出國報告

(出國類別：開會)

第 55 屆美國神經放射線醫學會年會

服務機關：國防醫學院三軍總醫院

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赴派國家：美國

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摘要

一年一度的美國神經放射線醫學會年會今年是在洛杉磯加州長灘的長灘會議及娛樂中心舉行。這個會議整合了許多的學會，包括美國功能性神經放射線醫學會、美國頭頸部放射線醫學會、美國小兒神經放射線醫學會、美國脊椎放射線醫學會、美國神經介入外科醫學會、美國神經放射線醫學會健康政策委員會、美國神經放射線醫學會電腦科技及資訊學、美國神經放射線醫學會研究科學家委員會、美國神經放射線醫學會、以及國際水腦影像工作小組/腦脊髓液流工作小組等。光是把這些學會機構列出來，就可以一窺 2017 年美國神經放射線醫學會年會將在哪些領域上提供美國乃至於世界頂尖的研究成果。

短短幾天的會議，內容相當豐富，既深且廣，鉅細靡遺。前兩天的研討會，國際級的大師們已經以最前瞻的議題為這場會議揭開了序幕。年會中每日個案都令人想破了頭而未必能切中答案，也算是要勉勵我們在診斷的路上要持續進修、終身學習。每一種疾病的偵測、診斷、定性、定量、預後的預測、治療後的追蹤等，似乎都有了嶄新的進步。

每個領域都有一群頂尖的研究學者投入，每個研究成果或多或少也都帶來了一些改變。來到這裡，基本上就是來體驗一下這研究領域的進步到底有多快。另一方面，也看看我們的研究在該範疇是否具有競爭力，了解本身的力量(Strength)、弱點(Weakness)、機會(Opportunity)、與威脅(Threat)究竟在何處。

工欲善其事，必先利其器。正當看著世界日新又新的進步的同時，我們回顧一下我們的國家，看一看所處的醫院，再檢視一下自己。面對 2018，世界神經放射學聯合會研討會(World Federation of Neuroradiology Symposium；WFNRS)將在台灣舉行。這是台灣向國際社會展示我們的努力與成果的時候，也將會是台灣每個醫院可以將觸角伸到地球每一個角落的機會。培養及訓練新一代的人才，發展具競爭力的診斷及研究工具，深耕台灣特定領域的疾病研究，開發與維持跨領域的合作，將會是我們未來要不斷操練的作業。

本次會議結束之後，期待 2018 甚至將來，我們可以持續為神經放射領域做出一番貢獻。

目次

本文

一、 目的

這次出國開會的源起是來自於一次偶然的機會與住院醫師一起閱片，看到一份聽神經瘤的磁振造影影像，正如往常所看到的。當下，我們很好奇神經內外放射科等專家學者是如何看待聽神經瘤，也想進一步知道神經放射科在聽神經瘤可以扮演什麼樣的角色。

為了回答上述的問題，我們查閱期國際刊文獻。除了得到一些答案之外，卻也發現了一些問題尚待回答。測量聽神經瘤所需的時間與測量的準確性是我們首先關心的問題。於是我們開啟了一項簡單的研究，就是使用公認為標準的平面測量法與一些體積估算公式來測量聽神經瘤的體積並記錄每次測量所花的時間。有了初步的研究成果之後，一方面開始文章的投稿，另一方面剛好遇上美國神經放射線醫學會年會的徵稿，於是就開起了這趟美國之行。

本次參加會議的目的有三。

第一、指導：指導並陪伴住院醫師參與國際會議的口頭發表：

研究成果能夠獲得美國神經放射線醫學會年會得以上台口頭報告，這是對住院醫師來說將是一個相當難得且難忘的經驗，不能搞砸。

第二、了解：了解目前神經放射領域發展的現況：

神經放射診斷與治療是這領域不變的兩大方向。這次來可以趁機會了解一下各個診斷領域發展的狀況，作為回國後臨床服務的重要參考。

第三、探索：探索未來發展的方向

由於我們持續有研究正在進行，了解一下外在環境，知道從事類似研究主題的陣營的方向與進度是很有幫助的。此外，藉此若能發現一個未來可以投入而且可能會有成果也很重要。

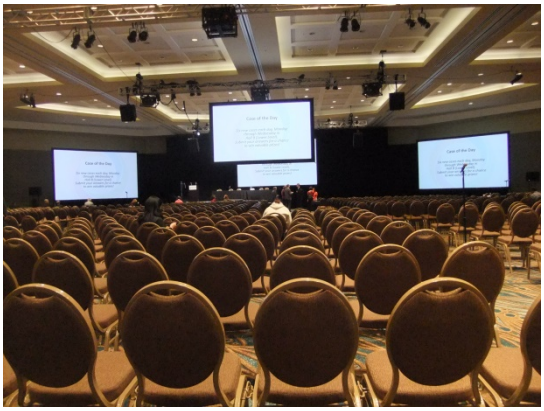
二、 過程

第一、準備：問題問了，研究做了，成果也有了。剩下來的就是專心在口頭報告的準備。由於第一次出國參加國際會議，沒有經過任何的緩衝就得全程以英文在國際舞台發表口頭報告，如何能夠準確地控制時間並且簡明扼要的介紹我們的研究變成為了何醫師最大的挑戰。我們得將繁複的研究數據加以精簡，去蕪存菁，成為可以在六分鐘報告完的投影片，。接下來是反覆練習，修正，希望熟能生巧。終於在報告當天早上可以不多不少，恰好以六分鐘的時間順利完成報告。

第二、交通：到加州長灘開會在交通上來說是一件很友善的過程。從台灣出關、搭機、洛杉磯機場入關，都相當順暢。從洛杉磯機場到會場有許多選擇，從自行開車、搭公車、捷運、以及 UBER 都可以。自行開車與搭 UBER 所需時間最短，只需 30 分鐘就可以抵達，但是最貴。搭公車最便宜，但是時間最久，至少要兩個鐘頭到三個鐘頭。搭捷運可以說是最佳選擇，優點多多。第一、系統與台北相似，只要搭乘捷運綠線再接捷運藍線，簡單不易搞混，唯一的問題就是上了車後卻睡過頭。第二、價格便宜:只要先花美金 1 元購買 tap card，然後再加美金 1.75 元加購行程比如說 one-way trip，就可以搞定。第三、可以親身體驗當地人的交通與生活方式。

第三、網路：機場、飯店與會議中心都有免費的網路，有了網路就等於有了世界，樣樣都可以搞定。沒有網路的地方也可以使用離線導航的功能，可以事先下載離線導航 APP，在機場、飯店與會議中心三地之間就不用怕迷路了。當然也可以購買網路卡，直接就可以隨時隨地都可上網了。

第四、會議：這裡有各式各樣的研討會、演講、課程、報告、電子海報、與傳統海報。會議場地相當大，同時有多個投射螢幕可以同時滿足坐在前排或後排，左側、中間、或右側觀眾的需求。即時網路線上作答與統計，這個就厲害了，有的會議中會開放觀眾即時限時上網作答，即時公布正確答案並統計各個答案觀眾選擇的百分比。你看你作答、你被評估、你知道全部人回答問題的分布。會議最後還會即時統計每個觀眾的成績，也就是答對率，並且公布成績最高的前三名，獎金分別為 1500、1000、及 500 美元。



第五、論文報告之內容：

一、論文題目：Estimating the Volume of Acoustic Neuromas Using "Ice Cream Cone" Method Compared with the ABC/2 Formula and the Planimetry Method

二、論文發表類別：口頭報告

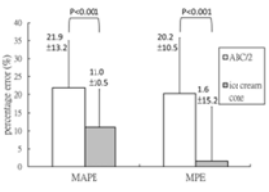
三、論文英文摘要：

Purpose:

To estimate the volume of acoustic neuromas by a newly proposed "ice cream cone" method in comparison with the ABC/2 formula and the planimetry method.

Materials and Methods:

Approved by a local institutional review board, 100 acoustic neuromas examined by MRI during January 2011 to November 2015 were enrolled retrospectively. Informed consent was waived. Volume of acoustic neuromas was estimated by an ice cream cone method (D^2H/4 + ABC/2) and the ABC/2 formula by 2 observers when compared to the volume measured by the planimetry method as gold standard. Patients were further classified into 3 subgroups according to tumor volume, including small (<1 ml; n=34), medium (1 ml ~ 4 ml; n=33), and large (>4 ml; n=33) groups. Estimation error was evaluated. Statistical analysis included intraclass correlation coefficient (ICC), linear regression analysis, one-way analysis of variance, and paired-t test with P <0.05 considered as statistical significance.



Results:

The overall tumor size was 4.80 ± 6.8 ml (mean ±standard deviation). All ICCs were no less than 0.992. The tumor sizes estimated ABC/2 formula and the ice cream cone method were both highly correlated with that measured by the planimetry method (both R-squared>0.991, P<0.001). The ABC/2 formula overestimated tumor size by 21.85 ± 13.15% than the ice cream cone method (11.01 ± 10.47%) significantly (P<0.001). Subgroup analysis showed significant

difference between 2 methods only in medium and large size groups (P<0.001).

Conclusions:

The ice cream cone method allows quantifying the volume of acoustic neuromas more accurate than the ABC/2 formula.

四、論文重點摘錄：

(一) 創新概念與創新方法：本篇論文所提出用以評估聽神經瘤體積的 Ice Cream Cone Method(ICCM)是以前研究領域所為曾提出過的創新概念與創新方法。

(二) 創意來源：本篇論文的創意來源就是來自於聽神經瘤本身因為會從內耳道(internal acoustic canal)擴展到小腦橋腦腳池(cerebellopontine angle cistern)而形成類是冰淇淋的特殊型態。

(三) 重要結果：本研究發現我們所提出的 ICCM 想對於過往較常被使用的 ABC/2 公式而言，可以顯著較低的絕對誤差百分比與誤差百分比(Absolute Percentage Error； APE)以及絕對百分比與誤差百分比(Percentage Error；PE)。進一步說，ICCM 可以把 ABC/2 公式的代表測量準確的絕對誤差百分比與誤差百分比平均值(mean APE)由 21.9%降低一倍到 11.0%，而把代表測量偏差的誤差百分比與誤差百分比平均值(mean PE)由 20.2%降低十二點五倍到 1.6%。也就是說 ICCM 無論在測量的準確度與偏差方面都遠遠優於時下流行的 ABC/2 公式。

第六、報告後續相關議題：

(一) 下一個報告恰好就是美國 IOWA 大學 G Bathla , B Policeni, 還有 M Hansen 等人，以 ABC/2 公式來測量聽神經瘤的體積。而他在摘要所列出的五篇參考文獻當中就有我們團隊過去曾經發表過的兩篇文章，分別是在 2009 年在 Acta Radiologica 所發表的 Volume-dependent overestimation of spontaneous intracerebral hematoma volume by the ABC/2 formula，以及在 2013 年在 Clin Neurol Neurosurg 所發表的 Calculating the tumor volume of acoustic neuromas: comparison of ABC/2 formula with planimetry method。這篇文章採用我們在 Acta Radiologica 的文章中所提出的 ABC/2 對於大腦血塊體積測量誤差會因為血塊體積大小而不同的概念。也因此，我們團隊在體積測量方面的研究成果已經在 2017 年美國神經放射線醫學會年會，經由 IOWA 團隊的介紹而揚名國際了。

(二)　會後用餐也遇到來自美國的放射科醫師來詢問 ICCM 是如何測量等相關的問題。在這當中，我們有機會與美國當地的醫師針對聽神經的診斷與治療等相關議題彼此交換心得與意見。回想起來，這何嘗不是給我們年輕一輩的住院醫師一種肯定與鼓勵呢。

第七、會議內容分享：

以聽神經瘤為例子，放射科醫師在聽神經瘤扮演什麼樣的角色?

一、找到腫瘤：找到大的腫瘤並不稀奇，如何找到小的腫瘤，隱而未現的腫瘤成為研究學者爭相競逐的目標。

二、鑑別診斷：這個議題在這次會議中並沒有受到太大的注意。

三、避免顯影劑的注射：非顯影之影像與對比劑顯影的影像似乎可以達到旗鼓相當的腫瘤偵測準確度。如此，對於特定的病患例如對對比劑過敏或是腎功能不全者是一大福音，因為非顯影之影像照樣可以相當準確的偵測到聽神經瘤。

以聽覺喪失為例子，影像相較於過去有什麼樣的進步?

一、降低掃描時間，卻維持相當影像品質：例如 compressed sensing 重組技術可以允許比 Nyquist 定律更少的 K 空間取樣，進而減少 80%的掃描時間，卻又同時維持足夠的診斷影像品質。

二、評估耳蝸的膜質迷宮 (membranous labyrinth of cochlea)的信號：FLAIR 影像與對比劑顯影之 FLAIR 影像 對於 Meniere's disease 而言，皆可觀察到相當的信號增加。再一次挑戰非顯影 MR 影像對於疾病的價值並不亞於顯影 MR 影像。

三、評估耳蝸細微結構，R2 角度與深度：使用原本用來來評估顳骨 3D T2 權重影像來評估，耳蝸 R2 角度與深度。做為未來評估發育性耳蝸異常 Scala Communis 之基礎。

以唾液腺腫瘤為例子，今年的會議有什麼新的亮點?

一、　以外科手術觀點切入：認為準確的描述腫瘤的範圍、神經侵犯及淋巴結侵犯的可能性，以及是否有轉移相當重要。

二、　腫瘤本身的組織特異性並不影響外科手術策略的選擇與決定。

以唾液腺腫瘤為例子，今年的會議有什麼還沒回答的問題?

一、　如何分辨淋巴癌與非淋巴癌：淋巴癌的治療方式並非手術切除，而是化學治療。因此，術前能診斷淋巴癌還是相當重要的。

二、　如何分辨沃辛瘤(Warthin’s tumor)與其他腫瘤：比起其他腫瘤，沃辛瘤不但是良性腫瘤，也幾乎不會惡性轉型(malignant transformation)。治療策略上是可以不手術切除，單單觀察的。因此，若術前能診斷沃辛瘤也是相當重要的。這一點我們已經有研究成果，正在投稿過程當中，若能獲得評審的青睞，將有機會避

免沃辛瘤的患者因為接受手術切除所導致的各項後遺症，包括面神經麻痺、唾液滲漏、傷口感染等問題。

三、 唾液腺惡性腫瘤的影像特徵是否可以成為治療效果，乃至於預後的預測因子。在這個資料探勘與深度學習的時代當中，這個問題將在不久的將來獲得答案。

三、 心得及建議

這次的心得有三：

第一、他山之石，可以攻錯。他山之縫，可以生存。出了國門，一方面可以知道自己不足之處，繼續努力；另一面也可以了解別人所遺留下來的問題，可以放手一搏，指引後進一個方向。

第二、學海無涯，生命卻有盡頭。如何在有限的光陰裡，找到一片可以耕耘，耕耘後又看到成果的田地，將成為每個後起之秀有趣的課題。

第三、以一己之力，難以竟天下之功。如何找到夥伴，形成一個跨領域且多功能的團隊，又是另一個值得拿來消磨時間的新境界了。這次看到台北榮總由郭萬祐部長所帶領的研究團隊在 4-dimentional digital subtraction angiography 等血管攝影領域有多篇報告，台北醫學大學附設醫院由陳震宇研究副部長及中華民國神經放射線醫學會理事長所帶領的研究團隊發表 mild Traumatic Brain injury 之神經纖維受損及放射基因體學在膠質母細胞瘤的相關研究。其實同時台灣有相當多的神經放射影像領域的專家例如本院的高鴻文醫師等也在同時間也到美國夏威夷參加第 25 屆國際磁振造影學會年會並發表。此外，我們與逢甲大學的研究團隊也有兩篇論文被接受在該會議發表。

這次的建議有二：

第一、感謝科技部的支持，讓我們可以出國開拓視野，也為國家研究盡一份心力。建議可以提供更充裕的經費補助，讓更多研究專家學者走出去為國爭光。

第二、2018 年，世界神經放射學聯合會研討會將在台灣舉行。根據神經放射線醫學會陳理事長所透露，這個會議將邀請高達兩百多位國際知名學者參與並演講。相信若有國家層級的支持與經費補助，2018 年將會是台灣在國際舞台上再次綻放光芒的一年。

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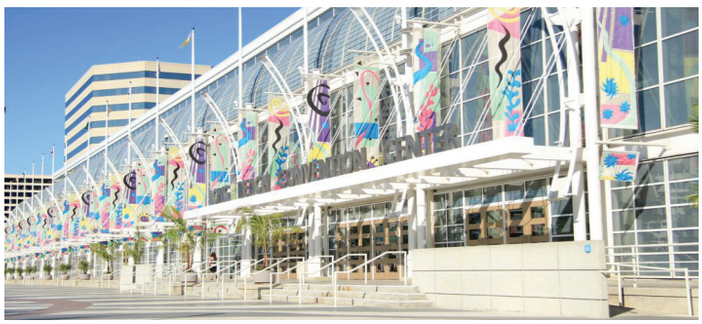

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Society of NeuroInterventional Surgery (SNIS)
Blaise W. Baxter, MD

American Society of Neuroradiology (ASNR) Health Policy Committee
Robert M. Barr, MD, FACR

Computer Sciences & Informatics (CSI) Committee
John L. Go, MD, FACR

Research Scientist Committee
Dikoma C. Shungu, PhD and Timothy, P.L. Roberts, PhD

The International Hydrocephalus Imaging Working Group (IHIWG)/CSF Flow Group
William G. Bradley, Jr., MD, PhD, Harold L. Rekate, MD and Bryn A. Martin, PhD

Abstract Deadline: Friday, December 9, 2016
Please visit www.asnr.org/2017 for more information

ASNR 55th Annual Meeting
c/o American Society of Neuroradiology
800 Enterprise Drive, Suite 205 • Oak Brook, Illinois 60523-4216
Phone: 630-574-0220 • Fax: 630 574-0661 • www.asnr.org/2017

2017 ASNR Long Beach, California
Discovery Didactics Diagnosis Delivery

ASFNR ASHNR ASPNR ASSR SNIS
THE FOUNDATION OF THE ASNR

Come to the beach! Please join us in Long Beach, California, April 22-27, 2017, for the 55th Annual Meeting of the ASNR. Known for its 5.5 miles of Pacific Ocean waterfront, this southern California beach resort boasts a blend of city sophistication and seaside serenity. ASNR is delighted to provide a **"4D"** focus for this meeting, as depicted by our meeting logo: ***Discovery and Didactics*** for The Foundation of the ASNR Symposium 2017: ***Diagnosis and Delivery*** for the ensuing Annual Meeting Program.

Centered on Discovery and Didactics, the symposium will feature sessions on "What's New?" in the role neuroimaging plays defining CNS disease mechanisms and how to best prepare for "What's Next?" for our subspecialty in terms of training, teaching, and leading the process of lifelong learning. The annual meeting programming will address best practices in Diagnosis and Delivery, as we strive to provide value, promote quality in better health and care and consider cost. Our discussions will consider how to navigate the changing landscape of healthcare reform and reimbursement as subspecialists in a field that is changing at an equally "fast forward" pace!

Hyatt Regency Long Beach

Westin Long Beach

	The Foundation of the ASNR Symposium 2017: Discovery and Didactics	The Foundation of the ASNR Symposium 2017: Discovery and Didactics	ASNR 55th Annual Meeting: Diagnosis and Delivery	ASNR 55th Annual Meeting: Diagnosis and Delivery	ASNR 55th Annual Meeting: Diagnosis and Delivery	ASNR 55th Annual Meeting: Diagnosis and Delivery	CSF/IHIWG - Work Flow Group
	Sat., 4/22	Sun., 4/23	Mon., 4/24	Tues., 4/25	Wed., 4/26	Thurs., 4/27	Fri., 4/28
	The Foundation of the ASNR 2017	**The Foundation of the ASNR 2017**	**ASNR 55th Annual Meeting** (SNIS/ASFNR/ASSR)	**ASNR 55th Annual Meeting** (ASHNR/SNIS/ASSR/SILAN/ AOSNHNR/ASFNR)	**ASNR 55th Annual Meeting:** (ASHNR/ASPNR/ESNR/CSF)	**ASNR 55th Annual Meeting:** (ASPNR/ASHNR/SNMMI/CSF)	**CSF/IHIWG - Work Flow Group**
Morning		**Breakfast Concession Stands**	**Breakfast Concession Stands**	**Breakfast Concession Stands**	**Breakfast Concession Stands**	**Breakfast Concession Stands**	**Breakfast Concession Stands**
		A Look to the Future of Cerebrovascular Treatment and Training	One Hour SAM Session - Pediatrics (AR) (SAM)	One Hour SAM Session -ASHNR: (AR) (SAM)	One Hour SAM Session - Vascular (AR) (SAM)	One Hour SAM Session - Spine (AR) (SAM)	CSF/IHIWG Work Group-All Day (Registration & Fee Required)
		One Hour SAM Session - TBD (AR) (SAM)	Special Session: Taking the Lead!	Healthcare Policy Programming Updates	ASPNR: Making the Call: Abusive CNS Trauma	ASHNR: Diagnosis: Important Concepts in Head & Neck Cancer Imaging	
				AJNR Report	ESNR Session	ASPNR: The Present and Future of Pediatric Brain Tumor Neuroimaging	
						CSF/IHIWG Working Group: Hydrocephalus	
				ASNR Annual Business Meeting	Evidence Based Medicine: Measuring the Quality of MIPS Quality Measurements (SAM)- (Arliss Pollock Memorial Lecture)	ASNR/SNMMI Session	
		Morning Beverage Break	**Morning Beverage Break**	**Morning Beverage Break**	**Morning Beverage Break**	**Morning Beverage Break**	
	Opening Remarks	Machine Learning Artificial Intelligence	Special Session: Subspecialty & Regional Society Papers, Dyke Award, Foundation of the ASNR Papers	Special Session: "Meet the Pres"	Parallel Paper Sessions	Neuroradiology Aspects of Emerging and Re-emerging Infectious Diseases	
	Advanced Imaging Techniques in Head and Neck: Current and on the Horizon		Parallel Paper Sessions			Young Professional Programming, Parallel Paper Sessions	
	Lunch Concession Stands	**Lunch Concession Stands**	**Lunch Concession Stands**	**Lunch Concession Stands**	**Lunch Concession Stands**	**Lunch Concession Stands**	**Lunch Concession Stands**
	How-To Session - TBD	**How-To Session - TBD**	**How-To Session - TBD**	**How-To Session - TBD**	**How-To Session - TBD**	**How-To Session - TBD**	
Afternoon			SNIS: Best Practices in Diagnosis of ELVO Stroke Patients (AR) (SAM)	ASSR: Spine Oncology (SAM) (AR)	ASHNR: Cased Based Approach to Head & Neck Malignancies (AR) (SAM)	Parallel Paper Sessions	
	What's New in Pediatric Neuroimaging	Neuroimaging for Functional Neurosurgery	ASSR: Vertebral Augmentation	SNIS: Healthcare Reforms Impacts on Neurointerventional Surgical Care	Young Professional Programming	ASPNR: Childhood Encephalomyelitis (AR) (SAM)	
			ASFNR: New Platforms for Functional Neuroimaging	Training Across Continuum	Evidence Based Medicine: Imaging Thyriod Nodules-What is the Evidence? How Should We Deal with It?	Session - TBD	
			Healthcare Policy Programming: Value Matters in Health Policy	SILAN Session	Parallel Paper Sessions		
					CSF/IHIWG Programming: Chiari I and Syringomyelia	CSF/IHIWG Work Group-Afternoon (Registration & Fee Required)	
	Afternoon Beverage Break	Afternoon Beverage Break	**Afternoon Beverage Break**	**Afternoon Beverage Break**	**Afternoon Beverage Break**		
	Turning Down and Dealing with the Noise	TBD Session	Advanced Imaging: MRS of 2HG	AOSNHNR Session, Parallel Paper Session	ASHNR: Delivery: Value Added Head and Neck Imaging		
	Point Counterpoint fMRI Fact, Fiction, and Future	Neuroradiology from Dusk til Dawn	Parallel Paper Sessions	Evidence Based Medicine: Speed Journal Club to Review New Evidence in Literature on Hot Topics in Neuroradiology	Parallel Paper Sessions		
			SNIS: Delivery of (ELVO) Stroke Patients-Improving Systems of Care	ASSR: Advanced Imaging: The Latest and Greatest	Pediatric Interesting Case Session (AR)		
			ASSR: The Traumatized Spine	ASFNR: Evidence Based Best Practices for Clinical Functional Imaging	Neuroradiology Education		
		Closing Reception of the Symposium - performance by Woodie and the Longboards	ASFNR: Clinical Anatomy of Functional Imaging (AR) (SAM)	Young Professional Programming (AR) (SAM)	Parallel Paper Sessions		
			Canadian Session	Parallel Paper Sessions			
			Clinical Translation of Functional and Diffusion MRI Study Group (non-CME)	Intracranial and Vessel Wall Imaging Study Group (non-CME)	Imaging Genomics Study Group (non-CME)		
			Opening Reception with Technical Exhibitors				

Schedule - ASNR 55th Annual Meeting | Diagnosis and Delivery

April 26th

Time	General Session – Grand Ballroom (Upper Level) Capacity=1627	Breakout #2 - Room 202 – (Upper Level) Capacity=350	Breakout #3- Room 103 – (Main Level) Capacity=311	Breakout #4- Room 104A – (Main Level) Capacity=292	Breakout #5- Room 104B – (Main Level) Capacity=292	Breakout #6 – Room 104C – (Main Level) Capacity=266	Breakout # 7 – Room 203AB – (Upper Level) – Capacity=225	Breakout # 8 – Turbo Talks – Room 102BC (Main Level) Capacity=195
6:00am - 8:30am	Breakfast Concession Stands							
7:15am - 7:55am	**How To Session: GE Healthcare** HTS-GE							
8:00am - 9:00am	**Wednesday Morning SAM-Vascular-Audience Response (AR) Self Assessment Module (SAM)** 16A							
9:00am - 10:30am	**ASPNR Programming: Making the Call: Abusive CNS Trauma** 17A	**Evidence Based Medicine Programming: Measuring the Quality of MIPS Quality Measurements- J. Arliss Pollock Memorial Lecture Audience Response (AR) Self Assessment Module (SAM)** 17B	**CSI Programming: Structured Reporting: Pros and Cons** 17C	**ASNR/SNMMI Programming** 17D		**ESNR Session: Imaging Biomarkers in Clinical Practice** 17F		
10:30am - 11:00am	Morning Beverage Break							
11:00am - 12:15pm	**Parallel Paper Session: Head and Neck Imaging – Can You Hear Me Now?** 18A **Moderators:** Laurie A. Loevner, MD; Gul Moonis, MD **11:00 AM - 12:20 PM** Grand Ballroom (Upper Level) 11:00 AM - 11:08 AM Imaging of Tinnitus and Sensorineural Hearing Loss: Less May Be More **Alexander Copelan M.D.** 11:08 AM - 11:16 AM MRI screening of the internal auditory canal: is gadolinium necessary to detect intrabyrinthine schwannomas? **Johnathan Valesano, MD**	**Parallel Paper Session: Pediatric Neuroradiology: Potpourri . . . a "Must See!"** 18B **Moderators:** Nicholas Stence; Kevin R. Moore, MD **11:00 AM - 12:20 PM** Room 202 (Upper Level)	**Parallel Paper Session: Imaging Points of Interest: Practical and Prescient** 18C **Moderators:** Christopher P. Wood, MD; Rivka R. Colen, MD **11:00 AM - 12:15 PM** Room 103 (Main Level)	**Parallel Paper Session: Brain Tumor Imaging: Here and On the Horizon** 18D **Moderators:** Angela Lignelli, MD; Thomas C Booth, MBBS, PhD **11:00 AM - 12:15 PM** Room 104A (Main Lobby)	**Parallel Paper Session: Excerpta: Adult Brain Topics: "Real and Rare" . . . Really?** 18E **Moderators:** Sana Ali, MD; Peter H.B. McCreight, MD, FACR **11:00 AM - 12:20 PM** Room 104B (Main Lobby) 12:16 PM - 12:20 PM Multiple Peripheral Fusiform Cerebral Aneurysms from Atrial Myxoma: Diagnostic Imaging and Interventional Management **Ali Malik, M.D.** 11:00 AM - 11:04 AM CNS Involvement in Hypereosinophilic Syndrome **Rachel L. Delfanti, M.D.**	**Parallel Paper Session: TBI: Understanding "Undone"** 18F **Moderators:** Greg Zaharchuk, MD, PhD; Michel Bilello, MD, PhD **11:00 AM - 12:15 PM** Room 104C (Main Lobby) 11:00 AM - 11:08 AM Distribution of Subarachnoid Hemorrhage as a Predictor of Diffuse Axonal Injury **David Li** 11:08 AM - 11:16 AM Prevalence of Microhemorrhages Following Blast-Related Mild Traumatic Brain Injury in Military Service Members Using Susceptibility-weighted MRI **Christopher Morley**	**Parallel Paper Session: "Seizing" Opportunity** 18G **Moderators:** Noriko Salamon, MD, PhD; Ramin Saket, MD **11:00 AM - 12:20 PM** Room 203AB (Upper Level)	**Parallel Paper Session: TURBO & TOUR: Advanced Imaging: Now and Next** 18H **Moderators:** Kirk M. Welker, MD; Mohit Maheshwari, MD **11:00 AM - 12:1 PM** Room 102BC (Mair Level)

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	11:16 AM - 11:24 AM Diagnostic Utility of Compressed Sensing SPACE for IAC MRI Screening Protocols **Mikell Yuhasz, MD**	11:00 AM - 11:08 AM Improved Fat Suppression Homogeneity with 2D IDEAL Turbo Spin Echo in Pediatric Spine Imaging at 3 Tesla **Cory Pfeifer**	11:00 AM - 11:08 AM Initial Clinical Experience Utilizing a Accelerated Velocity Selective Arterial Spin Labeling for Non-Contrast 3D MR Angiography in Complex Geometries **Prateek Sanan**	11:00 AM - 11:08 AM Machine learning algorithms for predicting GBM growth patterns using advanced and delayed-contrast MRI: feasibility demonstration **Yael Mardor**	11:04 AM - 11:08 AM Multimodality Imaging of Cavernous Sinus Meningioma – Clinical imaging characteristics and literature review of a very rare entity **Vasant Garg**	11:16 AM - 11:24 AM SWI Patterns of Cerebral Bleeding in Patients with Diffuse Axonal Injury: Correlation with GCS at Admission **Andres Rodriguez**	11:00 AM - 11:08 AM Quantitative assessment of interictal hippocampal signal alteration in temporal lobe epilepsy patients with unilateral mesial temporal sclerosis. **Kiran M Sargar 4715179 , MD**	11:00 AM - 11:03 AM Transient Cerebral Ischemic Hypobaric Exposure to 25,000 Ft During Routin Aircrew Training? MR Evaluation of High Altitude Exposure Upo the Brain **Jeremy M Bernot, M.D.**
	11:24 AM - 11:32 AM Correlation of Quantitative Analysis on FLAIR and enhanced FLAIR with Auditory Test in Sudden Hearing Loss **Eun Soo Kim**	11:08 AM - 11:16 AM The Diagnostic Utility of Isotropic Balanced Steady State Free Precession Imaging (bSSFP) Sequence For the Evaluation of Spinal Drop Metastases **Karen Buch**	11:08 AM - 11:16 AM Assessment of Extracranial-Intracranial Bypass by 3D ASL-based Non-contrast MRDSA **Kazuhiro Tsuchiya, MD**	11:08 AM - 11:16 AM Comparison Study of Radiogenomics Association and Prognostic Value Between MR Dynamic Susceptibility Contrast Perfusion Weighted Imaging and Diffusion Imaging in Patients with Newly Diagnosed Glioblastoma **Xiang Liu, MD,Ph.D**	11:12 AM - 11:16 AM Beta-Amyloid Angiitis: An Atypical Radiographic Appearance **Tee Yin Tracy Teo, MsEDU MBA DO**	11:24 AM - 11:32 AM Perfusion Deficits Identified in Blast-TBI Subjects **Jalal B Andre, M.D.**	11:08 AM - 11:16 AM Determination of Hippocampal Epileptogenicity on the basis of Alteration of Clinical 3T MR Microarchitecture alone in the Absence of Volume or Signal Change **Vivek Gupta, MD**	11:03 AM - 11:06 AM FNCI directed Assessment o NeuroVascula Uncoupling in Concussion Patients **Dr. E. Bruce McIff, MD, FACR, FSIR**
	11:48 AM - 11:56 AM Evaluation of the Cochlear R2 angle and Depth on 3D T2 Weighted Images of the Temporal Bone in Children without Sensorineural Hearing Loss: A Potential Tool for the Diagnosis of Scala Communis **Timothy N Booth, MD**	11:16 AM - 11:24 AM Reduced FOV Diffusion Tensor Imaging and Fiber Tractography of the Pediatric Cervical and Thoracic Spinal Cord Injury **Mahdi Alizadeh**	11:16 AM - 11:24 AM TRANCE (TRiggered Angiography Non Contrast Enhanced) MRI of the Intracranial Vasculature at 3 Tesla: Preliminary Experience in Children **Jeffrey H. Miller, MD**	11:16 AM - 11:24 AM Investigating Dynamic Susceptibility weighted Contrast enhanced (DSC) Perfusion MR Imaging in Posterior Fossa Tumors: Differences and Similarities with Supratentorial Tumors. **Matia Martucci, MD**	11:16 AM - 11:20 AM Varicella Zoster Virus Meningoencephalitis **Arbab Iqbal**	11:32 AM - 11:40 AM Resting Cerebral Perfusion Deficits and Relation To Cognitive Outcomes in Chronic Traumatic Brain Injury **Jeffrey B. Ware**	11:16 AM - 11:24 AM Amygdala and Hippocampal Enlargement in Temporal Lobe Epilepsy **Aristides A Capizzano, MD**	11:06 AM - 11:09 AM Effects of Sports-Relate Head Impact Exposure on Cerebral Bloc Flow in Deep Gray Nuclei **Yvonne Nguyen 6751906**
	11:56 AM - 12:04 PM Evaluation of Mid-aperture Measurement of the Endolymphatic Duct on MRI in Children without Sensorineural Hearing Loss with CT Comparison. **Timothy N Booth, MD**	11:24 AM - 11:32 AM Developing Imaging Pulse Sequences for Miniature Swine Traumatic Spinal Cord Injury Model **Dheeraj Muddasani, M.D.**	11:24 AM - 11:32 AM Ultrafast High-Spatial Resolution MR Angiography of the Head Using Differential Subsampling with Cartesian Ordering (DISCO) **James Drummond, MBBS**	11:24 AM - 11:32 AM Predicting Genomic Features of Lower Grade Gliomas with Diffusion and Signal Intensity Based Compartmentalization to Account for Tumor Heterogeneity **Scott N Hwang, PhD, MD**	11:20 AM - 11:24 AM Early Hemodynamic Response Assessment of Stereotactic Radiosurgery for a Cerebral Arteriovenous Malformation using 4D Flow MRI **Charles Qingchuan Li, MD**	11:40 AM - 11:48 AM Hyperbaric Oxygen Therapy Can Induce Angiogenesis and Regeneration of Nerve Fibers in Traumatic Brain Injury Patients **Sigal Tal, DR**	11:24 AM - 11:32 AM Signal changes of the temporal pole can be seen in non mesial temporal lobe epilepsy **Emiko Morimoto, MD,PhD**	11:09 AM - 11:12 AM Occupational Hazards of Flying Pigs: A Swine Model for Hypobaric Induced Neuronal Inju **Mariya Gusman, MD**
		11:32 AM - 11:40 AM Connectome Mapping with Edge Density Imaging Separates Persons with Pediatric Mild Traumatic Brain Injury from Controls **Cyrus A Raji, MD**	11:32 AM - 11:40 AM High Resolution Velocity Encoded PC-MRA (4D Flow): Image Quality Comparison with 3D Time of Flight MRA **Warren Chang, MD, MBA**	11:32 AM - 11:40 AM Quantitative multimodal MRI improves the predictive power of survival models for glioblastoma patients **Josep Puig**	11:24 AM - 11:28 AM Computed Tomographic Angiography of the Head in Extracorporeal Membrane Oxygenation **Jay Acharya**	11:48 AM - 11:56 AM Subconcussive Impacts in High School Football Alter MEG Measured Default Mode Network **Elizabeth Davenport, PhD**	11:32 AM - 11:40 AM Subcortical linear high intensity in the temporal pole is related with mesial temporal lobe epilepsy **Emiko Morimoto, MD,PhD**	11:12 AM - 11:15 AM MRI in Mesial Temporal Lob Epilepsy – is Hippocampal Astrogliosis a Distinct Entity **Elke Hattinge Professor**
		11:40 AM - 11:48 AM Normal Basion-Cartilaginous Dens Interval (BCDI) in Children **Achint Singh, MD**	11:40 AM - 11:48 AM Imaging Characteristics Associated with Clinical Outcomes in Posterior Reversible Encephalopathy Syndrome **Andrew D Schweitzer 6297306**		11:28 AM - 11:32 AM TEMPI Syndrome Case with Multiple Neurological Findings (Telangiectasias, Elevated erythropoietin level and Erythrocytosis, Monoclonal gammopathy, Perinephric-fluid collections, and Intrapulmonary shunting) **Samuel B Bergamaschi, MD**		11:40 AM - 11:48 AM Hybrid [(18) FDG] - PET/MRI in patients with temporal lobe epilepsy **Cornelius Deuschl**	11:15 AM - 11:18 AM The Role of MRI in Therm Laser Ablatio for Epilepsy **Nadja Kadom MD**
		11:48 AM - 11:56 AM MRI markers of degenerative disc disease in a population of young patients with Multiple Sclerosis **Rafael Glikstein**					11:48 AM - 11:56 AM Laterality of Anterior Temporal Lobe Glucose Metabolism in Extra Temporal Focal Cortial Dysplasia. **Hajime Yokota, MD, Ph.D**	11:18 AM - 11:21 AM Imaging temporal Lob Epilepsy: Beyond the Hippocampus **Joseph Whitlock, MD**

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	12:04 PM - 12:12 PM Volume of Acoustic Neuromas Using "Ice Cream Cone" Method Compared with the ABC/2 Formula and the Planimetry Method **Hsing-Hao Ho MD** 12:12 PM - 12:20 PM Tumor Volumes in Vestibular Schwannomas: Do the ABC/2 Method and 3D Planimetric Method Correlate? **GIRISH BATHLA, MBBS, DMRD, FRCR, MMeD**	11:56 AM - 12:04 PM Why Do Intracranial Germ Cell Tumors Arise in the Pineal Region? A Preliminary Hypothesis **John H. Rees, MD** 12:04 PM - 12:12 PM The Incidence of Pituitary Cysts in Children may be Underreported **James F Haigney, BS** 12:12 PM - 12:20 PM Implications of Regional TSC1 Gene Expression on Cerebellar Development and Behavioral Abnormalities in Patients with Tuberous Sclerosis Complex **Yi Li, MD**	11:48 AM - 11:56 AM Exploring atypical PRES – Breakout or typical? **Andrew Charles McClelland** 11:56 AM - 12:04 PM Application of Deep Learning in Neuroradiology: Automated Detection of Basal Ganglia Hemorrhage **Vishal Desai, MD** 12:04 PM - 12:12 PM Automated Diagnosis of Basal Ganglia Diseases Using a Customized Image-Processing Pipeline Coupled with Bayesian Networks **Jeffrey David Rudie, MD PhD**	11:40 AM - 11:48 AM Sodium Imaging and Gliomas **Lucidio Portella Nunes Neto , MD** 11:48 AM - 11:56 AM Early Tumor Growth Between Initial Resection and Radiotherapy of Glioblastoma: Incidence and Impact on Clinical Outcomes **Javier Villanueva-Meyer** 11:56 AM - 12:04 PM Longitudinal Relationship Between DWI and DTI Parameters in Glioblastoma Following Treatment **Kofi-Buaku Atsina, MD** 12:04 PM - 12:12 PM Diagnostic Accuracy of Centrally Restricted Diffusion in the Differentiation of Radiation Necrosis from Tumor Recurrence in High Grade Gliomas **Nader Zakhari Dr**	11:32 AM - 11:36 AM Cavernous Sinus Hemangioma: A Case Report **Maximilian Cho, M.D.** 11:36 AM - 11:40 AM A Rare Presentation of Cerebral Proliferative Angiopathy with Subarachnoid Hemorrhage. **Matthew Christopher Bean, MD/PGY2** 11:40 AM - 11:44 AM Brainstem Venous Congestion from Craniocervical Junction Dural AV Fistula: A Rare Cause of Brainstem Dysfunction **Young Park, MD** 11:44 AM - 11:48 AM A Dissecting Posterior Cerebral Artery Aneurysm Mimicking a Pineal Mass and Causing Obstructive Hydrocephalus. **Pattana Wangaryattawanich, MD** 11:48 AM - 11:52 AM Reversible Cerebral Vasoconstriction; an underdiagnosed entity for thunderclap headaches. **Rafay Ahmed** 11:52 AM - 11:56 AM Vessel Wall Enhancement in Delayed-Onset Intracranial Herpes Zoster Vasculitis **Yun Sean Xie, MD**	11:56 AM - 12:04 PM Decreased Hippocampus and Amygdala Volumes in Patients with Traumatic Brain Injury Are Associated with Decreased Post-traumatic Stress Disorder Resilience **Siddhartha Kosaraju** 12:04 PM - 12:12 PM Near term decrease in brain volume following mTBI is detectible in the context of pre-injury stability **Adam Goldman-Yassen**	11:56 AM - 12:04 PM Language Network Plasticity in Cortical and Subcortical Temporal Lobe Epilepsy Patients Undergoing Surgery Results from a Clinical fMRI-study **Olivia Foesleitner** 12:04 PM - 12:12 PM Semi-Automated Stereo-Electroencephalography Electrode Localization **Richard Gorniak, M.D.** 12:12 PM - 12:20 PM FLAIR Fusion in Multiple Sclerosis Follow up : an Unavoidable Tool for Private Practice **Stéphane Cantin, MD**	11:21 AM - 11:24 AM Chorda Tympani and Cranial Nerve Involvement in CIDP **Marin Alisa McDonald, MD/PhD** 11:24 AM - 11:27 AM Neuroimaging Manifestations of Hematologic Malignancies A Compartment Approach **Krystal C Buchanan, M** 11:27 AM - 11:30 AM Multicenter Study on the Prognostic Utility of Diffusion Weighted Imaging in Patients with Brain Metastases **Yin Jie Chen, MD** 11:33 AM - 11:36 AM Analyzing Imaging Manifestations of Neurosarcoid A Retrospecti review **Allan Wang, MD** 11:36 AM - 11:39 AM Management and treatment of headaches based on neuroradiolog findings **Mohamad Goldust**

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					11:56 AM - 12:00 PM Multiple Brain Arteriovenous Malformations (AVMs) associated with Multiple Focal Nodular Hyperplasia (FNH) of the liver: A Rare Syndrome **Paulo Puac MD , MD** 12:00 PM - 12:04 PM Multifocal Progressive Intracerebral "Aggregomas": Novel Clinical, Imaging and Pathologic Findings **Sonya Khan** 12:04 PM - 12:08 PM Melanotic Schwannoma: A Rare Cause of Accessory Nerve Palsy **Laura Elizabeth Nash, MBChB, BSc (Hons)** 12:08 PM - 12:12 PM Extraventricular Subependymoma Of The Cerebellopontine Angle In An Adult Patient **Matthew Joseph Sondag** 12:12 PM - 12:16 PM Calcifying Pseudoneoplasm of the Neuraxis (CAPNON) Involving the Central Skull Base: Uncommon Location for an Uncommon Lesion **Marinos Kontzialis**			
10:30am - 1:30pm	Lunch Concession Stands							
12:30pm - 1:15pm	**How To Session: Toshiba Medical** HTS-Toshiba Medical							
12:30pm - 1:30pm	**How To Session: Toshiba Medical** HTS-Toshiba Medical							
1:30pm - 3:00pm	**ASHNR Programming: Diagnosis: Cased Based Approach to Head & Neck Maligancies Audience Response (AR) Self Assessment Module (SAM)** 19A		**Evidence Based Medicine Programming: Incidental Findings in Neuroradiology- What is the Evidence? How Should We Deal with It?** 19C	**Parallel Paper Session: Pediatric Neuroradiology: Clinical Development and Imaging Developments** 19D	**CSF/IHIWG (International Hydrocephalus Imaging Work Group) Programming: Chiari I and Syringomyelia** 19E	**Parallel Paper Session: Spine Imaging: Pain and Procedures** 19F	**Parallel Paper Session: Neuroimaging Clues, Reviews, and News to Use** 19G	**Parallel Paper Session: Gd, Gd Everywhere . . . . . .Cause for Pause, and Think!** 19H

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3:00pm - 3:30pm	Afternoon Beverage Break							
3:30pm - 4:45pm	**ASHNR Programming: Delivery: Value Added Head and Neck Imaging** 20A	**Parallel Paper Session: Fetal and Pediatric Imaging Feats: Way to Grow!** 20B	**Parallel Paper Session: Imaging of Cognitive Impairment - Not in the Know?** 20C	**Parallel Paper Session: Imaging of MS - White Matter Matters!** 20D	**Parallel Paper Session: Imaging of Headache, Across the Pressure Spectrum** 20E	**Parallel Paper Session: Excerpta: Pediatric Problems...Can you Solve Them?** 20F	**Parallel Paper Session: Aneurysms: Search and Destroy Mission - to Find, Fix and Follow** 20G	**Parallel Paper Session: Mixture of Interest** 20H
5:00pm - 6:30pm	**Pediatric Interesting Case Session (AR) Audience Response** 21A	**Neuroradiology Education** 21B	**Parallel Paper Session: Cancer of the Head and Neck: Reality Check - from the Rare to the Response** 21C	**Parallel Paper Session: Aneurysm Treatment - Conversion to Diversion...When and Why?** 21D	**Parallel Paper Session: Cost-Effective Imaging in the Era of the Triple Aim** 21E	**Study Group: Imaging Genomics (Non-CME)** 21F	**Parallel Paper Session: More Aneurysm Management: Dealing with the Unruptured and Unknown** 21G	**Parallel Paper Session: Dissection Collection and CTA Today** 21H