**Clinical Use**
- Assess renin-aldosterone axis
- Differential diagnosis of hypertension

**Reference Range**
- **Adults***: ng/mL/h
  - Supine: 0.3-3.0
  - Upright: 0.4-8.8
  - Upright/sitting: 0.65-5.0
- **Children†**: Supine Upright
  - 3-12 mo: ≤15.0 ≤15.0
  - 1-3 y: ≤10.0 ≤15.0
  - 4-6 y: ≤7.5 ≤15.0
  - 7-9 y: ≤5.9 ≤17.0
  - 10-12 y: ≤5.3 ≤16.0
  - 13-15 y: ≤4.4 ≤16.0

**Clinical Cut-off Values‡‡**
- Sodium/volume hypertension likely: <0.65
- Primary aldosteronism possible: <0.65
- Renin-mediated hypertension likely: ≥0.65
- Renovascular hypertension possible: >1.5
- Renovascular hypertension more likely: >10.0

**Clinical Background**
Renin is a proteolytic enzyme produced by the kidney. Secretion is modulated by changes in renal blood flow. Erect posture, sodium depletion, hemorrhage, and low cardiac output all increase renin secretion by reducing flow.

The measurement of plasma renin activity (PRA) is useful in evaluating hypertension. Primary hyperaldosteronism is associated with sodium retention, increased blood volume, increased renal blood flow, and low PRA. Thus, a normal or high PRA rules out primary aldosteronism. Conversely, a normal or low PRA helps rule out renal hypertension. Additionally, an elevated PRA may indicate renovascular hypertension due to renal artery stenosis.

The interpretation of PRA values is facilitated by measurements of aldosterone and serum potassium levels.

<table>
<thead>
<tr>
<th>Renin</th>
<th>Aldosterone</th>
<th>Potassium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1° aldosteronism</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Hyporeninemic hypoaldosteronism</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Method**
- Angiotensin I generation, radioimmunoassay (RIA)
- Analytical sensitivity: 0.37 ng/mL/h

**Specimen Requirements**
- 3 mL frozen EDTA plasma
- 0.4 mL minimum

Avoid refrigerated temperatures. When submitting catheterization studies, retain a portion of each sample at the referring laboratory.

Patient preparation: moderate sodium diet; ambulatory for 30 minutes; no medications, preferably for 3 weeks prior to sample collection.