

# ANA NJ

ACOUSTIC NEUROMA ASSOCIATION of NEW JERSEY

ANA/NJ Newsletter

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## 'Fractionated' Gamma Knife

We regret that Dr. D'Ambrosio's October 16 virtual/zoom presentation for ICON, the latest model Gamma Knife, needed to be cancelled. Dr. D'Ambrosio has commented: "I totally understand. I'd very much prefer a live meeting, myself. The virtual platform just isn't the same." Our board members will continue to look into possibilities for a return to in-person meetings.

As noted in the October 2021 Newsletter, the ICON Gamma Knife allows for frame-based or mask-based radiosurgery. Either single-session treatment using the standard skull-affixed head frame, or multiple-session "fractionated" treatment using a custom-molded plastic mask, can now be performed. This is actually a quite remarkable departure from Gamma Knife's long-term insistence on patient immobilization during treatment via the skull-affixed head frame. Back in 1999, for example, when Dr. Georg Noren experimented with fractionated Gamma Knife at the New England Gamma Knife Center in Providence, RI, patients were actually required to wear the head frame continuously for as much as five days of fractionated treatment. One of his first patients was motion picture actress and producer Victoria Paige Meyerink (See ANA/NJ Newsletter, December 2003 & notices for 1999-2000 in 'AN News', [www.ANArchive.org](http://www.ANArchive.org),

Fractionated Gamma Knife is a basic departure from Lars Leksell's firm definition of radiosurgery in 1951 as "the destruction of intra-



Gamma Knife with Mask

cranial targets without opening the skull using single high doses of ionizing radiation in stereotactically directed narrow beams." Dr. David Larson, in his article for the Newsletter entitled "From Traditional Radiotherapy to Stereotactic Radiosurgery" (April, 2018), recalls how "There was initially the notion that it's not 'radiosurgery' if you do more than one fraction. If you do two fractions you can't call it radiosurgery . . . [But now] all the radiosurgery apparatus manufacturers build SRS apparatus in such a way that one can accurately deliver more than one fraction. I think as time goes by we are going to see more and more patients get perhaps two or three fractions."

The emerging new treatment protocol has been named 'hypofractionated radiosurgery'. Neurosurgeons at Rutgers University in NJ have published: "Assessment of Motion Error for Frame-based and Noninvasive Mask-based Fixation using the Leksell Gamma Knife Icon Radiosurgery System, *Journal of Neurosurgery*, Vol. 129 (December 2018).

## ANA/NJ

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## Notices!

- Dr. Samuel Selesnick and colleagues at Weill Cornell in NYCity have published “Trends in Hearing Rehabilitation Use Among Vestibular Schwannoma Patients,” *Laryngoscope*, Vol. 130 (June, 2020), reporting that very few post-treatment patients at their institution (2000-2018) have used a hearing rehabilitation device. “Patients who did not pursue hearing rehabilitation were either not bothered by their deficit or were unaware of their options. Many did not remember being counseled about hearing rehabilitation options, indicating that regular and repeated counseling may be needed to increase patient utilization of hearing rehabilitation after VS treatment.” In this regard, Dr. Hillary Snapp and colleagues (University of Miami, Florida) have published “Hearing with One Ear: Consequences and Treatments for Profound Unilateral Hearing Loss,” *Journal of Clinical Medicine*,” Vol.9 (2020) - free full text article available at [www.pubmed.gov](http://www.pubmed.gov). See also our article below (pp.4-5) entitled “Guidelines for Cochlear Implantation for Single-Sided Deafness (SSD).”
- A clinical textbook for acoustic neuroma with chapters by experts covering all aspects of vestibular schwannoma management is *Comprehensive Management of Vestibular Schwannoma*, edited by Matthew L. Carlson, MD, Mayo Clinic (Thieme Publishers, 2019). 84 Chapters, 569 pp.
- Attention is called to two recent articles in “*The Connection*,” the newsletter of the Acoustic Neuroma Association of Canada (Spring 2022): (1) Jennifer Harris, “Options for SSD”, with tables and illustrations; and (2) Judit Dundan, “My Uninvited Guest,” about choosing between Retrosigmoid surgery and Gamma Knife radiosurgery for a 1.9 cm acoustic neuroma. (Go to [www.anac.ca](http://www.anac.ca), and navigate to Members, Resources, Our Newsletters)
- For reliable and timely information about Neurofibromatosis Type 2 (NF2), the heritable genetic disorder that can result in bilateral acoustic neuromas (VSs) - about 1 in 40,000 births - see online the website of the National Human Genome Research Institute (NIH), describing the disorder, its symptoms, diagnosis and treatment. Additional resources are cited, including Medline Plus – Neurofibromatosis Type 2; Genetics Home Reference NF2; and Genetics Testing Registry NF2.

## Radiosurgery (SRS) for Small Tumors?

Should radiosurgery (SRS) be a primary treatment for small (<1.5 cm) intracanalicular acoustic neuromas? Numerous studies have evaluated the timing of intervention and the relative benefit of early SRS for newly diagnosed patients.

Researchers at the Center for Image-Guided Neurosurgery, University of Pittsburgh School of Medicine, have developed a “Pittsburgh Hearing Prediction Score” (PHPS) to help predict long-term hearing preservation rates in patients who undergo SRS (Stereotactic Radiosurgery) while they still have serviceable hearing. The PHPS evaluates parameters including age, tumor volume, hearing status, disequilibrium, tinnitus, Koos tumor volume, sex, and tumor margin dose. Scoring assigns a total of 5 points based on patient **age** (1 point if <45 years, 2 points if 45-59 years, and 3 points if ≥60 years); tumor Koos grade **volume** (0 points if <1.2 cm<sup>3</sup>, 1 point if ≥1.2 cm<sup>3</sup>); and Gardner-Robinson **hearing** grade (0 points if grade I hearing, 1 point if grade II hearing).

The PHPS was used for a 2019 study involving 307 patients. At a median of 7.6 years after SRS (range 1-23 years), the overall serviceable hearing preservation rate was 77.8% at 3 years, 68.8% at 5 years, and 51.8% at 10 years. “The serviceable hearing preservation rate was 92.3% at 10 years in patients whose score total was 1. In contrast, none of the patients whose PHPS was 5 maintained serviceable hearing at 10 years. The best long-term hearing preservation rates were found in younger patients with smaller tumor volumes.”<sup>1</sup>

A more recent Pittsburgh study (2021) evaluating outcomes of SRS as the first-line treatment concluded that patients with initially better hearing and smaller VSs had enhanced hearing preservation up to 10 years after SRS.<sup>2</sup> The authors identified 209 patients who underwent SRS as the primary intervention. One hundred fifty-five patients (74%) had serviceable hearing (Gardner-Robinson [GR] hearing grades I and II) at the time of SRS. The median patient age was 54. The median tumor volume was 0.17 cm<sup>3</sup>. The median dose to the tumor margin was 12.5 Gy. **Results:** At the time of SRS, the serviceable hearing preservation rates in GR grade 1 and II patients were 76.6% at 3 years, 63.5% at 5 years, and 27.3% at 10 years. . . . Subsequently [after a 10 year observation period], patients with GR grade I VS showed increases to 88.1% at 3 years, 77.9% at 5 years, and 38.1% at 10 years. The hearing preservation rates of patients with VSs smaller than 0.14 cm<sup>3</sup> showed increases to 85.5% at 3 years, 77.7% at 5 years, and 42.6% at 10 years.

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<sup>1</sup> S.Johnson, L.Dade Lunsford et al, “Predicting Hearing Outcomes before Primary Radiosurgery for Vestibular Schwannomas,” *Journal of Neurosurgery* (Sept 6, 2019).

<sup>2</sup> A.Ogino, L.Dade Lunsford et al, “Stereotactic Radiosurgery as the First-Line treatment for Intracanalicular Vestibular Schwannomas,” *Journal of Neurosurgery*, Vol. 135 (Feb 2021).

## Guidelines for Cochlear Implantation for Single-Sided Deafness (SSD)

A special task force of the American Cochlear Implant Alliance has prepared a report that reviews “the current evidence relevant to the assessment and management of adults with SSD [1,147 studies]. A systematic review was also conducted on the published studies [42 studies] that investigated outcomes of cochlear implant use on measures of speech recognition in quiet and noise, sound source localization, tinnitus, and quality of life for this patient population.<sup>3</sup> In italics, selected excerpts from this report are as follows:

• *Historically, the common clinical recommendation for adults with SSD were either to remain in an unaided condition or listen with a hearing technology that reroutes the acoustic signal from the impaired ear to the NH-ear [normal hearing ear], such as a bone conduction device (BCD) or contralateral routing of the signal (CROS) hearing aid. While rerouting technology provides users with access to the signals on the impaired side, significant improvements on spatial hearing tasks are limited because of reliance on monaural processing by the NH-ear. . . Alternatively, cochlear implantation of the impaired ear allows for stimulation of both auditory pathways, thereby potentially improving performance on spatial hearing tasks, including sound source localization and speech understanding in spatially separated noise.*

• *To date, there is somewhat limited evidence of the degree of benefits that might be realized for individuals with SSD associated with vestibular schwannoma. Cochlear implantation can be considered after radiosurgery, microsurgery, or in the treatment of individuals with stable tumors during wait-and-scan management. If there is a history of prior microsurgical tumor resection, then the operative note, postoperative imaging, and postoperative audiometric results need to be reviewed to determine whether the cochlear nerve was preserved and the cochlea has not developed prohibitive ossification. Successful stimulation with a CI requires sufficient cochlear nerve health. . . {and} auditory nerve integrity is a key predictor of outcomes. . . Currently, there are no large cohort studies describing outcomes of CI use for individuals with vestibular schwannoma with a contralateral NH-ear.*

• *Duration of deafness is a known predictor of CI outcomes in bilateral deafened individuals, with early intervention being positively associated with improved performance. While less is known about the effects of duration of deafness on CI outcomes in individuals with SSD, consideration is recommended for the potential effect of long duration of SSD on functional outcomes. . . Investigations of functional outcomes for adult CI recipients after prolonged durations of SSD are limited in number and include small cohorts. [Studies] suggest the limited ability of the auditory system to make use of bilateral hearing cues after long periods of unilateral hearing.*

(Cont., p.5)

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<sup>3</sup> See M.Dillon (Univ.of NC), A.Kocharyan (Mayo Clinic) ,G.Daher (Mayo Clinic), M.Carlson (Mayo Clinic), W. Shapiro (NYU), H.Snapp (Univ.of Miami), J. Firszt (Washington Univ.), “American Cochlear Implant Alliance Task Force Guidelines for Clinical Assessment and Management of Adult Cochlear Implantation for Single-Sided Deafness,” *Ear and Hearing*, Vol.43 (2022). A free full text copy is available at [www.PubMed.Gov](http://www.PubMed.Gov). The American Cochlear Implant Alliance, established in 2010, is a not-for-profit advisory organization of professionals in cochlear implantation. Its major goal is to improve access to and increase awareness about cochlear implantation. *Ear and Hearing* is published on behalf of the American Auditory Society.

(Guidelines, Cont.)

- *The status of the contralateral ear is another important consideration. . . The possibility of acquiring significant bilateral hearing loss warrants consideration. Additional consideration should be given to the potential benefits of early implantation of the impaired ear for long-term performance benefits.*
- *For adults with SSD, advanced age is not a contraindication to cochlear implantation. . . Older adults may demonstrate poorer performance compared to younger adults for specific listening situations, such as listening to a target-directed toward their CI in the presence of background noise. At present, cochlear implantation for SSD is not covered by Medicare, resulting in an insurmountable barrier for beneficiaries (who represent most adults over the age of 65 years in the United States) to access cochlear implantation as a treatment for their hearing loss.*
- *It is recommended that non-surgical options are discussed with adult cases of SSD, and where possible, that patients are offered a trial with a non-surgical hearing technology before undergoing cochlear implantation.*
  - *It is recommended that individuals with sudden and/or rapid progression of SSD undergo monitoring to determine if the hearing spontaneously improves or is recoverable with treatment, and that cochlear implantation should not occur earlier than 3 to 6 months after the sudden hearing loss to allow ample time for potential recovery of hearing.*
  - *Reduced tinnitus severity is frequently reported after cochlear implantation and/or with CI use. It is recommended to obtain subjective measures preoperatively to establish a baseline of tinnitus severity that can be compared to postoperative and post-activation perceptions.*
  - *Wear time of the CI is associated with outcomes for adults with SSD. A minimum of 8 hours of device use per day is recommended. Auditory training is recommended within the initial months of C*
- *The systematic review of published studies found CI use has a high probability (>75 to 100%) of improving speech recognition in the CI-ear, sound source localization, tinnitus perception, and quality of life for adults with SSD.*

The following studies are among the 141 references listed by the report. Abstracts and some free full text copies are available at [www.pubmed.gov](http://www.pubmed.gov).

- J Galvin et al, "Benefits of Cochlear Implantation for SSD: Data from the House Clinic. . . Clinical Trial," *Ear and Hearing*, Vol 40 (2019).
  - Kitterick et al, "Hearing Instruments for Unilateral Severe-to-Profound Sensorial Hearing Loss in Adults," *Ear and Hearing*, Vol 37 (2016).
  - A. Nassiri et al, "Speech Perception Performance Growth. . . after Cochlear Implantation for SSD," *Otology & Neurotology*, Vol 43 (2022).
  - C.Sullivan et al, "Long-term Audiologic Outcomes after Cochlear Implantation for SSD," *Laryngoscope*, Vol 130 (2020).
  - H.Snapp & S.Ausili, "Hearing with One Ear: Consequences and Treatments for Profound Unilateral Hearing Loss," *Journal of Clinical Medicine*, Vol 9 (2020).
  - N.Thompson et al, "Translabyrinthine Excision of VS with Concurrent Cochlear Implantation: Systematic Review," *Journal Neurol Surgery B Skull Base*, Vol 80 (2019).
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*February 1, 2021 – January 31, 2023*

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All the good work ANA/NJ does!  
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*Hurrah!*

*“An In-Person, Open Discussion Meeting for AN Patients,  
Family and Friends!”*

**Sunday, April 16, 2023 1:00 – 4:00 p.m.**

**Princeton Medical Center/ Penn Medicine at Plainsboro**



Penn Med Princeton, One Plainsboro Rd

ANA/NJ is pleased to be able to schedule this in-person support group meeting to be held in the Education Center, Princeton Medical Center/Plainsboro! This excellent facility is easy to get to and has ample free parking. Educational materials and refreshments will be provided.

It's important to let Wilma Ruskin know as soon as possible that you plan to attend this special meeting. Please email Wilma a brief "Yes, I plan to attend!" ([wruskin33@aol.com](mailto:wruskin33@aol.com)), or phone 609-510-9039. Thank you.

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**Directions** (for maps and photos, visit [www.princetonhcs.org](http://www.princetonhcs.org))

- Going north on **Route 1**, make a right turn at the sign onto **Plainsboro Rd**, and then use the jughandle at the traffic signal to make a left onto **Punia Blvd**. Go for a short distance on Punia Blvd until the sign for **Parking Lot V2**. Park in Lot V2.

**Notice:** The main entrance to the hospital with its portico will be on your left, but park close to the hospital wing with the grassy area that stretches to the right. A direct entrance to our meeting room in the Education Center will be at the end of the walkway seen there. Look for the ANA/NJ sign!

- Going south on **Route 1**, take the overpass over Route 1 for **Scudders Mill Rd**. Bear right onto **Campus Rd** and go to the traffic signal. Turn right onto **Hospital Dr** and then quick left onto **Punia Blvd** to the sign for **Parking Lot 2**. (See the above Notice for direct entrance to the meeting room.)



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