage 1 HTN	105	106	107	108	110	111	112
	Stage 2 HTN	117	118	119	120	122	123	124
5	<b>Height (cm)</b>	<b>104</b>	<b>105</b>	<b>108</b>	<b>111</b>	<b>115</b>	<b>118</b>	<b>120</b>
	Prehypertension	103	103	105	106	107	109	109
	Stage 1 HTN	107	107	108	110	111	112	113
	Stage 2 HTN	119	119	121	122	123	125	125
6	<b>Height (cm)</b>	<b>110</b>	<b>112</b>	<b>115</b>	<b>118</b>	<b>122</b>	<b>126</b>	<b>128</b>
	Prehypertension	104	105	106	108	109	110	111
	Stage 1 HTN	108	109	110	111	113	114	115
	Stage 2 HTN	120	121	122	124	125	126	127
7	<b>Height (cm)</b>	<b>116</b>	<b>118</b>	<b>121</b>	<b>125</b>	<b>129</b>	<b>132</b>	<b>135</b>
	Prehypertension	106	107	108	109	111	112	113
	Stage 1 HTN	110	111	112	113	115	116	116
	Stage 2 HTN	122	123	124	125	127	128	129
8	<b>Height (cm)</b>	<b>121</b>	<b>123</b>	<b>127</b>	<b>131</b>	<b>135</b>	<b>139</b>	<b>141</b>
	Prehypertension	108	109	110	111	113	114	114
	Stage 1 HTN	112	112	114	115	116	118	118
	Stage 2 HTN	124	125	126	127	128	130	130
9	<b>Height (cm)</b>	<b>125</b>	<b>128</b>	<b>131</b>	<b>136</b>	<b>140</b>	<b>144</b>	<b>147</b>
	Prehypertension	110	110	112	113	114	116	116
	Stage 1 HTN	114	114	115	117	118	119	120
	Stage 2 HTN	126	126	128	129	130	132	132
10	<b>Height (cm)</b>	<b>130</b>	<b>132</b>	<b>136</b>	<b>141</b>	<b>146</b>	<b>150</b>	<b>153</b>
	Prehypertension	112	112	114	115	116	118	118
	Stage 1 HTN	116	116	117	119	120	121	122
	Stage 2 HTN	128	128	130	131	132	134	134
11	<b>Height (cm)</b>	<b>136</b>	<b>138</b>	<b>143</b>	<b>148</b>	<b>153</b>	<b>157</b>	<b>160</b>
	Prehypertension	114	114	116	117	118	119	120
	Stage 1 HTN	118	118	119	121	122	123	124
	Stage 2 HTN	130	130	131	133	134	135	136
12	<b>Height (cm)</b>	<b>143</b>	<b>146</b>	<b>150</b>	<b>155</b>	<b>160</b>	<b>164</b>	<b>166</b>
	Prehypertension	116	116	117	119	120	120	120
	Stage 1 HTN	119	120	121	123	124	125	126
	Stage 2 HTN	132	132	133	135	136	137	138
13	<b>Height (cm)</b>	<b>148</b>	<b>151</b>	<b>155</b>	<b>159</b>	<b>164</b>	<b>168</b>	<b>170</b>
	Prehypertension	117	118	119	120	120	120	120
	Stage 1 HTN	121	122	123	124	126	127	128
	Stage 2 HTN	133	134	135	137	138	139	140
14	<b>Height (cm)</b>	<b>151</b>	<b>153</b>	<b>157</b>	<b>161</b>	<b>166</b>	<b>170</b>	<b>172</b>
	Prehypertension	119	120	120	120	120	120	120
	Stage 1 HTN	123	123	125	126	127	129	129
	Stage 2 HTN	135	136	137	138	140	141	141
15	<b>Height (cm)</b>	<b>152</b>	<b>154</b>	<b>158</b>	<b>162</b>	<b>167</b>	<b>171</b>	<b>173</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	124	125	126	127	129	130	131
	Stage 2 HTN	136	137	138	139	141	142	143
16	<b>Height (cm)</b>	<b>152</b>	<b>154</b>	<b>158</b>	<b>163</b>	<b>167</b>	<b>171</b>	<b>173</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	125	126	127	128	130	131	132
	Stage 2 HTN	137	138	139	140	142	143	144
17	<b>Height (cm)</b>	<b>152</b>	<b>155</b>	<b>159</b>	<b>163</b>	<b>167</b>	<b>171</b>	<b>174</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	125	126	127	129	130	131	132
	Stage 2 HTN	138	138	139	141	142	143	144

## Boys SBP by Age and Height (Normal SBP is less than the prehypertensive result.)

Age ↓	BP Classification	Systolic BP (mmHg)						
3	<b>Height (cm)</b>	<b>92</b>	<b>94</b>	<b>96</b>	<b>99</b>	<b>102</b>	<b>104</b>	<b>106</b>
	Prehypertension	100	101	103	105	107	108	109
	Stage 1 HTN	104	105	107	109	110	112	113
	Stage 2 HTN	116	117	119	121	123	124	125
4	<b>Height (cm)</b>	<b>99</b>	<b>100</b>	<b>103</b>	<b>106</b>	<b>109</b>	<b>112</b>	<b>113</b>
	Prehypertension	102	103	105	107	109	110	111
	Stage 1 HTN	106	107	109	111	112	114	115
	Stage 2 HTN	118	119	121	123	125	126	127
5	<b>Height (cm)</b>	<b>104</b>	<b>106</b>	<b>109</b>	<b>112</b>	<b>116</b>	<b>119</b>	<b>120</b>
	Prehypertension	104	105	106	108	110	111	112
	Stage 1 HTN	108	109	110	112	114	115	116
	Stage 2 HTN	120	121	123	125	126	128	128
6	<b>Height (cm)</b>	<b>110</b>	<b>112</b>	<b>115</b>	<b>119</b>	<b>122</b>	<b>126</b>	<b>127</b>
	Prehypertension	105	106	108	110	111	113	113
	Stage 1 HTN	109	110	112	114	115	117	117
	Stage 2 HTN	121	122	124	126	128	129	130
7	<b>Height (cm)</b>	<b>116</b>	<b>118</b>	<b>121</b>	<b>125</b>	<b>129</b>	<b>132</b>	<b>134</b>
	Prehypertension	106	107	109	111	113	114	115
	Stage 1 HTN	110	111	113	115	117	118	119
	Stage 2 HTN	122	123	125	127	129	130	131
8	<b>Height (cm)</b>	<b>121</b>	<b>123</b>	<b>127</b>	<b>131</b>	<b>135</b>	<b>139</b>	<b>141</b>
	Prehypertension	107	109	110	112	114	115	116
	Stage 1 HTN	111	112	114	116	118	119	120
	Stage 2 HTN	124	125	127	128	130	132	132
9	<b>Height (cm)</b>	<b>126</b>	<b>128</b>	<b>132</b>	<b>136</b>	<b>141</b>	<b>145</b>	<b>147</b>
	Prehypertension	109	110	112	114	115	117	118
	Stage 1 HTN	113	114	116	118	119	121	121
	Stage 2 HTN	125	126	128	130	132	133	134
10	<b>Height (cm)</b>	<b>130</b>	<b>133</b>	<b>137</b>	<b>141</b>	<b>146</b>	<b>150</b>	<b>153</b>
	Prehypertension	111	112	114	115	117	119	119
	Stage 1 HTN	115	116	117	119	121	122	123
	Stage 2 HTN	127	128	130	132	133	135	135
11	<b>Height (cm)</b>	<b>135</b>	<b>137</b>	<b>142</b>	<b>146</b>	<b>151</b>	<b>156</b>	<b>159</b>
	Prehypertension	113	114	115	117	119	120	120
	Stage 1 HTN	117	118	119	121	123	124	125
	Stage 2 HTN	129	130	132	134	135	137	137
12	<b>Height (cm)</b>	<b>140</b>	<b>143</b>	<b>148</b>	<b>153</b>	<b>158</b>	<b>163</b>	<b>166</b>
	Prehypertension	115	116	118	120	120	120	120
	Stage 1 HTN	119	120	122	123	125	127	127
	Stage 2 HTN	131	132	134	136	138	139	140
13	<b>Height (cm)</b>	<b>147</b>	<b>150</b>	<b>155</b>	<b>160</b>	<b>166</b>	<b>171</b>	<b>173</b>
	Prehypertension	117	118	120	120	120	120	120
	Stage 1 HTN	121	122	124	126	128	129	130
	Stage 2 HTN	133	135	136	138	140	141	142
14	<b>Height (cm)</b>	<b>154</b>	<b>157</b>	<b>162</b>	<b>167</b>	<b>173</b>	<b>177</b>	<b>180</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	124	125	127	128	130	132	132
	Stage 2 HTN	136	137	139	141	143	144	145
15	<b>Height (cm)</b>	<b>159</b>	<b>162</b>	<b>167</b>	<b>172</b>	<b>177</b>	<b>182</b>	<b>184</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	126	127	129	131	133	134	135
	Stage 2 HTN	139	140	141	143	145	147	147
16	<b>Height (cm)</b>	<b>162</b>	<b>165</b>	<b>170</b>	<b>175</b>	<b>180</b>	<b>184</b>	<b>186</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	129	130	132	134	135	137	137
	Stage 2 HTN	141	142	144	146	148	149	150
17	<b>Height (cm)</b>	<b>164</b>	<b>166</b>	<b>171</b>	<b>176</b>	<b>181</b>	<b>185</b>	<b>187</b>
	Prehypertension	120	120	120	120	120	120	120
	Stage 1 HTN	131	132	134	136	138	139	140
	Stage 2 HTN	144	145	146	148	150	151	152

