Reliable and reproducible measures are essential for accurate outcome analysis of acoustic neuroma surgery. Several authors have proposed facial nerve grading systems. The House-Brackmann Facial Nerve Grading Scale was developed for reporting outcomes in Bell’s Palsy and following removal of acoustic tumors. This reporting system has been adopted by the Facial Nerve Disorders Committee of the American Academy of Otolaryngology—Head and Neck Surgery, and is required when reporting the results of facial paralysis by the Journal of Otology-Neurotology. This scale is a useful system for measuring results when the facial nerve is intact and has sustained an incomplete injury such as Sunderland Class I-IV. When the nerve has been disrupted and a nerve graft is performed (Sunderland Class V), the scale is inappropriate. This presentation will review the reasons why the House-Brackmann Scale fails in grafted or disrupted nerves. An analysis of 27 nerve grafts and their results will be presented. A reliable, reproducible facial nerve grading system for nerve grafts based on a modification of the House-Brackmann Scale is proposed.
Which international system must be chosen to assess the facial function before and after acoustic neuroma treatment?

Robert Charachon

*Service ORL, University of Grenoble, France*

The House-Brackmann grading system is almost everywhere used to assess post-treatment facial nerve function. But the border between grade I and II between grade II and III may vary according to the interpretation of the system and to the different observers. This difficulty may undermine the reliability of reports on series.

At the video and computer era, it seems inevitable to make a choice and to recommend one of the existing automatic systems of facial movements evaluation.
Indices of facial features obtained from contour extraction with image processing and its application to objective estimation of facial palsy

Toshiyuki Tanaka, Shohei Orukawa and Takanobu Kunihiro

School of Science and Engineering, Keio University, Kanagawa, Japan

1School of Medicine, Keio University, Tokyo, Japan

House-Brackmann method is used in many countries. This method has some problems about objectivity and reproducibility. Also recovery process of facial palsy is not obtained in detail. We note that facial nerve symptoms appears in either left side or right side of face and it seems that estimating asymmetry of face as feature by image processing is helpful to House-Brackmann method. After images of facial palsy subjects are taken into computer, regions of lip and eyes are extracted from facial images using image processing based on color information. Expressions of face at resting, those at grinning motion and those at whistle motion are used as expressions for estimating facial palsy. We use the next five features as indices on mouth contour: (1) ratio of lip area, (2) grade of circle, (3) angle of mouth, (4) ratio of angle of mouth, and (5) positions of mouth edge. We also use ratio of eye’s area at resting to area at eye closing time as index based on eyes contours. Facial palsy is characterized by numerical values, which are computed from the contours of lip and eyes. Recovery process of facial palsy is shown graphically by those numerical values. Furthermore we will propose another numbering method of House-Brackmann method, which is based on the proposed indices.
**M. May's classification**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
</tr>
</thead>
</table>
| I - Superb | Some mimetic (spontaneous emotional) movement  
Individual movement  
Complete eye closure and asymmetric smile with maximal effort |
| II - Excellent | Voluntary movement  
Spontaneous expression absent  
Otherwise, same as grade I |
| III - Good | Mass movement may be present  
Eye closure complete  
Asymmetric smile with maximal effort |
| IV - Fair | Incomplete eye closure and/or very weak mouth movement |
| V - Poor | Symmetry only  
Tone intact |
| VI - Failure | Flaccid  
Tone lost  
※Final results cannot be determined until 24 months after the procedure |

*(Otolaryngol H&N Surg 1991)*


**P. W. Gidley's classification (RFNRS)**

<table>
<thead>
<tr>
<th>Score</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Normal facial function</td>
</tr>
<tr>
<td>B</td>
<td>Independent movement of eyelids and month, slight mass motion, slight movement of forehead</td>
</tr>
<tr>
<td>C</td>
<td>Strong closure of eyelids and oral sphincter, some mass motion, no forehead movement</td>
</tr>
<tr>
<td>D</td>
<td>Incomplete closure of eyelids, significant mass motion, good tone</td>
</tr>
<tr>
<td>E</td>
<td>Minimal movement in any branch, poor tone</td>
</tr>
<tr>
<td>F</td>
<td>No movement</td>
</tr>
</tbody>
</table>

*(Am J Otol 1999)*