Medical Emergency in critical environment.
Physical capacities of emergency Team

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Definition of Critical Environment

- It is critical the environment that, in order of its intrinsic morphological or geographycal peculiarities, or in order of its extrinsic peculiarities (caused by the human presence or human behaviour), induces stressful changes of the physiological conditions of people that needs our emergency aid.
- These changes are unrelated to the injuries caused by the emergency event.
- The low temperature is an intrinsic critical peculiarity of mountain areas or waters.
- The decrease of air oxygen is an intrinsic critical peculiarity of mountains areas above 2300 meters, extreme above 4000 meters. Equally the dryness of the air and the sun irradiation.
- The configuration of caverns is an intrinsic morphological peculiarity that can oblige to give the emergency aid in very small and deep areas and for a long time, sometime two, three or more days.
- The theatres of war have extrinsic critical peculiarities, very easy to guess, caused by men facing each other. These extrinsic critical peculiarities often added to the critical peculiarities of environment.
• The environment unexpectedly could become critical (natural events, earthquakes, landslides or terrorism).
Safety of Emergency Team

During the emergency work firstly we need the safety of the team. In a critical environment the high and homogeneous physical capacities of the team means greater safety.
• The change of daily habits during the last 20 years induced in the worldwide population a decrease in physical capacities.
• This is the reason of this work.
Background

• 20 years of study about the influence of physical exercise (aerobic and anaerobic) on healthy and pathological subjects.

• Application of the studies in our medical work. We proposed and we propose physical exercise as prevention, as cardiovascular rehabilitation but also as a “coadjuvant drug”.

(Sport for all Jyväskylä 2010)

• 1200 Italian Alpine soldiers were physically examined periodically over 10 years (blood tests, ECG, Fitness profile in accordance with the guide-lines of the American College of Sport Medicine) to prescribe a personalized training program to increase the performance for their mountain sports or their work in a critical environment. (Sport Medicine and Military Training Jyvaskyla 2011).
Fitness Profile Test
<table>
<thead>
<tr>
<th>Fitness Profile Report</th>
<th>SCARSO</th>
<th>UNFIT</th>
<th>MEDIO</th>
<th>FIT</th>
<th>OTTIMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Body Fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Biceps Strength (Kg)</td>
<td>43</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Dorsal Flexibility (units)</td>
<td>17</td>
<td>19</td>
<td></td>
<td></td>
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<tr>
<td>Cardiac Frequency (bpm)</td>
<td>65</td>
<td>63</td>
<td></td>
<td></td>
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<tr>
<td>Systolic Blood Pressure (mmHg)</td>
<td>134</td>
<td>124</td>
<td></td>
<td></td>
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<tr>
<td>Diastolic Blood Pressor (mmHg)</td>
<td>88</td>
<td>77</td>
<td></td>
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<tr>
<td>Aerobic Fitness (ml/kg/min)</td>
<td>53.0</td>
<td>58.0</td>
<td></td>
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<tr>
<td>Pectoral Plica mm.</td>
<td>9.0</td>
<td>6.0</td>
<td></td>
<td></td>
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<tr>
<td>Abdominal Plica mm.</td>
<td>14.0</td>
<td>9.0</td>
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<tr>
<td>Plica Quadr. mm.</td>
<td>13.0</td>
<td>8.0</td>
<td></td>
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</tbody>
</table>
Eccellente 27%  
Fit 65%  
Medio 08%  
Unfit 0%  
Scarso 0%
Conclusions

• Having a good level of aerobic fitness means having an endurance capacity for prolonged exercise, a quicker response time, a lower level of physical fatigue (improved oxygen levels in all organs and systems).

• Aerobic training guarantees a control of body weight without restrictive diets (anorexia).

• Aerobic training increases the levels of endorphins and consequently improves our mood. This is very important for the team!

• Good flexibility, good joint mobility and well distributed muscular strength ensure a well balanced distribution of weight without placing unnecessary strain on the joints. As a consequence less energy is used.
Good anaerobic fitness means having stamina during intense and short duration exercise.
• A good level of all these qualities means having “Energy reserves” and a greater margin of safety.
• In the critical environment, this means being ready and not tired in case of a change in the weather or other hostile situations.
• During emergency work “Energy reserves” means safety in dangerous situations
Having a homogeneous group means greater safety. This is evident in all hostile situations.

- The fatigue of one team element during an emergency situation slows down the whole group and can affect the final aid result.
- The fatigue of one team element in a hostile environment increases the risk of the group.
To be aware of our own fitness level means to be objectively and subjectively safer in all situations.
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