OBJECTIVE: Integrity of the cells can be characterized by the measured impedance values at 200 kHz and 5 kHz Illness Marker (IM). Tracking IM over time cellular health can be predicted; may be a prognostic tool. Cells are non-conductive at low frequency (5 kHz) current passes in the extracellular space. Multifrequency bioimpedance analysis may provide insight into the compartmental changes. Multifrequency bioimpedance can be used in altered fluid distribution.

DESIGN: To assess the body composition of cardiac surgery patients to track changes in IM.

SUBJECTS / METHODS:

Basic characteristics of the patient population

<table>
<thead>
<tr>
<th>Mean±SD</th>
<th>WOMEN (MEAN±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>60.8±8.7</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>81.4±14.5</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>29±4.1</td>
</tr>
<tr>
<td>FFMI (kg/m²)</td>
<td>18.8±2.7</td>
</tr>
<tr>
<td>Fat % [kg]</td>
<td>33.9±7.8 [27.6±7.9]</td>
</tr>
<tr>
<td>TBW % [l]</td>
<td>50.1±5.7 [40.6±7.0]</td>
</tr>
<tr>
<td>Dry lean weight (kg)</td>
<td>13.3±4.9</td>
</tr>
</tbody>
</table>

IM in different types of surgeries

Randomly selected patients, who gave informed consent admitted for heart surgery. Body weight and height measured. Bioimpedance measurements done at least 3 times: at admission, in the first 24 hours following surgery and before discharge (usually 5th-7th day). Bioimpedance measurements done with Quadscan 4000.

RESULTS: Population: n=65; 70% men; 30% women.

Diabetes: 25%

Type of surgery: 62% coronary; 17% valve; 17% combined; 4% myxoma and aneurism.
Aortic cross-clamp time: 50.7±35.6 mins; Total perfusion time: 73.2 ± 47.2 mins
No significant changes in BMI, Dry Lean Weight
Significant change in ECW(%) (p<0.01) in the first 24 hours, no significant difference between the preoperative and the last measurement.
Correlation (r=0.47; r²=0.22; p<0.05) between aortic cross-clamp time and IM measured in the first 24 hours in valve and combined surgeries.

**CONCLUSION:** The unhealthy eating pattern of the patients is reflected by the body composition. Low TBW levels can be due to the decreased fluid consumption and the diuretics used.
Bioimpedance analysis is a useful non-invasive method for assessment of extracellular volume changes (ECW, ECW/ICW)
IM is significantly worse in combined and valve surgeries than in coronary surgeries.
Time of cardiopulmonary bypass (aortic cross-clamp time) explains in 15% the measured IM (r=0.38; r²=0.15, p<0.005)
**IM can predict changes in ECW during surgery (r=0.51, r²=0.25, p<0.001)**
**IM can be a useful tool in managing cardiac surgery patients**
Nutrition of patients could be individualized according to the basal metabolic rate predicted with Quadscan4000

**PUBLISHED:** Presented at ESPEN in Florence, Italy September 2008

**ORGANISATION:** Heart Institute, University of Pécs, Hungary

**RESEARCHES:** Réka Kegyes Bozó