Others believe that decompression of the facial nerve can be efficacious. The purpose of our study was to review the literature on surgical decompression of the facial nerve and to survey the active members of the American Neurology Society to determine the standards of practice in the treatment of Bell's palsy.

**Methods:** A questionnaire was developed and sent to 436 members of the American Neurology Society. The survey consisted of questions on the medical and surgical management of Bell's palsy, specifically, the type of medications recommended and whether surgical decompression was a viable option. In addition, specifics of the surgical procedure were sought. These were then correlated with the practice patterns of the respondents. A literature review on the management of Bell's palsy was undertaken and is reported.

**Results:** Results of the survey are presented. In summary, 204 of 436 surveys were completed and returned, yielding an excellent response rate of 47%. Ninety-eight percent of respondents reported using medical treatment. Of these, 82% used both steroids and antiviral medications. Surgical decompression was recommended by 62% of the members. Of these, 54% perform total facial nerve decompression, 11% perform a lateral decompression, and 27% perform a medial decompression.

**Conclusion:** Our review of the literature and survey indicate that facial nerve decompression is a viable and effective treatment for facial nerve paralysis secondary to Bell's palsy. Using strict ENOG and EMG criteria, the ideal candidate for decompression can be selected.

**Clinical Significance:** The study provides an understanding of the selection criteria for selecting patients for surgical decompression. It is also the first such survey seeking to identify trends in practice with respect to treatment of idiopathic facial nerve paralysis by members of the American Neurology Society. This study also indicates that facial nerve decompression is used by a majority of responding surgeons in treatment of select patients with Bell's palsy.

**Poster 27**

**Comparison of Electro- and Video-Eye Movement Recordings**

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**Problem:** For decades the standard system for noninvasive recording of eye movements has been electro-oculography (EOG) recording. Video technology has recently been applied to eye movement measurement, promising greater accuracy and ease of application. While credible, the claims of superiority of video over EOG recording have not been seen in the literature. This project seeks direct comparison of video and EOG techniques.

**Methods:** This project outlines the results of direct comparisons of the two techniques. EOG and video recordings were obtained simultaneously from 10 subjects. Saccade analysis, pursuit, and caloric test results were compared using two well-accepted, commercially available systems—one using EOG recording under the other system that used video technology to estimate eye position and velocity.

**Results:** Striking differences between the two systems were demonstrated, including significantly reduced estimation of amplitude and sensitivity of the EOG system. In fact, the differences between the two systems that were supposed to be measuring the same thing were disappointing. Underestimation of eye displacement during saccade testing and gain of the optokinetic system was characteristic of the EOG system. Furthermore, the correlation between slow-phase eye velocity for 424 nystagmus beats was poor (r = 0.52). The visual appearance of the waveforms was quite different, but some of these differences could be explained by differences in system parameters of the recording.

**Conclusion:** Although EOG recording has been used for decades, its accuracy and reproducibility were inferior to those of video technology in estimation of eye movements under the conditions of this study.

**Clinical Significance:** The shortcomings of EOG recording may account for some of the uncertainty and skepticism of eye movement testing.

**Poster 28**

**Normative Data for the Balance Track 500M**

Marcel Amin MD (Presenter); Marijn Gilardis MA; Horst R Konrad MD; Larry F Hughes PhD

Springfield IL

**Problem:** Computerized dynamic posturography (CDP) is commonly used to investigate balance under different sensory conditions. This study uses the Balance Track 500M, a recently designed CDP system, to establish normative data and examine the effects of aging on balance with inputs from vision, proprioception, and the vestibular system.

**Methods:** Over 300 individuals with no history of vestibular or balance deficits were examined using the Balance Track 500M. Each individual performed 4 Sensory Organization Tests (SOTs) and a Limits of Stability (LOS) test. The SOTs consisted of normal (firm surface) and uneven (perturbed surface) stability, with and without visual cues (eyes open or closed). The LOS test analyzed ability to use ankle strategies in performing anterior/posterior and lateral sway. The results were then compared across ages and sexes using analysis of variance.

**Results:** A minimum of 10 individuals from each age decade and sex were tested. For the SOT battery, significant differences (P < 0.01) were noted on both perturbed stability and the normal stability/eyes closed conditions. Specifically, a greater amount of anterior/posterior and lateral sway was seen as age increased, resulting in stability scores declining with
aging. Older individuals consistently scored lower for the LOS test. No significant differences were noted for any tests with respect to sex.

**Conclusion:** Age-related changes reduce both balance and postural stability due to a decline in all 3 sensory inputs: visual, vestibular, and proprioception.

**Clinical Significance:** To effectively prevent falls, a universal screening program should be considered for aging individuals. CDP may be used for patients with vestibular and balance deficits to identify specific sensory conditions that increase the risk for falling. The Balance Trak 500™ effectively assesses balance in both the anterior/posterior and lateral planes and aids in the development of physical and vestibular therapy programs to foster fall prevention for patients determined at risk.

Poster 29

**Electronystagmography Testing: Comparing Electro-oculography and Infrared Video**

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**Problem:** Electronystagmography (ENG) is a widely accepted method of differentiating peripheral from central, etiologies of vestibular dysfunction, as well as determining the degree of loss of function. Electro-oculography (EOG) and infrared video (IRV) are the two most commonly used diagnostic modalities for measuring nystagmus eye movements. This study was designed to compare the results of the two systems and to establish a greater understanding of their relative usefulness in the clinical setting.

**Methods:** Individuals with normal vestibular function and patients with vestibular deficits were testing using a series of ENG tests including gaze, saccade, pursuit, positional, and caloric testing. All subjects were tested with both the EOG-based and the IRV-based systems on the same day, and the order was randomized. The results of both tests were then compared using analysis of variance.

**Results:** Pursuit gains across 3 frequencies (0.1, 0.2, and 0.4 Hz), horizontal and vertical gaze, saccade velocity, positionally provoked nystagmus, and caloric results from both studies were statistically similar. However, saccade latencies and optokinetic gains for the same individuals were statistically different on the two systems.

**Conclusion:** Results from the EOG and the IRV ENG systems are comparable with the exception of optokinetic testing and saccade latencies. However, we do not believe that this is a problem with recording of measurement of eye movements by the individual systems, but rather is due to the different methods in which the target is presented to the patient.

**Clinical Significance:** When interpreting results from optokinetic studies or saccade latencies, results must be compared to normative data obtained for the particular system being used for the ENG testing.

Poster 30

**Characterization of FGF Receptors in Vestibular Schwannoma**

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**Problem:** The fibroblast growth factor (FGF) family and their receptors (FGFRs), play a critical role in nervous system development. Aberrant expression of FGFRs and/or FGFRs may contribute to tumor formation. Such abnormalities may result from either overexpression of FGFRs or a change in the pattern of FGFR expression. Vestibular schwannomas (VSs) show increased expression of mRNA for FGF-2, but this is a ubiquitous factor. The FGFR and FGF status for the remaining factors is unknown. Our aim was to demonstrate and characterize the pattern of expression of FGFRs 1, 3, and 4 in VS.

**Methods:** Fifty paraffin-embedded archival VS specimens were immunostained for FGFR-1, FGFR-3, and FGFR-4 with affinity-purified rabbit polyclonal antibodies using a standard avidin-biotin technique. Signals were graded weak, moderate, or strong by 2 independent observers. Negative controls using both specific blocking peptides and omission of primary antibodies were used. Cross-incubation with blocking peptides was also performed. Tissues known to express the receptors were used as positive controls.

**Results:** Moderate-to-strong nuclear staining was noted in 85% and 76% for FGFR-1 and FGFR-3, respectively. Cyttoplasmic and membrane staining for FGFR-1 and FGFR-3 was moderate in most specimens (55%) and weak in the remainder. In contrast the localization of FGFR-4 was predominantly perinuclear/cyttoplasmic with moderate intensity (70%). Staining with both blocking peptides and omission of the primary antibody were negative.

**Conclusion:** This is the first comprehensive study characterizing the expression of FGFRs in VS. FGFR expression patterns may dictate the biologic responsiveness of these tumors to FGFRs and the tumor-suppressor protein Merlin. VS cell cultures new have been established to characterize the pattern of FGFR gene expression and examine the interactions of these receptors with specific FGFRs and proteins.

**Clinical Significance:** The cellular localization of FGFRs in VS has not been demonstrated before. FGFRs belong to the tyrosine kinase family of receptors. Merlin, which is known to suppress growth, may mediate growth factor-specific cel-