



Professor Zain Alabedeen Jamjoom



(يَا أَيُّهَا النَّفْسُ الْمُطْمَئِنَّةُ * ارْجِعِي إِلَىٰ رَبِّكِ رَاضِيَةً مَّرْضِيَّةً * فَادْخُلِي فِي عِبَادِي * وَادْخُلِي جَنَّاتِي)
تتقدم الجمعية السعودية لجراحة المخ والأعصاب بخالص العزاء وعظيم المواساة في وفاة الأستاذ الدكتور زين
العابدين جمجوم (رحمة الله عليه) وبهذا المصاب الجلل نتقدم بخالص التعازي القلبية لأسرته الكريمة وكافة آل
جمجوم والمقربين، سائلين المولى عز وجل أن يتغمده بواسع رحمته ويسكنه فسيح جناته ويلهم أهله وذويه
الصبر والسلوان.

We are deeply saddened by the news of Professor Zain Alabedeen Jamjoom who passed away on 17-10-2022. Our sincere condolence as a society to his family, friends, and neurosurgery community in Saudi Arabia

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Issue's Message

Here is the latest issue of the SANS newsletter! It is with great sadness and heavy hearts that we have learnt of the passing of Professor Zain Alabedeen Jamjoom. Our deepest condolences to the family, may Allah bless and comfort them in this time of sorrow.

In the next few pages, Prof. Amro Al-Habib and Dr. Abdulrahman Sabbagh will take you on a beautiful journey and portray Prof. Zain as a virtuous leader

Neurosurgery in Saudi Arabia includes an article on regional differences in the neurosurgery workforce in Saudi Arabia.

In this issue, you will also read a candid interview with Dr. Mahmoud Al Yamany. We are grateful that he took some time to answer some questions about neurosurgery and the profession in general

We would like to thank our regular contributor Dr. Mohammed Bafaquh for providing us with clinical challenges.

As always, the newsletter covers current and upcoming activities and events from SANS, as well as selected news from our local neurosurgery community.

We welcome your contributions, feedback, and suggestions to further improve our newsletter. Please click [**HERE**](#) to contact us and share your contribution.



We are glad to announce that SANS Newsletter will issue Certificates of Contributions for residents. The final decision on what gets published and who earns a certificate is with the editorial board members.



OBITUARY

Professor Zain Alabedeen Jamjoom: The Saudi Association of Neurological Surgery has lost one of its pillars. We have lost a member of our family



By Prof. Amro Al-Habib

King Saud University | KCUH
Riyadh

It is with great sadness that we experience and write about the loss of Professor Zain Alabedeen Jamjoom. As one of his former students and young colleagues, I had the privilege and good fortune to learn from the master of neurosurgery. He was the living example of perfect neurosurgery, in every little detail: elegance, commitment, discipline, attention to detail, exceptional sense of fairness, perseverance, respect, and endless dedication. He had the pride of being "the master of his craft" and occasionally even limited patience to none-sense and foolish actions. Professor Zain Alabedeen Jamjoom respected working people and had great admiration for those who wanted to learn or showed courage to

improve. He enjoyed his specialty in every way: clinical work, surgeries, research, and teaching. I remember him standing for long hours at a stretch and discussing various scientific topics like a novice. His commitment to his patients was clearly seen in their faces. They loved him and were thrilled to see him. We will miss him greatly, even though his teaching and dedicated attitude remain like a bright light in the darkness to remind us of who we really are and to show us the way through difficulties. Our sympathies go out to his family and students. May Allah bless his soul and grant him forgiveness and mercy. Verily, we belong to Allah, and verily, to Him we will return.

Professor Zain Alabedeen Jamjoom



Image 1. When I visited professor Zain Alabedeen Jamjoom in his office at King Faisal Specialist Hospital and Research Centre, Jeddah (April, 2016)



Image 2. Professor Zain Alabedeen Jamjoom performed the first case (brain tumour) in the Neurosurgery MRI-suite at King Saud University Medical City on 24th January 2018

From Left to Right: Dr. Maher Hassounah, Professor Zain Alabedeen Jamjoom, Dr. Ashwag Alqurashi, and Dr. Abdulrazag Ajlan



Images 3 &4: Professor Zain Alabedeen Jamjoom during hands-on cadaver courses in the surgical skill centre (College of Medicine, King Saud University).



OBITUARY

ZAIN ALABEDEEN BAKUR JAMJOOM: One Of The Greatest Health Professional Role Models Of Our Time. The Founder Of The Saudi Association Of Neurological Surgeons

By Dr. Abdulrahman Jafar Sabbagh
King Abdulaziz University Hospital | KAUH
Jeddah, Saudi Arabia



On October 17, 2022, I had just positioned a patient and finalising the neuronavigation registration for a complex late afternoon case when I saw my friend Dr. Khalid Siddiqui's name appear on my phone when it rang. I was focused on my case and was not ready for any calls. Still, something told me I had to pick up. He shocked me with the sad news about Professor Zain Alabedeen Jamjoom. My legs could no longer support me, so I sat down. A flood of memories washed over me: we were supposed to meet a few weeks ago, but had to postpone it because he had contracted COVID-19 and had to be isolated until he recovered. Little did I know that he had been unable to attend his chemotherapy sessions due to the quarantine, which led to a rapid progression of his disease and eventually to his demise.

I had the honour of working with him as a colleague at King Faisal Specialist Hospital from 2015-2016. I remember how much I admired that he was always the first to arrive at the neuroscience ward at 7:29am sharp, even though he was the most senior among us. His rounds were very memorable: he was energetic, enthusiastic, and excited to meeting his patients in the morning. He walked with a militaristic march and led us up and down the stairs when we had to go back and forth

between the floor and the ER. He always greeted patients with a gentle yet firm smile: he was the type of doctor who filled his patients with confidence and optimism in a paternalistic way, speaking to them in clear, concise language that made it easy for them to understand even the most complex circumstances. He would say

{أخي الفاضل، سأتكلم بالعربي الفصيح أرجوك اسمع زين}

which means "Dear Sir, I will speak in clear Arabic, please listen carefully", then he would explain and educate his patients precisely and very clearly.

He never shied away from discussing difficult scenarios or complications. Rather, he made sure patients understood the potential risks and benefits of any procedure, no matter how difficult or safe it was considered.

{هذه عملية مأمونة و ليست مضمونة}

"Hadi amalial ma'moona, wa laysat madmoona"

(English: this surgery is considered safe, but it is not guaranteed), is what he would tell his patients before they consented to surgery.

Professor Zain Alabedeen Jamjoom

Even during his relentless battle with cancer, he continued to care for his patients. Describing how he cared for his patients between chemotherapy made Dr. Rothaina Jamal, his former senior resident, burst into tears. For her, and for many other colleagues and trainees, this will always be one of the most awe-inspiring memories. What was even more difficult for her to describe was how, even though he developed a concerning skin condition as a complication of chemotherapy, he continued to perform surgeries that required him to painstakingly scrub his ailing hands and forearms in preparation for surgery and then rub his hands with sterile antibiotic ointments before putting on his surgical gloves. His patients felt his true dedication to helping them, especially during this difficult time, and appreciated it. Some even tweeted about it (Figure 2) (1).

Zain Alabedeen Bakur Jamjoom was born in March 1952 (Rajab of the year 1371 Hijri) in Jeddah, Saudi Arabia. He excelled in all phases of his education and was always interested in science and publications. He attended the prestigious Al-Thaghr School in Jeddah (مدارس الثغر النموذجية بجدة), where he used to publish articles in the school's journal. One of these publications was an interesting translation into Arabic of a scientific article on the discovery of genetics in 1969 (Figure 3). Extraordinarily, he was ranked second in the country when he graduated from school (2). He moved to Riyadh to become one of the very few selected from around the country to be among the first batch of medical students at King Saud University. However, after two years, he managed to move to a German medical school and later received a scholarship to study at the world renowned University of Tübingen in Germany, graduating in 1977.

The university of Tübingen is known for its exceptional research facilities and academic publications, which is reflected in its alumni, including the late Professor.

After graduating and completing his residency in neurosurgery at the University Hospital Essen in 1984. Prof. Jamjoom became an assistant professor at King Saud university in 1985. There, he published over a hundred peer-reviewed articles that contributed to a large spectrum of medical specialties. As a resident, he published his first peer-reviewed article in an international journal in 1982. It was about extracranial-intracranial bypass (3).

Almost 40 years later, in 2021, he published his last article on Attrition and success rates in the Saudi Board of Neurosurgery (4). His most cited article was a prospective, randomised, double-blind, placebo-controlled study of the efficacy and safety of a prophylactic high dose of tranexamic acid in spine surgery (5). Professor Jamjoom has repeatedly teamed up with his younger brother Professor Abdulhakeem Jamjoom and published many articles together. Professor Jamjoom has been cited over seventeen hundred times.

His passion for education inspired him to translate several books - mainly on spine surgery - from English into Arabic to make them more accessible to Arabic speakers. Dr. Jamjoom worked at King Saud University between 1985 to 2015 and at Security Forces Hospital from 1991 to 1996. Between 1996 and 2015, he worked as a part-time consultant neurosurgeon at Dallah Hospital. He later returned to Jeddah and worked at the prestigious King Faisal Specialist Hospital, Jeddah Branch from 2015 to 2020. There, I was fortunate to work as his colleague and take every opportunity to attend rounds with him and join him in difficult cases.

Professor Zain Alabedeen Jamjoom

His caring and kind personality was not only reserved for patients, but he constantly offered his help to all his colleagues and students who needed it. One of his earliest residents, Dr. Mohammad Al-Wehaibi, told me one such story.

In 1987, Al-Wehaibi had been attempting to start his residency in Germany, and the late professor went above and beyond in helping him through the process. He wrote letters on his behalf to his professors in Germany to help Al-Wehaibi get accepted, and gladly sacrificed his own time and effort to help a colleague in need. When Al-Wehaibi was accepted and began his residency in Germany, Prof. Jamjoom sent him a heartfelt letter to follow up on his training. Al-Wehaibi told me that upon reading the letter, his own father said, "I never expected that even I would write such a compassionate and caring letter to you, even if you are my own son and one of his students."

From the beginning of his career in Riyadh, Prof. Jamjoom had been passionate about creating training opportunities in Saudi Arabia. He was waiting for the right time to turn that passion into action. The first neurosurgical program was developed at King Faisal University in the Eastern Province. Although it was not involved in the original process, he worked tirelessly with Prof. Ahmad Ammar, Prof. Kanaan, and Prof. Sugeira to guide and refine the program and its curriculum after the Saudi Board in Neurosurgery was established by the Saudi Commission for Health Sciences. Professor Jamjoom was appointed as the first chairman of the Saudi council for Neurosurgical training. I had the honour of being one of his late successors in 2016.

He was truly one of the most honest people I have met in my entire career. He never beat around the bush in most aspects of his daily

life. Dr. Jamjoom enjoyed teaching and had a real passion for it. This was especially evident when he taught his residents and students, especially when he taught surgical skills in the operating rooms and cadaver labs.

After rounds, the generous Prof. Jamjoom would take us to Joffrey's Coffee on the first floor every Thursday during our time at the King Faisal Specialist Hospital and Research Centre, Jeddah, and buy coffee for the entire team, including students, interns, residents, specialists, and consultants (Figure 4).

Prof. Zain Alabedeen Jamjoom married his loving wife, Mrs. Zahra Alsultan, and they were blessed with four gifted children who followed in their father's footsteps: Dima, a consultant neuroradiologist, Mohammed, who is currently finishing his training as a general surgeon and will soon take the boards, Faris, a consultant dentist; and Hasan, who specialises in endocrinology.

Interestingly, his nephew Aymun, the son of his brother Prof. Abdulhakeem Jamjoom, took on the same specialty of neurosurgery as his career aspiration.

The late professor was a rare example of a doctor who put his patients above everything else: even himself and his own health. He is truly one of the greatest role models of our time for neurosurgeons, doctors, and non-medical professionals alike. He was a living legend who will now live on in our hearts and the hearts of his family, colleagues, students, and patients, as well as in his articles and books for generations to come.

Professor Zain Alabedeen Jamjoom

On Wednesday, September 7, at 10:38 p.m., my beloved Prof. Zain sent me his last message in response to my prayer for him to be cured of his new diagnosis of Covid19 infection and that we will meet as soon as he recovers. He said in Arabic, which translates to, "Thank you, may Allah reward you well... God willing, I will see you soon under good circumstances". His last words to me were a kind prayer and a good wish (Figure 5).

When the history of modern medicine is

written in our part of the world, his pages will be among the brightest.

Acknowledgments

I would like to thank Professor Abdulhakeem Jamjoom, Dr. Dima Jamjoom, Dr. Mohammad Awehaibi, Dr. Mohammed Abdeen, and Dr. Rothaina Jamal for their valuable information. I would also like to thank Ms. Emy Lou Guillet for preparation and Ms. Fatmah Ahmad Sabbagh for proofreading and correcting the article.



Figure 1

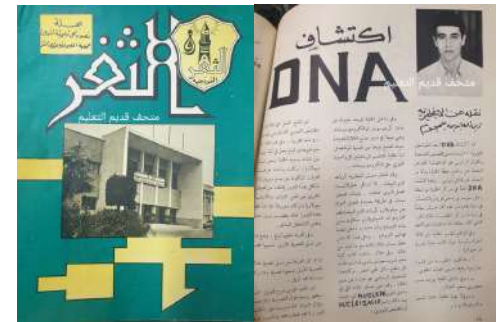


Figure 3



Figure 2



Figure 4

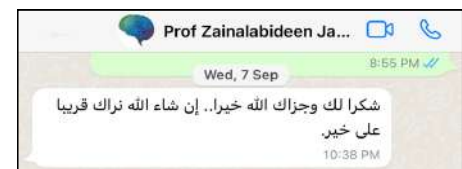


Figure 5

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OBITUARY

ZAIN ALABEDEEN JAMJOOM (1952–2022)

WORLD NEUROSURGERY

VOLUME 169, JANUARY 2023, PAGE 31



By Dr. Aimun A.B.Jamjoom & Prof. Abdulhakim B.Jamjoom

It is with great sadness that we share the news of the passing of our uncle and brother, Professor Zain Alabedeen Jamjoom on October 17, 2022. Over a 40-year career, Professor Jamjoom played an instrumental role in advancing neurosurgery in Saudi Arabia. Having received a scholarship to study abroad in Germany, he graduated from the University of Tübingen and went on to complete his neurosurgical training at University Hospital Essen. After being awarded Facharzt (independent specialist in neurosurgery) in 1984, he returned to Saudi Arabia, where he played a leading role in the development of the neurosurgical services in Riyadh (King Khalid University Hospital, Securities Forces Hospital, and Dallah Hospital) and Jeddah (King Faisal Specialist Hospital and Research Centre). A meticulous and thoughtful surgeon, he performed thousands of procedures

and cared for countless patients over his career. He was an adept clinical scientist, publishing more than a hundred research articles and becoming the first Saudi Professor of Neurosurgery. He had a vital role in training generations of Saudi neurosurgeons and contributed significantly to the establishment of the Saudi Neurosurgical Board Training Program. He also took on important administrative positions and was the founding president of the Saudi Association of Neurological Surgeons, which he led for 6 years. A man of many talents, he was an intellectual, a skilled artist, and a linguist. He spoke 3 languages fluently and translated several neurosurgical textbooks into Arabic. He leaves behind a loving wife, 4 children, and an indelible mark on a thriving Saudi neurosurgical community.



OBITUARY

Several obituaries for Professor Zain Alabedenn Jamjoom portrayed him as virtuous leader





OBITUARY



Ahmed Ammar @AhmedAm16912744 · 18 Oct

Replying to @ajsabbagh

اللهم ارحمه واغفر له واسكنه فسيح جناته.. سيظل الدكتور زين العابدين جمجوم علامة فارقة في تطور جراحة المخ والأعصاب في المملكة.. جزاءه الله كل خير واسكنه الفردوس الأعلى



Waleed Khoja · 18 Oct

رحمه الله وغفر له واسكنه فسيح جناته.. عرف عن الأستاذ الدكتور زين العابدين جمجوم دماثة الخلق والانسامة وحبه للعلم..

ونتقدم بخالص العزاء لجميع افراد عائلته الكريمة واسأل الله لهم الصبر والسلوان.. انا لله وانا اليه راجعون



Ashwag Alqurashi | د. أشواق القرشي @showog00 · 18 Oct

رحم الله أستاذنا ومعلمنا بروف زين العابدين جمجوم رحمة توسع السماوات والأرض وجزاه الله عتاً وعن مرضاه خير الجزاء

اللهم إنه في نمتك وحبل جوارك فقه فتنة القبر وعذاب النار وانت أهل الوفاء والحمد اللهم فاغفر له وارحمه إنك أنت الغفور الرحيم



sherif elwatidy @sherifwatidy · 20 Oct

Replying to @SansMed and @YazidMaghrabi

بروفسور زين العابدين جمجوم مؤسس جراحة الأعصاب بجامعة الملك سعود وأحد أعمدة جراحة الأعصاب بالوطن العربي

تعلما من بروفسور زين الانكزام والدقة والاخلاص والتفاني في العمل والامانة مع المرضى ربنا يجعل ما قدمه في موازن حسناته ويغفر له ويجعله في الفردوس من الجنة



ELThursday · 17 Oct

إنا لله وإنا إليه راجعون..

يوم حزين في تاريخ جراحة المخ والأعصاب

رحم الله أستاذنا ومعلمنا د. زين العابدين جمجوم أسأل الله ان يجبر قلوب اهله ومحبيه.



alibinmohammed5 · 17 Oct

إنا لله وإنا إليه راجعون
انتقل الى رحمه الله تعالى استاذي بروف/ زين العابدين جمجوم

اللهم اغفر له وارحمه واكرم نذله ووسع منخله واغسله بالماء والثلج والبرد ونقه من الذنوب والخطايا كما ينقى الثوب الأبيض من الدنس، اللهم جزاه بالחסنات إحسانا وبالسينات عفواً وغفرانا.



Mahmoud AlYamany د. محمود اليماني @DR_M_YAMANY · 19 Oct

رحم الله اخونا و أستاذنا و قدوتنا الأستاذ الدكتور زين العابدين جمجوم و اسكنه فسيح الجنان و الهما جميعا الصبر و السلوان على فقده.



Khaled Abdulshafi @khaledneurosx · 17 Oct

رحم الله المعلم والمربي وقوة جراحات المخ والأعصاب الدكتور زين العابدين جمجوم.
اللهم تغمده بواسع رحمته وانزل على اهله ومحبيه الصبر والسلوان.



Yasser orz @YasserOrz · 18 Oct

الأستاذ الدكتور زين العابدين جمجوم في نمة الله رحمة الله عليه ورزقه الجنة وإنا لله وانا اليه راجعون الله يرحمه ويتغمده بواسع رحمته
الله اللهم اهله الصبر والسلوان

3

2

7



Othman Alhammad د. عثمان الحماد @OthmanAlhammad6 · 17 Oct

توفي اليوم أحد أعلام ورواد جراحة الأعصاب في المملكة، الفقيه بروف (زين العابدين جمجوم) له إبداء بيضاء على كل ممارس لجراحة الأعصاب في بلدنا. الله تقبله عندك وارفع منزلته واجعل عمله شفيها له.
إنا لله وإنا إليه راجعون. #السعودية

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25

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DrHaniAljohani · 18 Oct

توفي البارحة،

علم من أعلام جراحة المخ والأعصاب في المملكة العربية السعودية وفي العالم العربي

الأستاذ الدكتور/ زين العابدين جمجوم

رحمه الله وأسكنه فسيح جنته، ورفع درجته في المهنين

وجعل مقامه من علم نافع وعمل صالح حجة له عند ربه



Maria Al Zahrani @dr_Maria_ · 18 Oct

Replying to @SansMed

رحم الله زميل المهنة الدكتور زين العابدين جمجوم وغفر له له وأسكنه الفردوس الأعلى من الجنة واجعل مقامه من خدمة للمرضى شفيها له. {إنا لله وإنا إليه راجعون }



Drkhenazian · 18 Oct

رحم الله الأستاذ الدكتور زين العابدين جمجوم أستاذ ومؤسس جراحة المخ والأعصاب في المملكة درسنا في كلية الطب فكان خير معلم

اللهم جزاه عنا خيرا وارحمه واغفر له وارفع درجته والله اهله الصبر والسلوان





OBITUARY



بسم الله الرحمن الرحيم
((يَا أَيُّهَا النَّفْسُ الْمُطْمَئِنَّةُ ارْجِعِي إِلَىٰ رَبِّكِ رَاضِيَةً مَّرْضُوتَةً فَادْخُلِي فِي عِبَادِي وَأَدْخُلِي جَنَّتِي))
بقلوب مؤمنة بقضاء الله وقدره ينعي السادة آل جمجوم
فقيدهم المغفور له بإذن الله

الدكتور زين العابدين بكر جمجوم

و الذي انتقل الى رحمة الله تعالى ظهر اليوم الاثنين الموافق ١٧ أكتوبر
انا لله وانا اليه راجعون نعزي زملائنا اعضاء الجمعية السعودية لجراحة المخ والأعصاب
والوطن العربي وأهل الفقيد في مصابهم الجلل وتدعوا الله ان يتغمده بواسع رحمته ويلهم اهله
والصبر والسلوان

Forwarded

بإسمي وإسم أعضاء مجلس الرابطة السورية لأطباء الجراحة العصبية نتقدم بأحر التعازي
وأصدق المواساة لعائلة الأستاذ الدكتور زين العابدين جمجوم وكذلك لكافة الأشقاء جراحي
العصبية في المملكة العربية السعودية
أعظم الله أجركم، وإنا لله وإنا إليه راجعون
رئيس الرابطة السورية لأطباء الجراحة العصبية
د.وردان المير تامر

لا حول ولا قوة الا بالله. الله يرحم الاستاذ جمجوم ويغفر له ويسكنه فسيح جناته. عظم الله
أجركم.والهم اهله الصبر والسلوان Lakhdar Guenane

لا حول ولا قوة الا بالله
رحم الله استاذنا الفدير بروفيسور جمجوم واسكنه واسع جناته و الهم اهله وذويه ومحبيه الصبر
والسلوان انا لله وانا اليه راجعون .

انا لله و انا اليه راجعون، اللهم أغفر له وتجاوز عنه و أدخله فسيح جناتك يا رب العالمين
تعازينا الخالصة للأسرة الكريمة للمرحوم الأستاذ جمجوم و للإخوة في المملكة العربية السعودية
فهد الدرقاوي الحسني

انا لله و انا اليه راجعون، اللهم أغفر له وتجاوز عنه و أدخله فسيح جناتك يا رب العالمين
تعازينا الخالصة للأسرة الكريمة للمرحوم الأستاذ جمجوم و للإخوة في المملكة العربية السعودية
د حسام الحسيني

في هذه المناسبة الاليمة أتقدم بأخلص التعازي الى اسرة الفقيد والى كل الزملاء جراحي الدماغ
والاعصاب في المملكة العربية السعودية ساءلا الله عز وجل ان يتغمده برحمته الواسعة ويسكنه
فسيح جناته وانا لله وانا اليه راجعون.
د.عبد الصمد الوهابي

Dear dr. Abdulhakim and our neurosurgical colleagues.
With deep sorrow and sadness,
Please accept my sincere condolences to you and the grand
Jamjoom' family on the loss of Dr. Zain Alabedeen. May God
bless his soul, embrace him with his mercy and place him in
paradise .
With deep sorrow and sadness,
Imad kanaan& family

8:45 am

بإسمي وإسم كافة جراحي الدماغ والأعصاب بالجمعية المغربية لجراحي الدماغ والأعصاب
والعمود الفقري، أتقدم بأخلص التعازي وأصدق المواساة لعائلة المرحوم الأستاذ الدكتور زين
العابدين بكر جمجوم وكذا كافة الأشقاء جراحي المخ والأعصاب بالمملكة العربية السعودية
راجيا من المولى الرحيم أن يشملهم بعفوه ويرزقه فسيح جناته وإنا لله وإنا إليه راجعون.
أ. محمد بنزكموط
رئيس الجمعية المغربية لجراحة الدماغ والأعصاب والعمود الفقري.

NEUROSURGERY IN SAUDI ARABIA

Regional Variation in the Neurosurgical Workforce in Saudi Arabia

By Abdulhakim B. Jamjoom, Abdulahadi Y Gahtani And Bilal M. Sharab

King Abdulaziz Medical City
King Said Bin Abdulaziz University For Health Sciences
Jeddah

Disclosure: This report is extracted from a recent publication by the authors (Jamjoom A B et al. (August 21, 2022) *Regional Variation in the Neurosurgical Workforce in Saudi Arabia* *Cureus* 14(8): e28236. DOI 10.7759/cureus.28236)

Background: It is widely accepted that to maintain a healthy society, medical resources should be deployed where all patients can access them quickly and easily. The uneven geographic distribution of neurosurgeons has been reported at the global and national levels

In a recent publication (Mukhopadhyay et al, *Journal of Neurosurgery* 2019), the global neurosurgeon density in 2016 was calculated to be 0 - 58.95 (median 3.56) per million population. In the same report, the Kingdom of Saudi Arabia (KSA) was placed amongst countries that had a middle-range neurosurgeon density (4 per million population), based on a total number of 75 neurosurgeons in the country at that time. KSA is a large country with a total population of nearly 32 million and a total area of 2.15 million. Currently, the literature lacks up-to-date information on the density of

neurosurgeons in KSA and its different regions. The aim of this study was to highlight the disparity in the regional distribution of the neurosurgical workforce in the Kingdom of Saudi Arabia (KSA) and to correlate the provision of neurosurgeons in the regions with several parameters

Methods: The 13 administrative emirates of the provinces in KSA were divided into five geographical regions [central region (Riyadh), western region (Makkah and Madinah), eastern region (Eastern), southern region (Asir, Jizan, Najran, and Al-Baha), and northern region (Al-Qassim, Tabuk, Hail, Al-Jawf, and Northern Borders)]. The density of neurosurgeons was calculated for each region. The distribution of neurosurgeons among regions was correlated with several parameters using Pearson coefficient test.

Results: This study, examined 238 neurosurgeons working in 85 neurosurgical centres in KSA. The median (range) of regional density of neurosurgeons was 7.1 (3.1- 10.2) per million population and 9.3 (2.3- 23.3) per thousand Km² area.

Neurosurgery in Saudi Arabia

Table 1 summarises the distribution of the number of neurosurgeons, neurosurgical centres, population, and area according to the five KSA geographical region

Parameters	No.	Central Region	Western Region	Eastern Region	Southern Region	Northern Region
All Neurosurgeons	238	84(35%)	71(30%)	48(20%)	23(10%)	12(5%)
KSA-national neurosurgeons	108	48(44%)	34(31%)	17(16%)	6(6%)	3(3%)
KSA-certified neurosurgeons	41	18(44%)	13(32%)	8(20%)	2(5%)	0(0%)
GHs neurosurgeons	178	60(34%)	59(33%)	34(19%)	17(10%)	8(5%)
MOHHs & MCs neurosurgeons	103	27(26%)	40(39%)	18(17%)	12(12%)	6(6%)
MHs neurosurgeons	38	18(47%)	6(16%)	10(26%)	2(5%)	2(5%)
UHs neurosurgeons	25	6(24%)	10(40%)	6(24%)	3(12%)	0(0%)
KFSHs & RCS neurosurgeons	12	9(75%)	3(25%)	0(0%)	0(0%)	0(0%)
PHs neurosurgeons	60	24(40%)	12(20%)	14(23%)	6(10%)	4(7%)
All neurosurgical centres	85	21(25%)	26(31%)	22(26%)	10(12%)	6(7%)
GHs neurosurgical centres	51	8(16%)	17(33%)	14(27%)	8(16%)	4(8%)
PHs neurosurgical centres	34	13(38%)	9(26%)	8(24%)	2(6%)	2(6%)
Population (in millions)	31.8	8.2(26%)	10(31%)	4.9(15%)	4.8(15%)	3.9(12%)
Are (in thousand km ²)	2150	404(19%)	305(14%)	673(31%)	248(12%)	520(24%)
Mean all neurosurgeons per centre	2.8	4	2.7	2.2	2.3	2
Mean GHs neurosurgeons per centre	3.5	7.5	3.5	2.4	2.4	2
Mean PHs neurosurgeons per centre	1.8	1.8	1.3	1.9	2	2
Neurosurgeon per million population	7.5	10.2	7.1	9.8	4.8	3.1
Neurosurgeon per thousand km ² area	11.1	20.8	23.3	7.1	9.3	2.3

Abbreviations: No. Number, KSA: Kingdom of Saudi Arabia, GHs: Government Hospitals, MOHHs & MCs: Ministry of Health Hospitals and Medical Cities, MHs: Military Hospitals, UHs: University Hospitals, KFSHs & RCs: King Faisal Specialist Hospitals and Research Centres, PHs: Private Hospitals

Neurosurgery in Saudi Arabia

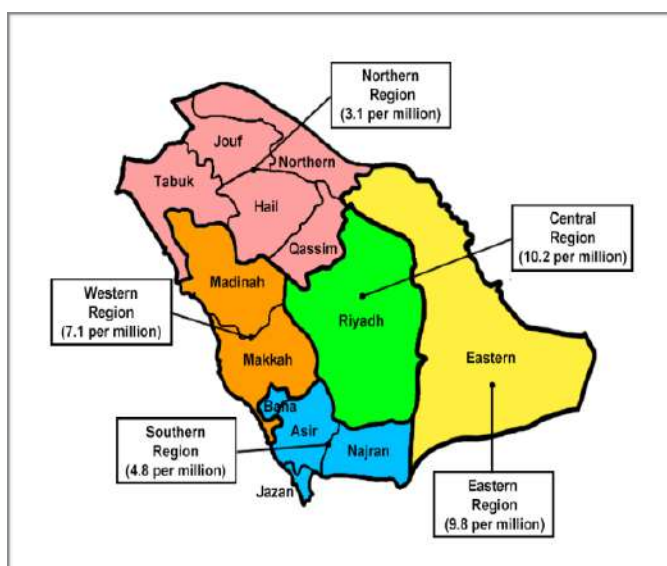


Figure 1 illustrates the distribution of the neurosurgical workforce per million population across the five major geographical regions in the Kingdom of Saudi Arabia.

The regional provision of neurosurgeons correlated significantly with the distribution of KSA-national ($P=0.0031$), KSA-certified ($P=0.0004$), government hospitals (GHs) ($P=0.0012$), and private hospitals (PHs) ($P=0.0359$) funded neurosurgeons. The regional allocation of neurosurgeons also correlated positively with the distribution of total neurosurgical centres ($P=0.048$), PHs centres ($P=0.0057$) but not GHs centres ($P=0.3296$). In addition, a discrepancy was found between the regional distribution of the neurosurgical workforce and the provision of neurosurgeons according to their GHs subdivisions, regional population, and area.

Study limitations: accuracy of data. Some practicing neurosurgeons may have been missed and were not included. Due to the dynamic changes in the population and the relatively high number of non-Saudi neurosurgeons, the regional neurosurgical workforce may have been altered since. Using

2017 population statistics for 2021 workforce data may not provide a true representation of the regional allocation in KSA in 2021. The variation in neurosurgeon density over time compared with the rate of population growth and the impact of regional variation in neurosurgeons in KSA on the standard of neurosurgical healthcare were not examined in the study.

Conclusions: The regional distribution of neurosurgeons in KSA was uneven. The density of neurosurgeons was lowest in the southern and northern regions. There was disparity in the number of neurosurgeons employed in the various subdivisions of GHs and the allocation of GHs neurosurgical centres across the regions. Easy access to high-quality neurosurgical care is essential. Policymakers should take this into consideration in future planning of regional neurosurgical services in KSA.

THE EXPERT'S VOICE

An Interview with A Neurosurgeon

We had the pleasure of interviewing a prominent neurosurgeon Dr. Mahmoud Al Yamany.

We are appreciative that Dr. Mahmoud was able to take time out of his busy schedule to answer some questions related to neurosurgery and the profession in general. It is our pleasure to hear his perspectives on neurosurgery.

Here's the interview:



SANS Newsletter (SN): What are you most proud of personally?

Mahmoud Al-Yamany (MY): I am personally most proud of being a son of the most wonderful parents, a father of seven wonderful children, a husband of a wonderful wife, the brother of the most wonderful siblings, and a citizen in the best country in the world

(SN): Describe yourself using three words.

(MY): Dedicated, honest, innovative

(SN): What are you passionate about?

(MY): I am passionate about neurosurgery, healthcare management, economics, and education and training

(SN): How do you handle stressful situations?

(MY): I handle stressful situations by trusting that the Almighty is always there for me to fall back on. Then I remind myself that as a human being, I am in control of the situation, because humans are the most resilient creatures when they choose to be

(SN): What are you known for?

(MY): Perseverance, futuristic, diligent worker, kind, adaptive learner, respectful, inspiring leader

(SN): Most overused phrase.

(MY): It will be fine.

(SN): What was the best advice anyone ever gave you?

(MY): Be yourself

(SN): If you were not a neurosurgeon, what career would you choose?

(MY): Lawyer

(SN): What is your favourite movie?

(MY): Avatar

(SN): How do you spend your spare time?

(MY): Reading novels, going for walks with my wife, or meeting with friends

(SN): You are one of the pioneers of Neurosurgery. What got you interested in neurosurgery?

(MY): I got interested in neurosurgery when I saw a child die from a brain tumour in my childhood. This led me to study medicine with the goal of becoming a neurosurgeon to treat brain tumours.

(SN): We are wondering about what is your genetic background. Do you have doctors in your family? How do your children look at you as a dad and neurosurgeon?

(MY): I was born and raised in Madinah, Saudi Arabia. I am the first doctor in my extended family and I chose this role myself because of my childhood experiences, for which I had to leave my hometown to study medicine six hundred miles away from my hometown.

Interview with Dr. Mahmoud Al-Yamany 2 / 4

For my children, I am not the neurosurgeon, but the loving father who guides, mentors and supports them

(SN): Which neurosurgeon (living or deceased) most influenced your neurosurgical career?

(MY): Dwight Parkinson

(SN): Can you please share some of your experiences in the early days of your practice?

(MY): I began my practice as a neurosurgeon at the Riyadh Medical Complex, which was quite primitive compared to the hospitals where I had done my training in North America. Resources were extremely limited, equipment was outdated, there were no policies or management guidelines, and there was no continuous medical education in the system. I then approached the authorities to change the status quo and make neurosurgery an advanced specialty. At certain times, I had to work between three different hospitals with clinics OR times admissions and critical patients in all of them. Then I was drawn to administration, and to do that properly, I enrolled in a master's programme in executive health administration and began to take on administrative responsibilities and grow into the role of health care management and leadership

(SN): As a successful neurosurgeon, how did you strike a balance among some roles and duties?

(MY): I believe that someone who has a passion for something will be successful at it. I took each task I took on with complete seriousness, making sure that no additional task compromised another, or I would give up one for the other. I was fortunate to have an understanding wife who supported me throughout my journey in both neurosurgery and management. I always had to remind myself that family comes first, because family is where the energy for everything else in life is fuelled

(SN): Could you describe your journey in Residency? Any lessons learned

(MY): I went through a tough residency in a department with five consultants 30 to 60 patients at any given time, a daily OR list and a busy emergency department with only one new surgery resident at the time. There

were times when I was in the hospital three days in a row and could only go home for six hours before I was back on duty at the hospital. There were times when I was humiliated under the guise of trying to train to be a solid neurosurgeon. I had to train myself in neurosurgery because everyone was busy in their practices. I was even called to do procedures on my own time, on vacation, or off service rotations. I was asked to cover neurosurgery calls in a busy referral hospital and trauma centre every other day for six months without a junior resident. I was asked to prepare weekly presentations for academic days while covering the entire service. As I gained experience, I was asked to cover two hospitals at once, both elective and emergency, and I was expected to know how to make a call and where to be, and where the junior resident for whom I had full responsibility would be. There were times when my vacation was cancelled simply because there was no one to take over the service, and there were times when I felt that certain people were discriminating because of their ethnicity. Despite all of that, I have to admit that I enjoyed every aspect of my residency, and if I were to go back, I would do the same thing again

(SN): What was your first experience actually working on the brain surgically, and do you remember it, and what did you feel about it?

(MY): I will always be in debt to Derek Fewer (the neurosurgeon), who allowed me to have my first surgical procedure after going over the steps with me and showing me how to do it. It was a small, superficial meningioma, but the feeling of performing the entire procedure is something that I will always remember

(SN): Describe the biggest issue you see challenging your practice?

(MY): I think the biggest challenge is continuing both paths (neurosurgery and health care management) while enjoying family life for the rest of my career.

(SN): What is the majority of your surgical practice? Do you have a specific case that sticks with you?

Interview with Dr. Mahmoud Al-Yamany 3/4

(MY): Most of my practice was in cerebral vascular and skull base surgery. I had difficult cases that I operated on that I will always remember as wonderful memories, but I also had others that did not produce the best results that I always remember to improve my outcomes. One of my best outcomes was a physician's mother who was bedridden because of a cranial dural arteriovenous fistula with a huge draining vein that was compressing her thalamus and brainstem. When I suggested surgical disconnection of the vein, my colleagues tried to dissuade me from the procedure because of the significant risk. But after I convinced them with the evidence, we agreed and performed the procedure. After 2 weeks, she was able to leave the hospital and continued to function properly

(SN): How do you feel about taking responsibility for choices that you know will profoundly affect your patient's life?

(MY): I do not make decisions for my patients, but I honestly explain all their options and offer second opinions to make sure they are comfortable with their decision, and I respectfully follow their wishes about how they want to be treated. There are cases where the patient is unable to make a decision due to their state of consciousness and there are no family members to make that decision. In those cases, I make sure we follow policy by having more than one neurosurgeon agree on what is the most appropriate treatment for the patient. This has allowed me to be at peace with whatever decision I have made, regardless of the outcome.

(SN): Upon the occasion of the 13th Annual Meeting of the Saudi Association of Neurological Surgery in 2019, the SANS Medal was awarded to you. Could you tell us more about it?

(MY): The SANS medal was a once-in-a-lifetime honour and a life experience that I will never forget. I was contacted by the head of the committee (Professor Ahmad Ammar) who informed me that I had been nominated for the

award through a very rigorous process, and I cannot describe the feeling I had, which was enhanced by the feeling of receiving the award during the opening ceremony of the conference

(SN): Could you talk about a time you took on a leadership role?

(MY): I was asked to start establishing a high-level neuroscience centre during King Fahad Medical City commissioning. At that time, I was offered a full-time position in neurosurgery at the most prestigious hospital in Saudi Arabia and the Middle East, this came as a hard choice between joining one of the best organisations in the region as a neurosurgeon and building a state-of-the-art neuroscience centre with all the challenges that entails. I chose the latter.

The second event occurred when I was asked to take on the role of CEO of one of the largest hospitals in the country instead of developing the national neuroscience institute that I had established just a few years earlier. Given the great challenge, I decided to take the larger role, and I think I excelled in that role.

(SN): As a successful neurosurgeon, what is important in neurosurgical training?

(MY): The most important aspect in neurosurgical training is to identify with the specialty from the beginning and make sure you have what it takes to become a neurosurgeon. It's a tough specialty with a tough training and a tough lifestyle, and if you do not have the right motive to see it through, you probably should not start in the first place

(SN): What advice would you give to students who aspire to be in neurosurgery?

(MY): Students should recognise their weaknesses and strengths and should have a clear understanding of their physical, mental, intellectual, and social abilities. They should be clear about what they want from neurosurgery and whether it is the right specialty for them given their skills

Interview with Dr. Mahmoud Al-Yamany 4/4

(SN): What future do you envision in neurosurgery?

(MY): Neurosurgery is an evolving field; it is the field of innovation, and with the evolving technologies of today, I see that neurosurgery will only expand to cover more needs and be more creative in solving medical problems.

(SN): Thank you for talking to us, and we are very proud of your achievements. Is there anything you can tell us that might surprise people reading the article?

(MY): As a type 1 diabetic who was diagnosed with diabetes at a very young age in the late 70's when type 1 diabetes was still very rare, I had a very tough time going through schooling, medical school, and then the tough neurosurgery residency and fellowship overseas & if it was not for my parents standing behind me every step of the way and then my wife who was (and still is) the ultimate support, I would not be who I am.

Dr. Mahmoud Al Yamany is Health and Well-being Sector Head at NEOM. He is the Chairman of the board of Directors, Al Madinah Health Cluster.

Dr. Al Yamany has also served as director of the National Neuroscience Institute, chairman of the board of directors of the Scientific Committee for Neurosurgery, medical director of neurology and head of the department of neurosurgery, both at King Fahd Medical City, and as a consultant of neurosurgery at the Riyadh Medical Complex.

He sat as chairman of the accreditation committee for health promotion at King Fahd Medical City, was a consultant of neurosurgery at King Faisal Specialist Hospital and Research Center, and was an honorary professor of assistant clinical neurosurgery at King Saud University.

CLINICAL CHALLENGE



By Dr. Mohammed Bafaquh
Consultant Neurosurgeon
King Fahad Medical City | Riyadh

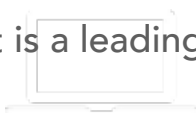
Question:

Which of the following regarding Papillary histological subtypes in craniopharyngioma is correct?

- A. More commonly seen in children.
- B. More commonly seen in adult.
- C. It never excite in adult.
- D. It is associated with blindness.
- E. It is a leading cause of mortality in children.

Which of the following regarding Adamantinomatous histological subtypes in craniopharyngioma is correct?

- A. More commonly seen in children.
- B. More commonly seen in adult.
- C. It never excite in adult.
- D. It is associated with blindness.
- E. It is a leading cause of mortality in children. .



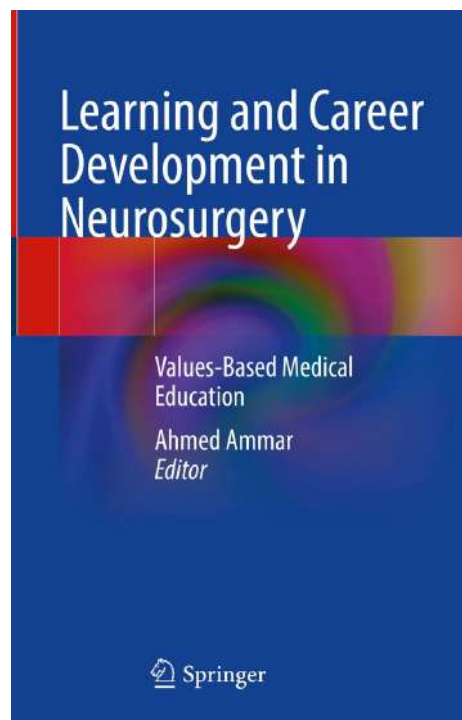
Neurosurgery Community

Latest News

THE BOOK IS OUT!

Editors: Ahmed Ammar

This book Provides a framework on how to evolve medical education and training by utilising hi-tech Focusses on medical ethics and Values-Based Medicine (VsBM) as guiding principles



Dr. David Penilla is going home

After 4 years of service in the Department of Neurosurgery of the King Abdulaziz Medical City, Ministry of National Guard - Health Affairs, Dr. David Penilla decided to return to his native Spain. He rendered outstanding service to the care of his patients by providing top-notch services, teaching our residents, introducing new technologies in spine surgery, and participating in various departmental activities. David will leave behind excellent memories

We all wish him a wonderful new stage in his career



Neurosurgery Community



By Prof. Ahmed M. Alkhani
King Abdulaziz Medical City| KAMC
Riyadh, Saudi Arabia

PANS_2022

13th conference of Pan Arab Neurosurgical Society (PANS), has successfully completed.

The 13th Pan Arab Neurosurgical Society (PANS) conference was held at Hotel Rotana, Salalah, Oman, August 5-7, 2022. This is the first PANS meeting after the Covid19 pandemic. The 12th version was held in Marrakesh in October 2018. The meeting consisted of a 3-day outstanding scientific program in the beautiful city of Salalah. The organization was outstanding, thanks to the local organizing team led by Dr. Ali Al Mashani, the new president of PANS. During the meeting, a new executive committee was elected. The new board is composed of:

- Dr. Ali Mashani (Oman) President,
- Dr. Ahmed Alkhani (Saudi Arabia) president-elect,
- Dr. Abdulraman Alshudaifat (Jordan) Secretary General,
- Dr. Abdulghafar Kiwan (Syria) head of scientific and training Committee
- Dr. Lekhdar Guenane (Algeria) Treasurer,
- Dr. Ibrahim Sbeih (Jordan) historian, and
- Dr. Mahdi Dramoli (Tunis) Member

As President-elect, I would like to invite you to the upcoming 14th Conference of PANS which will be held in Riyadh at the end of 2024. It will be hosted by our society (SANS). We need everyone's contribution to ensure a successful conference that will bring the pan-Arab society to a new frontier and represent the development of neurosurgery in our country.



19th Biennial Meeting of the World Society for Stereotactic and Functional Neurosurgery

The 19th biannual meeting of the World Society for Stereotactic and Functional Neurosurgery (WSSFN) was held in Incheon, Korea, in September 2022. The meeting was an outstanding event in the field of functional neurosurgery, discussing the latest developments in the ever-evolving technology in this field of neurosurgery. Korean expertise in organizing and conducting medical conferences was outstanding. Several new technologies in the field were explored at the meeting, including artificial intelligence, focused ultrasound lesioning, and spinal stimulation for spinal cord injury.

We at SANS are proud that two members of our society, namely Dr. Ahmed Alkhani and Dr. Faisal Alotaibi, were elected to the board of directors of this prestigious society. The only 2 members from the Middle East are from Saudi Arabia. Dr Alotaibi was reelected for a second term and Dr Alkhani was elected after stepping down as president of the Middle-Eastern Society for Stereotactic and Functional Neurosurgery (MSSFN). In addition, the next interim meeting will be held in Dubai in 2023. It is also worth mentioning that Prof. Andres Lozano (Canada), who received our SANS international award at the last SANS meeting in March 2022, was awarded the prestigious Spiegel-Wycis Award during the WSSFN meeting in Korea.

#WSSFN_2022

#PANS_2022



Neurosurgery Community

Social Media News



By Dr. Ahmed Najjar

First case of anterior cingulotomy in King Salman Medical City- Almadinah Almunawwarah.

In August 2022, a team of neurosurgeons consisting of Dr. Ahmed Najjar, MD, FRCSC, MSc and Dr. Ahmed Alshenkeiti, MD, SBNS performed the first anterior cingulotomy in Almadinah region, Saudi Arabia. The patient, a 57-year-old man, has refractory depression that has been treated

for years with medication and other psychiatric interventions. He was evaluated at Amal Psychiatric Hospital, King Salman Medical City, and deemed a candidate for surgical intervention. After the procedure, the patient's situation improved objectively within two months after the procedure. This procedure is well recognised among psychosurgeons and has a positive result in about 60% of very well selected patients.

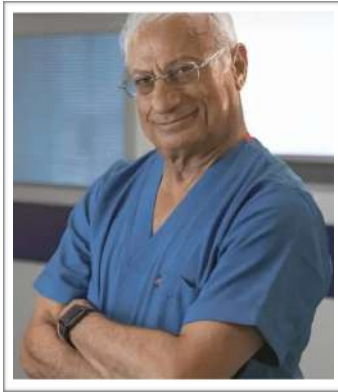


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Neurosurgery Community



OBITUARY



Dr. Osama El Ghannam

By Dr. Nasser El-Ghandour

President of ESNS

يوم حزين على أسرة جراحة المخ والأعصاب بمصر والعالم العربي، فقدنا رجلاً من أخلص وأعز الرجال، عرفناه خلقاً خدوماً متواضعاً محباً للحياة، تواصلنا بصفة مستمرة كأصدقاء بكل حب. كنت أجه دائماً وأقدره. كان رحمه الله أستاذاً عظيماً رفع من شأن مصر في العالم أجمع ولا نتخيل أن تقام أي مؤتمرات أو إجتماعات أو امتحانات بدون وجود أ.د/ أسامة الغنم، وجدناه دائماً في كل مكان حاضراً عالماً ومعلماً وداعماً قوياً شامخاً له فضل كبير على جميع الأجيال في مصر وللوطن العربي. ندعو الله بأن يتقبله في أعلى درجات الجنة مع الأنبياء والشهداء والصالحين، فقد كان من الصابرين.

إن العين لتدمع وإن القلب ليحزن وإنا لفرأقك
لمحزونون ولا نقول إلا ما يرضى الله إنا لله وإنا إليه
راجعون

Welcome to Our New Neurosurgery Residents | October |

SANS would like to congratulate the new residents in Neurosurgery Training Programmes.

It our my wish that you thoroughly explore the possibilities of training and learning.

Here is one of our new resident, Dr. Ali Hussain Dallak, who took a moment and share with us what his first step look like:



“

It is not important that we get it the first step. What is important is that we strive along the paths dearest to us and trust that one day we will arrive

CLINICAL CHALLENGE

The Answer

Craniopharyngioma...

- Clinical presentation:
 1. Increased intracranial pressure: Headaches, Nausea and vomiting.
 2. Local mass effect: visual impairment.
 3. Endocrine abnormalities: Hypothalamic impairment.
- Comprise 2% - 5% of all intracranial neoplasms.
 - 10% of non-neuroepithelial intracranial tumors of childhood.
- Current treatment strategies are debated.
 - Radical surgical strategies: Gross-total resection.
 - Debulking: Reduce the cells.
 - Other (Drains): reduce the cyst.
 - Radiation.
 - Chemotherapy.
- Typically located in the suprasellar area.
 - ~50% originate 3rd ventricle floor:
 - Infundibulum and/or tuber cinereum.
- Origin:
 - Epithelial tumors.
 - Remnants of the craniopharyngeal duct epithelium (Rathke's pouch).

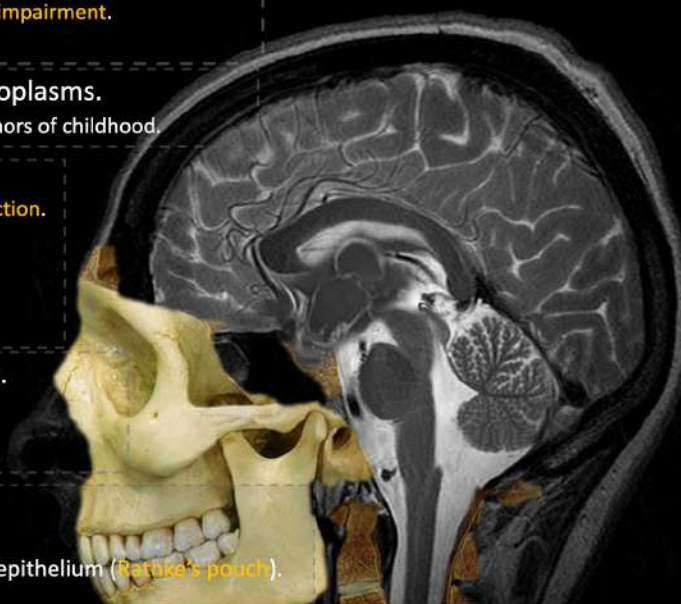
- Two histological subtypes:

- Adamantinomatous.

- Radiological: Rule of 90
- 90% cystic.
 - 90% calcifications.
 - 90% walls enhanced.
 - More common subtype.
 - All age groups:
 - Peak 1: 5–15 years.
 - Peak 2: 45–60 years.

- Papillary.

- Mostly restricted to adults.
- Radiological:
- Non-calcified.
 - Solid.
 - Well enhanced.



Local events

17th Annual Meeting of the Saudi Association of Neurological Surgery

**SANS
2023**

**17TH ANNUAL MEETING OF
THE SAUDI ASSOCIATION OF NEUROLOGICAL SURGERY**

MARCH 4TH, 2023
MARCH 5TH - 6TH, 2023

**WORKSHOP
CONFERENCE**

TAKING STANDARDS TO THE NEXT LEVEL

**SANS
2023**

CALL FOR ABSTRACTS

- Abstract submission beginning 1st October 2022
- Abstract submission deadline 31st December 2022

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VENUE: **Jeddah Hilton**

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Local events

SANS ACADEMY

VISION رؤية 2030
المملكة العربية السعودية

جامعة الملك سعود
King Saud University

SANS ACADEMY

4th Advanced Open Skull-base Dissection Workshop

December 24-25, 2022

SANS Lab Group

The Center for Research, Education & Simulation Enhanced Training, National Neuroscience Institute, King Fahad Medical City, Riyadh, Saudi Arabia

Target Audience:
Neurosurgery residents, fellows, and practicing physicians

Registration Fees:
Hands-on: 5000 SR Observer: 2500 SR
• 50% discount for SANS members and SCFHS local program trainees

For Registration:
[Click here](#) or scan the barcode



Medtronic

To register: Click [here](#)

VISION رؤية 2030
المملكة العربية السعودية

جامعة الملك سعود
King Saud University

SANS ACADEMY

4th Advanced Endoscopic Skull-base Dissection Workshop

January 7-8, 2023

Experimental Surgery & Animal Laboratory, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Target Audience:
Neurosurgery and otolaryngology senior residents, fellows, and practicing physicians

Registration Fees:
Hands-on: 5000 SR Observer: 2500 SR
• 50% discount for SANS members and SCFHS local program trainees

For Registration:
[Click here](#) or scan the barcode



Medtronic

ACCREDITED 16 CME HOURS

To register: Click [here](#)

Local events

SPINE UPDATE




12th SPINE UPDATE

In collaboration with
Zain Jamjoom Neurosurgery Skills Course

CADAVER WORKSHOP & CASE FORUM

DAY 1: CADAVER WORKSHOP
Thursday, December 29, 2022
Venue: Experimental surgery and Animal laboratory
Simulation center - King Saud University.

REGISTRATION PRICES FOR CADAVER WORKSHOP

3500 SR

DAY 2: CASE FORUM
Friday, December 30, 2022
venue: Crowne Plaza Riyadh
RDC Hotel & Venue.

REGISTRATION PRICES FOR CASE FORUM

350 SR

Audience:
Neurosurgery & Orthopedic surgery

SANS & SSS MEMBER FOR REGISTRATION BEFORE 10TH DECEMBER 2022

50%

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UPCOMING EVENTS

April
21-24
2023

[Learn more](#)

The 2023 AANS Annual Meeting
Los Angeles

27 Nov - 2 Dec
2022

[Learn more](#)

The 9th Comprehensive Clinical
Neurosurgery Course
Manama, Bahrain

September
09-13
2023

[Learn more](#)

The 2023 CNS Annual Meeting
Washington, D.C.

NEWSLETTER

Volume 3

Issue 4

SANS

Saudi Arabia

For more information ,you can
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<http://www.sans.org.sa>



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further our mission by supporting our newsletter in submitting articles and reviewing research. We always strive to make our newsletter more than just a newsletter by being informative and using them to serve the field of Neurological Surgery. We are always open to any ideas that will help us improve our newsletter.