**OBJECTIVE**
To test the ability of ultrasound velocity dilution to monitor absolute volume changes in rats.

**STUDY**
- 5 anesthetized male Sprague-Dawley rats were used in the study.
- 7-ml/kg per body weight was withdrawn from each rat over four steps.
- After 40 minutes, all the blood was re-infused.
- An extracorporeal AV tubing loop (priming volume 1 ml) was connected between the carotid artery and the jugular vein of the anesthetized rats. Two flow-dilution sensors were clamped on the arterial and venous sides of the loop. Blood was circulated (8 ml/min) through the loop by a pump as 0.2-0.5 ml isotonic saline was injected into the loop to measure cardiac output (CO), central blood volume (CBV, volume in lungs and heart) and actively circulating volume (ACV, the blood volume in which the indicator mixes during one minute).
- A Millar 1.0F pressure (MAP) catheter was placed into the femoral artery.

**RESULTS**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Start</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO ml/min</td>
<td>101 ± 12</td>
<td>77 ± 12</td>
<td>62 ± 7.2*</td>
<td>32 ± 4.0*</td>
<td>24 ± 3.3*</td>
<td>108 ± 20</td>
</tr>
<tr>
<td>MAP mmHg</td>
<td>72 ± 9.8</td>
<td>70 ± 14.4</td>
<td>53 ± 7.9*</td>
<td>40 ± 6*</td>
<td>18.8 ± 2.1*</td>
<td>84.2 ± 7</td>
</tr>
<tr>
<td>CBV ml/kg</td>
<td>14 ± 0.8</td>
<td>9 ± 1.0*</td>
<td>7 ± 0.8*</td>
<td>5.5 ± 0.5*</td>
<td>3.5 ± 0.5*</td>
<td>16 ± 2.9</td>
</tr>
<tr>
<td>ACV ml/kg</td>
<td>52 ± 2.3</td>
<td>41 ± 2.7*</td>
<td>31 ± 1.9*</td>
<td>25 ± 3*</td>
<td>22 ± 2.0*</td>
<td>57± 3.7</td>
</tr>
</tbody>
</table>

* (p < 0.05) difference between initial level and five steps; results, Mean ± SE

**CONCLUSION**
Ultrasound dilution was proved to be an easy tool to investigate the volume status of rats. The data suggests that CBV and ACV are the earliest predictors of blood loss.

**COSTATUS® OBSERVATIONS**
- Previously, there was no simple technique to assess the fluid status in rats during hemorrhage and resuscitation.

**REFERENCES**