

CHANGING PERSPECTIVES | I RAN INTO | TEACHABLE MOMENTS | SPOTLIGHT
INTERVIEW | NEWS | CLINICAL IMAGE | RADIOLOGY IMAGE | SOLVING EPIDEMIOLOGY

AMSj

Amsterdam
Medical
Student
journal

TEACHABLE MOMENTS |
THE IMPORTANCE OF PEER SUPPORT

SOLVING EPIDEMIOLOGY |
ASIAN TIGER MOSQUITO
(Aedes albopictus) IN
THE NETHERLANDS

- 2 Editorial
- ▶ 3 News
- ▶ 7 Teachable moments | *The importance of peer support*
- ▶ 8 Radiology image | *Acute leg pain during the running of a marathon in a female patient*
- ▶ 9 Clinical image | *More than meets the eye: diving deeper in to skin lesion*
- ▶ 10 Clinical image | *A life-threatening skin condition*
- ▶ 11 I ran into... | *In the Amsterdam UMC, I ran into Mark Wernke, operational security manager and interim manager of public services*
- ▶ 13 Interview | *Drs. Ellen Bosnak*
- ▶ 15 Spotlight - MD(PhD) | *Sara Ben Hmido MD/PhD Candidate Surgery at Amsterdam UMC location VUmc*
- ▶ 17 Solving epidemiology | *Asian tiger mosquito (Aedes albopictus) in the Netherlands*
- ▶ 19 Spotlight - Talent | *Winner of the Snapperprijs 2023 - Abdullah Almayali*
- ▶ 21 Changing perspectives | *Can less be more in the treatment of acute myeloid leukemia?*
- ▶ 22 Answers | *Radiology image*
- ▶ 23 Answers | *Clinical image*
- ▶ 25 About the cover
- ▶ 26 Colophon

The Amsterdam Medical Student journal (AMSj) is a scientific journal created and published by Amsterdam UMC staff members and students to promote research and to encourage other medical students to publish their clinical observations, research articles and case reports. Go to www.amsj.nl for publication options and to find out how you can contribute to AMSj as reviewer or member of the editorial board.



Editorial

Dear readership,

It is with great pleasure that, on behalf of the entire editorial board, I can welcome you to the 32nd edition of the AMSj! My gratitude goes out to our dedicated review staff and the members of the editorial board for the tireless effort that has been put into this amazing edition. Although this edition is somewhat short due to the summer break, we still hope that our compelling articles will help you to slowly enter the research world again!

In this issue, deep glioma is a returning subject. Marcus Cakmak and Thom Brouwer interestingly explore how artificial intelligence can contribute to the molecular and subgroup classification of diffuse glioma. Furthermore, for those curious about the origin of the dots on our cover, we invite you to read on until the end of this edition!

We are happy to introduce you to a fascinating article by Roos Frölke, shedding light on the epidemiology of the Asian tiger mosquito in the Netherlands and the potential concerning consequences of their growth in our region. We are enthusiastic about dedicating more attention to epidemiological subjects in our journal moving forward. In addition, we challenge you to test your knowledge of rare skin lesions and skin conditions by answering our clinical image questions on pages 9 and 10. What can cause severe and acute leg pain while running a marathon? Find out about this intriguing case on page 8.

As always, we would like to offer you interesting interviews and stories. This time, Raisa Boedhoe and Pelle de Koning share their conversation with the remarkable psychiatrist Ellen Bosnak. She shares insights into her journey in the field of psychiatry, her experiences as a psychiatrist in

Malawi, and why it is important to focus on the journey of your career rather than on the results. Furthermore, Jesse Lammerts discusses a particularly stressful event during his clinical rotation on page 7. He emphasizes the importance of open communication when dealing with impactful and emotional situations.

We strongly invite you to submit your own original article and immerse yourself in the world of scientific research publishing. AMSj is actively looking for new colleagues, including reviewers or editors. Check out our social media channels for information on available positions. Are you interested in working with us but not sure in what position or do you have other questions? Please, do not hesitate to contact the Editors-in-Chief through chief-editor@amsj.nl, we are very happy to help.

Finally, I am excited to have the honor of fulfilling the position of Editor-in-Chief VUmc, taking over from my wonderful predecessor Mees Hesmerg. On behalf of the entire AMSj editorial board, I would like to thank Mees for his outstanding contributions. Fortunately, Mees will remain a part of our team as a reviewer and will continue to publish original articles in our journal.

Please enjoy this issue of the Amsterdam Medical Student journal and we wish you a pleasant and successful start of the academic year!

Yours Sincerely,

Tina Vekua
Editor-in-Chief
Amsterdam UMC,
location VUmc



WHAT'S NEW

Can we regenerate cartilage with the help of lizards?

JENS P. TE VELDE¹ AND MEES K. HESMERG²

1. MEDICAL STUDENT/PHD CANDIDATE ORTHOPAEDIC SURGERY, AMSTERDAM UMC

2. PHD CANDIDATE ORTHOPAEDIC SURGERY, AMSTERDAM UMC

While lizards, unlike some amphibians, may not be able to regenerate entire limbs, they do have regrowing qualities as well. Also, they are more related to humans and other mammals. Researchers at the University of Southern California (U.S.) studied the lizard's ability of blastema formation and chondrogenesis, the formation of cartilage tissue, that allows the green anole lizard (*Anolis carolinensis*) to regrow its tail using RNA sequencing.

The research team learned more about changes in the gene activity of specific fibroblasts that enabled cartilage regeneration. In addition,

they discovered immune cells, called septoclasts, in tail tissue that contribute to inhibiting the scarring process in lizards. The septoclasts were implanted in the lizards' limbs and successfully induced cartilage rebuilding in limbs that lacked regeneration. Unfortunately, (adult) human cartilage tends to scar which prevents tissue regeneration. This could cause osteoarthritis at a later age, for which there is no known cure while it affects over 500 million people worldwide.

If this could be recreated in mammals, such as mice, this might be a revolutionary step in treating cartilage degeneration. In a slowly aging world, this could be helpful to an unthinkable number of current and future patients.

1. Vonk AC, Zhao X, Pan Z. et al. Single-cell analysis of lizard blastema fibroblasts reveals phagocyte-dependent activation of Hedgehog-responsive chondrogenesis. *Nat Commun* 14, 4489 (2023).

How to predict nivolumab treatment results: count neutrophils and lymphocytes

MERT ULUC[†]

1. FACULTY OF MEDICINE, AMSTERDAM UNIVERSITY MEDICAL CENTERS, LOCATION VUUMC AND ACADEMIC CENTER FOR DENTISTRY AMSTERDAM (ACTA), VRIJE UNIVERSITEIT AMSTERDAM, AMSTERDAM, THE NETHERLANDS.

In recent years, immunotherapy, like nivolumab, has been added to the treatment arsenal regarding recurrent oral squamous cell carcinoma (OSCC). However, less than 20% of patients show a response.¹ This underscores the need for prognostic indicators to guide treatment decisions.

An increase in tumor-associated neutrophils (TANs), and thus a change in the neutrophil-to-lymphocyte ratio (NLR), has been observed in malignancies such as renal, bladder, lung, and skin cancer. Regarding OSCC, however, little is known.

One article regarded a multicenter, retrospective study in which they looked at the NLR of

the responders to nivolumab (N = 16) and non-responders (N = 48).² Median NLR post-treatment was 4.0 (2.6-6.3), among responders, and 6.4 (4.0-14.0), among non-responders. After nivolumab treatment, the responders showed a significantly lower NLR compared to the non-responders ($p < 0.01$).

Overall survival (OS) analysis using a Kaplan-Meier curve shows that patients with a low NLR (< 5) post-treatment had a higher OS than those with a high NLR (≥ 5) (22.0 vs. 6.0 months, $p = 0.0001$). No hazard ratio was mentioned.

Although pretreatment NLR lacks predictive value for nivolumab efficacy, post-treatment NLR could serve as a prognostic marker.

1. Ferris RL, Blumenschein GR, Fayette J, et al. 2016. Nivolumab for recurrent Squamous-Cell carcinoma of the head and neck. *The New England Journal of Medicine* 10 november 2016;375(19):1856-67.
2. Tachinami H, Tomihara K., Yamada SI, et al. 2023. Neutrophil-to-lymphocyte ratio as an early marker of outcomes in patients with recurrent oral squamous cell carcinoma treated with nivolumab. *British Journal of Oral and Maxillofacial* 1 may 2023;61(4):320-6.

GERIATRICS | INTERNAL MEDICINE - ONCOLOGY | ORTHOPAEDICS SURGERY - NEUROLOGY, OROMAXILLOFACIAL

Is the thymus more important during adulthood than we thought?

DENISE ABBEL¹

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUUMC

To optimize the immune system, the thymus produces T-lymphocytes. During infancy, the physiological atrophy of the thymus starts and consequently, the thymic activity decreases with age. The function and importance of the thymus in adults are unknown.

Kooshesh et al. aimed to investigate if thymectomy affected mortality, the risk of cancer, autoimmune disease, and infections. In total, 1420 thymectomy patients were compared to 6021 matched control patients who had undergone non-laparoscopic cardiac surgery.¹

Results showed that thymectomy patients were twice as likely to die (8.1% vs. 2.8%; relative risk (RR): 2.9; 95% confidence interval (CI): 1.7 - 4.8) and twice as likely to be diagnosed with cancer

in the first five years after surgery compared to the matched controls (7.4% vs. 3.7%; RR: 2.0; 95% CI: 1.3 - 3.2). After excluding patients with preoperative infections, cancers, and autoimmune diseases, the risk of autoimmune disease five years after surgery was higher in thymectomy patients compared to the controls (12.3% vs. 7.9%).

Causal claims cannot be made due to the observational design of this study, but the results support an association between thymectomy and adverse events. It is unknown if the possible mechanisms underlying are caused by a decline in T-cell differentiation or if the thymus has a currently unidentified role in the immune system. These results however suggest that the thymus is still functionally important during adulthood and that during treatment, if possible, preservation of the thymus should be considered.

1. Kooshesh KA, Brody H., Sykes DB et al., U. 2023. Health Consequences of Thymus Removal in Adults. *N Engl J Med*, 389, pp 406-417.

Quantitative PET features as novel biomarkers in lymphoma

EZGI B. ULAS¹ AND JULIA DRIESSEN²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUUMC, VRIJE UNIVERSITEIT AMSTERDAM, AMSTERDAM, THE NETHERLANDS

2. DEPARTMENT OF HEMATOLOGY, AMSTERDAM UMC, LOCATION AMC, UNIVERSITY OF AMSTERDAM, AMSTERDAM, THE NETHERLANDS

¹⁸F-Fluorodeoxyglucose (FDG)-Positron Emission Tomography (PET)-Computed Tomography (CT) scans are used for disease staging and assessment of treatment response in patients with lymphoma. While nowadays these scans are being interpreted visually by a nuclear medicine physician, quantitative analysis of PET scans could provide a more precise method for staging and response assessment, as well as for use as a prognostic tool. In a narrative review, Alderuccio et al. discuss the current knowledge and challenges of implementing quantitative PET analysis, or radiomics, in patients with lymphoma.¹

Radiomics is a method of quantitative PET analysis that extracts differences in FDG intensity

of the tumor, shape, volume, and intra- and intertumor heterogeneity. The most broadly studied PET-based biomarker in different types of lymphoma is the total metabolic tumor volume (MTV). MTV is the volume of FDG-avid tumor shown on PET scans and thereby gives an indication of the glycolytic phenotype and overall tumor burden. Many studies have shown that a high MTV is associated with a poor prognosis. Other radiomics features are currently being studied and making their way into prognostic models for usage in clinical trials. In addition, machine learning tools can help to analyze PET data with specific algorithms and therefore improve risk stratification, which, in turn, can improve clinical decision-making. Further research and incorporation into clinical trials are needed to implement these PET-based biomarkers into clinical practice.

1. Alderuccio, J. P., Kuker, R. A., Yang, F., & Moskowitz, C. H. (2023). Quantitative PET-based biomarkers in lymphoma: Getting ready for primetime. *Nature Reviews Clinical Oncology*.

WHAT'S NEW

DeepGlioma: using artificial intelligence to rapidly classify diffuse gliomas

MARCUS ÇAKMAK¹ AND THOM P.A. BROUWER²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUmc


2. DEPARTMENT OF NEUROSURGERY, AMSTERDAM UMC, LOCATION AMC

Diffuse glioma is the most common primary brain tumor and has the highest mortality rate. In recent years, molecular classification has been further developed and is used to create subgroups of diffuse glioma. These classifications can be used to predict the clinical course of the tumor and provide personalized care. However, access to molecular diagnostic testing for glioma patients is limited. This results in limited molecular classification appliance, leading to suboptimal care for glioma patients and making prognostic prediction difficult.

Hollon et al.¹ conducted a multicenter (four institutions) study to create a model to accurately predict the molecular characteristics of diffuse glioma. Stimulated Raman histology (SRH), a rapid optical imaging method, and deep learn-

ing-based image classification were used to create the prediction tool. The predicted features include IDH classification, 1p19q-codeletion, and ATRX loss. These features are recognized by the World Health Organization (WHO) to classify diffuse glioma types. A total of 153 patients with a diffuse glioma diagnosis were included in the prospective testing cohort. The model, called DeepGlioma, could accurately predict the molecular classification in 93.2% of the cases and identified the correct subgroup diagnosis in 91.5% of the patients. These results were achieved within two minutes in the operating room and outperformed conventional IDH1-R132H immunohistochemistry.

The study shows that AI-based methods for molecular classification and subgroup classification of diffuse glioma are accurate and fast. These methods can potentially support and improve the diagnostic process for diffuse glioma in the future.

1. Hollon T et al, Artificial-intelligence-based molecular classification of diffuse gliomas using rapid, label-free optical imaging. *Nat Med*, 2023. 29(4): p. 828-832. 



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The importance of peer support

JESSE LAMMERTS¹

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION AMC



During my surgery rotation, I spent a day assisting with gynecological surgeries. The first cesarean section (CS) was completed smoothly and the second epidural had just been set. Suddenly, the anesthesiologist interrupted the OR; within half an hour an emergency CS would arrive for a woman with an almost a-term baby. The ambulance came in, the mother was immediately put under general anesthesia and the baby was out in less than fifteen minutes. The mother was stable, but the baby was getting bluer and bluer. After a long, frantic attempt to get the baby to breathe and get the heart going, the doctors had to give up... The baby didn't make it.

All this happened right in front of me, the first time I saw someone die. I had a constant internal conflict, on the one hand, I didn't really want to see this baby slowly dying but also didn't want to look away.

“All this happened right in front of me, the first time I saw someone die”

Right after, we went to discuss this situation with the involved team. This not only focused on technical questions such as "what should have been done differently?", but also on emotional support. It was strongly emphasized that there is always room to sit down again if someone runs into something in the future.

The following days were very tough. Upon entering the OR complex, it had already begun; images of what had happened flashed by, and a constant feeling as if I had to cry came over me. The first few days I went home a little earlier. I had thought that the first debriefing had been sufficient and that I could process it myself. After going home earlier on the third day, I decided to accept the offer to talk about it again. An extensive conversation followed with two of the involved care providers. They told me what had happened, that mother had ended up in a car accident, in which the car belt had hit her abdomen with great force. Fortunately, the mother was doing well. Once again, we talked about the impact that such a situation could have on you and all the feelings it can cause.

By discussing everything again, hearing about the mother's situation, and getting the context, a burden fell off my shoulders. After the conversation, I was able to process my feelings and get back to the OR complex without any more problems. This has taught me that I shouldn't be afraid or ashamed to discuss impactful events like this. ◀

“This has taught me that I shouldn't be afraid or ashamed to discuss impactful events like this”

Acute leg pain during the running of a marathon in a female patient

MATTHIJS J. VAN EE¹ AND PROF. DR. MARIO MAAS²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION AMC

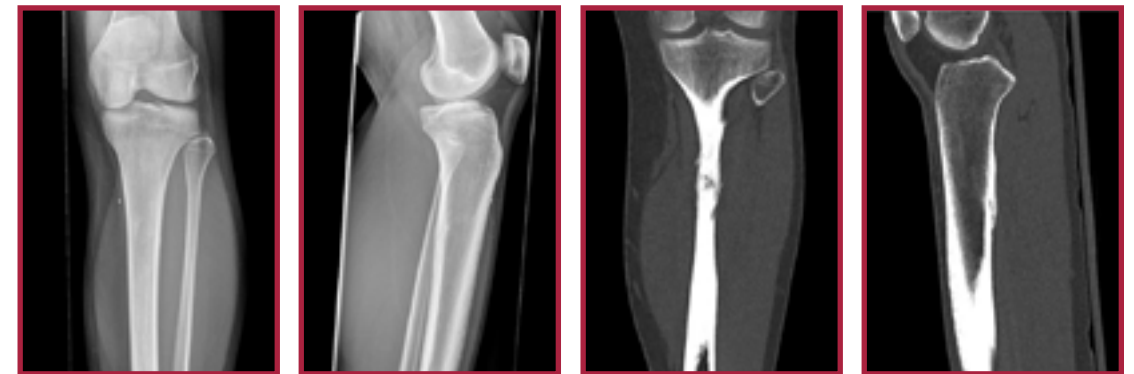
2. DEPARTMENT OF RADIOLOGY AND NUCLEAR MEDICINE, AMSTERDAM UMC, LOCATION AMC



CASE

A 25-year-old female presented with insidious pain in the left lower leg, persistent for 4 weeks. Two weeks ago, during the marathon of Amsterdam, she experienced acute pain that forced her to abandon the race. The patient was unable to engage in sports afterward.

X-rays of the affected leg revealed:



QUESTION 1

Based on the provided X-ray, what type of injury is seen in the left lower leg?

- Greenstick fracture
- Stress fracture
- Posterior tibial tendonitis
- Medial tibial stress syndrome (shin splints)
- Osteoid osteoma

QUESTION 2

Which segment of the tibia is impacted in this case?

- Posteromedial
- Anterolateral
- Anteromedial
- Posterolateral

QUESTION 3

What treatment approach is recommended for the patient's injury?

- Immediate surgery
- Physical therapy
- Rest and immobilization
- No treatment is needed (besides pain management)

QUESTION 4

What is the primary risk factor for this type of injury?

- Genetic predisposition
- Cold weather exposure
- Inadequate calcium intake
- Participation in high-impact sports
- History of a previous injury

More than meets the eye: diving deeper into skin lesions

YASSMINA DERRAZE¹ AND JURRIEN STIEKEMA²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUMC

2. DEPARTMENT OF SURGERY, NOORDWEST ZIEKENHUISGROEP, ALKMAAR, THE NETHERLANDS



CASE

A 52-year-old female was directed to the surgical department to remove a skin lesion that was thought to be an epidermoid cyst. However, upon thorough examination of the abdomen and subsequent biopsy, it became evident that the nature of the lesion was not that of a typical epidermoid cyst.

QUESTION 1

During physical examination, you notice a firm, raised nodule with a reddish-brown color. The lesion is not fixed to the underlying tissue and has a diameter of 5x4 centimeters. Which of the following is the most likely diagnosis?

- A. Basal cell carcinoma
- B. Seborrheic keratosis
- C. Dermatofibrosarcoma protuberans
- D. Malignant melanoma

QUESTION 2

Upon further genetic testing, the COL1A1-PDGFB fusion gene was found. What important information does this genetic finding provide regarding the patient's condition?

- A. Likelihood of benign tumor development
- B. Higher risk of metastasis
- C. Susceptibility to viral infections
- D. Potential response to immunotherapy
- E. Association with autoimmune disorder

QUESTION 3

What is the primary treatment approach for this patient?

- A. Chemotherapy
- B. Immunotherapy
- C. Targeted therapy against PDGFB
- D. Surgical excision with wide margins



Answer on page 23 ►

A life-threatening skin condition

MARJOLEIN A. KEESENBERG¹ AND NIEK H. SPERNA WEILAND²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUMC

2. DEPARTMENT OF ANESTHESIOLOGY, AMSTERDAM UMC, LOCATION AMC



CASE

A 45-year-old man presented with acute, severe skin disruptions and fever. He has a history of hypertension and hypothyroidism. Only three weeks ago he presented with pyelonephritis for which he was treated with ciprofloxacin.

QUESTION 1

What is the most likely diagnosis?

- A. Graft versus host disease
- B. Toxic epidermal necrolysis
- C. Bullous toxicoderma
- D. Systemic lupus erythematosus

QUESTION 2

What medication is notorious for causing this clinical image?

- A. NSAIDs
- B. Different sorts of chemotherapy
- C. Prednisolone
- D. Antipsychotics

QUESTION 3

What is the mortality of this disease?

- A. 5-15%
- B. 15-25%
- C. 25-35%
- D. 35-45%



<https://www.nhs.uk/conditions/stevens-johnson-syndrome/>
Webste, N. (2022, 8 July). Stevens-Johnson Syndrome. nhs.uk.

Answer on page 24 ►

In the Amsterdam UMC, I ran into Mark Wernke, operational security manager and interim manager of public services



INTERVIEWED BY ARMEL BOES¹ AND LIFFERT VOGT²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUMC

2. DEPARTMENT OF INTERNAL MEDICINE, SECTION NEPHROLOGY, AMSTERDAM UMC, LOCATION AMC

Could you tell us something about your responsibilities?

Currently, I carry responsibility for three different departments in the hospital. One of them is security, for which I work the most in this hospital. Also, albeit temporarily, I have the responsibility for the reception and the call center. The hospital is looking for a new manager for the latter two departments. Normally, I work for the security and I am responsible for a couple of things. For example, I do the supervision of the daily shifts, but I also take care of particular resources that the security needs to complete daily tasks. Furthermore, I take care of the schedule for the employees. The security department is also responsible for the parking places around the hospital and the restraining orders for particular persons. These are mainly used on visitors who committed criminal offenses before.

“These are mainly used on visitors who committed criminal offenses before”

What does a typical day look like?

My workday starts at 06:30 in the morning and ends at 16:00 in the afternoon. However, I am free to change that if necessary. Usually, I want to be in the office before everyone else comes in. This way I am able to make sure everything goes as planned and that the start of the day is fine. After that I have my own tasks to do. There is no set schedule for each day. At the moment I am busy with a couple of protocols, but that is not always the case.

“There is no set schedule for each day”

What do you like most about your job?

The work is very variable. For example, sometimes there is a medical doctor who needs security while handling an aggressive patient. A moment later you are in a hurry because an alarm went off in a store. Also, it is possible that you assist with air-field security when the medical helicopter comes in or you could help with a problem like a seizure or reanimation. It is also interesting that the cases or persons are different in the hospital than in a security job elsewhere. For example, a case could be about a person who wants to commit suicide or it could be about a patient struggling with emotions such as anger or grief. It is important that you know how to help in such a situation. Currently I am working in a more management-type role so I personally see these cases less than before. However, it is still good to help the team when dealing with such sometimes difficult situations.

Which colleagues do you work closely with?

At the reception and call center are two coordinators who I can speak with and who I have frequent meetings with. They take away a lot of the daily responsibilities for these departments. These could be issues with the schedule or questions from employees at the departments. Furthermore, I have two other operational managers as well as the head of the department with whom I have frequent contact. But the team is far greater than the people I mentioned before.



Mark Wernke, operational security manager and interim manager of public services

Which education have you followed?

I finished a couple of studies. These were the Intermediate Vocational Education in Security, a degree in Coordinating Security, and a study in Security Management. The last study was more about making protocols for security issues which I did not like very much. I like to work in the field and less to sit behind a desk which was the case with this study. During my studies I decided to work in the security of the AMC, which later became the Amsterdam UMC.

Do you have ambitions for in the future?

For me, my most important ambition is to keep on learning. I hope to start another study in the future. This would probably in the field of security because I love my job very much. At this moment I have not yet found the time to start this, but I am sure that this will change. In the past I have made a couple of promotions, so I am very grateful for the position that I am in. I feel lucky that I can be part of this organization who has given me a lot of opportunities.

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Drs. Ellen Bosnak

INTERVIEWD BY RAISA BOEDHOE¹ AND PELLE DE KONING²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION AMC

2. DEPARTMENT OF PSYCHIATRY, AMSTERDAM UMC, LOCATION AMC



Drs. Ellen Bosnak

Could you please introduce yourself?

My name is Ellen Bosnak and I work as a psychiatrist at Amsterdam UMC, location AMC. I'm married, have three children, and live in Weesp, so I have the pleasure of going to the AMC by bike. Half of the week my work consists of liaison psychiatry, where I oversee consultations and supervise at the psychmed unit. The other half of the week I'm involved in teaching, developing, and delivering education in psychiatry and also related fields in the BA and MA programs at the UvA faculty of medicine.

When did you realize psychiatry was your dream?

I was drawn to psychiatry during my internships. The direct personal interactions with people during

crucial times in their lives deeply resonated with me. During those internships, my thought process shifted and led me to deeply consider conversations from a meta-perspective. During those days, there was a period when no residents were available at the outpatient clinic, so I had the opportunity to be under the direct supervision of a psychiatrist as a student. At that moment, while shadowing the psychiatrist, I realized: I could see myself doing this.

After my graduation, I spent my first three years working as a psychiatrist in Malawi, South East Africa. There, I discovered my passion for teaching. I realized that if I could make a difference to students in Malawi practically on my own, I could do at least the same with a whole team back in the Netherlands.

“There, I discovered my passion for teaching”

What makes you so enthusiastic about teaching?

It excites me to see people becoming motivated to learn. Witnessing students develop a genuine interest in psychiatry and seeing their educational progress is deeply rewarding for me. However it's not always easy. While students often readily recognize the importance of fields like internal medicine, the value of psychiatry can be less obvious to them. This was even more challenging in Malawi: I can remember two boys in the back of the class who were initially rather skeptical about the

CURRICULUM VITAE

1995	Birth year
2005	Graduation medicine, university
2006	Start residency
2012	Function as specialist

PAST POSITIONS

- Deputy head, Department of Mental Health, Consultant psychiatrist, senior lecturer, College of Medicine (currently Kamuzu University of Health Sciences), Blantyre, Malawi

CURRENT POSITIONS

- Liaison psychiatrist, Amsterdam UMC, location AMC
- Principal Educator 'Student Engagement
- Deputy program director ad int Master of Medicine, University of Amsterdam
- Education Coordinator, Division Neurosensory Specialties, Amsterdam UMC
- Education Coordinator Psychiatry teaching Bachelor and Master programs of medicine, University of Amsterdam, including coordination of WDD-3 (Ba)

E-MAIL ADDRESS

e.m.bosnak@amsterdamumc.nl

existence of the field of psychiatry in the African setting. After 6 weeks I heard them discussing,

"...that must be a frontal problem because that woman is so disinhibited".

At that moment I realized that my teaching efforts were effective. I also find it incredibly fulfilling when I can help students overcome a challenge they've been grappling with, by sharing my knowledge and inspiring them.

Can you name some highlights of your career?

I find that quite a difficult question. I'm someone who believes that "the journey is as beautiful as the destination". During my time in Malawi, I experienced almost weekly highlights, making high-

stakes decisions and feeling a profound sense of responsibility, shared not only by me but also by my very few colleagues. Each individual we tried to help was severely ill, and many made significant recoveries through appropriate treatment. Those experiences were tremendous learning opportunities where I also discovered my passion for teaching.

More recently I have been honored with several awards from student associations—CoRaad and MFAS. It is very flattering to receive compliments about being a good clinical supervisor or an appreciated teacher during the WDD 3 course. However, when I find myself somewhere on a random Thursday morning witnessing a student doing something they couldn't manage just the previous week provides its own unique sense of achievement. So essentially, my answer is complex, due to the array of experiences that have shaped my career.

“...the journey is as beautiful as the destination”

What advice would you give to students interested in this field?

As a student, it is important to seek inspiration and not be afraid to have fun both within and outside your field; take lessons from it. Carefully consider what truly energizes you, assess that honestly, and pursue it wholeheartedly. Making bold decisions is essential. The beauty of making a choice is that it's never final; you can always revisit it. For example, my decision to work in Malawi might not have seemed the most logical career move at the time, but it ultimately turned out to be one of my most valuable experiences. ◀

Sara Ben Hmido¹

1. MD/PHD CANDIDATE SURGERY AT AMSTERDAM UMC LOCATION VUUMC



In the column 'Spotlight' we shine a light on students who published their research in other journals and (future) doctors who received something special, like a PhD title or funding for their research. Meet Sara Ben Hmido, MD/PhD candidate at Amsterdam University Medical Center. Read more about her compelling journey towards achieving the MD/PhD-candidate status and find out her doctoral research in the realm of machine learning for predicting anastomotic leaks in colorectal surgery.

My name is Sara, I am 20 years old and I just completed my Honours Bachelor's degree in Medicine at VU University last academic year. My study in medicine has been a truly enriching experience for both my personal and academic development. Beyond my academic pursuits, I have also been actively involved in the field of surgery as an operating room assistant in the trauma surgery department at the Spaarne Hospital. Throughout the last three years, I have witnessed myself transform from a fresh student into an emerging researcher.

"... I have witnessed myself transform from a fresh student into an emerging researcher"

My opportunity to pursue a PhD was afforded to me through my bachelor's thesis. During my final year of the bachelor, I was presented with the opportunity to write a thesis on a topic of my choice.

This initiated my search for a research project. I quickly connected with Dr. Daams, a surgeon with an immense passion for the study of anastomotic leaks. For my thesis, I immersed myself in the utilization of Machine Learning (ML) models for predicting postoperative complications. The experiences I gained while writing my thesis and within the research group have strengthened my love for research and ignited my desire to pursue a PhD journey. It led me to being offered a PhD position in Dr. Daams' research team. My doctoral research will focus on the implementation of ML models for predicting postoperative complications in colorectal anastomotic leaks (CAL) in colorectal surgery.

The notion that our research can pave the way for a future in which ML models are routinely applied in clinical practice fills me with inspiration and ambition. It is my conviction that by embracing innovation and pushing the boundaries of modern medicine, we can enhance healthcare and effect positive change in the lives of countless patients. These models have the potential to have a significant impact on clinical practice, with early detection of complications leading to improved treatments, reduced hospital stays, and ultimately, enhanced

prognoses and quality of life for patients. Therefore, research on ML models is invaluable for the future of colorectal surgery. With enthusiasm and determination, I will dedicate myself as a researcher to contribute to the improvement of healthcare and patient outcomes.

Combining my PhD research project with my Master's in Medicine is indeed a challenging endeavor. It will require careful planning, effective time management, and open communication with both my academic supervisors and clinical mentors. Currently, I am fully engaged in writing my Master's thesis, and will soon begin my clinical residency. This period is expected to be highly demanding as I strive to balance my academic commitments with my clinical experiences. Although it will undoubtedly be an intense period, I am eager to continue combining my passion for medicine with conducting research. I look forward to further developing myself as both a researcher and a clinical professional during this valuable journey.

"Where there is a will, there is a way!" This empowering mantra has consistently propelled me to strive for my best, not only in my research and the medical field but also in my personal growth. Throughout my journey, I have learned to embrace the obstacles that come my way, viewing them not as roadblocks, but as unique opportunities for self-improvement and evolution. These experiences have become the building blocks of my personal and professional growth, they will shape you into a better researcher, medical professional, and individual

"Where there is a will, there is a way!"

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Asian tiger mosquito (*Aedes albopictus*) in the Netherlands

Roos Frölke¹
1. MSc STUDENT MEDICINE



Epidemiology, the study of the distribution and determinants of health-related events in populations, is crucial for understanding health and disease patterns and guiding public health interventions.¹ Climate change refers to a long-term change in weather conditions and patterns of extreme weather events. It may lead to interesting changes in the epidemiology of infectious diseases worldwide. The spread of invasive mosquito species has drawn attention due to their potential impact on public health and ecosystems.^{2,3,4} Recent reports by the Nederlandse Omroep Stichting (NOS) have highlighted the alarming increase in the prevalence of the Asian tiger mosquito (*Aedes albopictus*) in the Netherlands.^{5,6,7} This review briefly describes the changing epidemiology and presence of this mosquito species in the Netherlands, shedding light on its distribution, lifecycle, ecological preferences, and public health.

Originally native to Southeast Asia, *Aedes albopictus* has extended its reach to various regions due to climate change and globalization.⁸ In the Netherlands, its presence has been confirmed in multiple regions since 2005, raising concerns about its potential impact on local ecosystems and the transmission of diseases like dengue.⁷

Understanding the lifecycle of *Aedes albopictus* is crucial for predicting its population dynamics and developing effective control strategies. Female mosquitoes lay their eggs in diverse containers, such as used tires and bamboo tree holes. If these materials are then exported to other countries, populations arise in new regions.^{9,10} For instance, in 2005, *Aedes albopictus* was introduced in the Nether-

lands via imported Lucky Bamboo, an Asian water plant.¹¹ The mosquito's life cycle comprises of four stages: egg, larva, pupa, and adult. The eggs are remarkably resilient, capable of surviving various environmental conditions. Although cold Dutch winters may hinder their overwintering and adult survival in many areas, hot summers and mild winters can facilitate population growth.¹²

If *Aedes albopictus* populations manage to sustain and proliferate in the Netherlands, multiple concerns arise. The presence of this mosquito species may cause potential ecological disturbances, as the invasive species may compete with native mosquitoes for resources and breeding sites. This competition could result in shifts in local mosquito populations and their ecological roles. Furthermore, the potential transmission of vector-borne diseases may also become a concern. In 2020, seven individuals in Utrecht and Arnhem contracted West Nile virus from local mosquitoes, underscoring the risk of the sudden emergence of tropical infectious diseases.¹³ Although this emergence seems negligible now, the prevalence of these tropical diseases may increase if favorable environmental conditions persist.

In conclusion, the presence of *Aedes Albopictus* in the Netherlands may become a significant concern if populations manage to sustain and proliferate. If *Aedes Albopictus* continues to establish itself in new regions, ongoing research, monitoring, and collaboration among experts are essential to effectively manage its impacts on ecosystems and public health.

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Winner of the Snapperprijs 2023 - Abdullah Almayali¹

1. FACULTY OF MEDICINE, AMSTERDAM UMC LOCATION VUMC



In the column 'Spotlight' we shine a light on students who published their research in other journals and (future) doctors who received something special, like a PhD title or funding for their research. Recently, Abdullah Almayali, a former board member of AMSj, has been honoured with the prestigious Snapperprijs award. This distinguished commendation is bestowed upon medical students at the Academic Medical Center who have made substantial contributions to the field of Internal Medicine through their scientific endeavors. In this Spotlight section, Abdullah Almayali provides a detailed account of his remarkable journey leading to this noteworthy recognition.

Can you provide a brief self-introduction and explain what drove your interest in research?

My name is Abdullah Almayali and I am pursuing a master's degree in medicine.

During my bachelor's degree, I found my inspiration for clinical research from the passionate professors who shared their life's work openly. Their dedication and enthusiasm highlighted how crucial research is in the medical field and motivated me to delve into this field myself. I decided to pursue the research minor within our faculty, aiming to deepen my understanding and start my very own research project. However, the journey had its share of challenges right from the start. I encountered various obstacles that eventually led me to halt my initial research project halfway through. Fortunately, an opportunity emerged when Prof. Dr. M. Boers and Dr. M. ter Wee offered me a new project, the official start of my research journey.

Could you tell us more about your research?

Professor Boers' GLORIA trial¹ focused on the use of low-dose prednisolone as long-term co-medication in rheumatoid arthritis. This piqued my interest, as during my training, I had only come to know prednisone as a potentially dangerous medication, something that doctors should generally avoid as much as possible or use as short as possible.

Since its introduction in 1950, prednisolone has had a significant impact. Initially hailed as a wonder drug providing relief within days, it also brought about serious side effects. Studies revealed the frequency of these side effects, but their quality was poor due to the retrospective or observational character.

Since then, there has been a reluctance among physicians, including rheumatologists, to use prednisolone. International rheumatology guidelines even consider it a mere temporary bridging therapy. Nonetheless, it remains indispensable in treating rheumatoid arthritis in clinical practice, with a substantial number of patients receiving chronic low doses due to its effectiveness.

The international, placebo-controlled GLORIA trial not only reaffirmed prednisolone's known efficacy but also demonstrated that its use does not carry an increased risk of severe side effects. These findings sparked my interest and made me realize that prednisolone indeed holds the potential to be used as a maintenance medication, contributing to patient well-being.

A crucial yet understudied aspect in this realm is medication tapering. It's associated with an elevat-

ed risk of disease flare-ups and even adrenal insufficiency. Methodologically grounded evidence has been lacking, and these very questions intrigued me during my research. Our findings indicated that these fears are unfounded and that the risk of disease flare-ups or adrenal insufficiency isn't as high as previously assumed.

When did you receive the award and what was the process behind it?

The Dr. I. Snapperprijs is an annual prize for an Amsterdam UMC student (bachelor's or master's) who has made a significant contribution to the field of Internal Medicine. This award is organized by the Ruitinga-Van Swieten Foundation to encourage research in this area. To be eligible, your supervisors need to nominate you. A selection committee subsequently evaluates all the potential candidates and selects a winner. I felt honored to be approached by Prof. Dr. Boers for this award and I am of course very grateful to win.

Do you have advice for upcoming medical students interested in research?

Naturally, you should select a subject that genuinely interests you; otherwise, the journey ahead could become long and tiring. Also, don't become disheartened when things don't initially go according to plan or if they're tough. It's your first time and that is normal. A common saying in the world of (data) science is "garbage in, garbage out," and this applies to your research too. If you don't fully commit to the project, don't be surprised when you don't get the results you hoped for. Last but not least, keep the syntax of your analyses from the start. This will save you time, trust me.

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Can less be more in the treatment of acute myeloid leukemia?

FARTUUN ALI¹ AND JACQUELINE CLOOS²

1. FACULTY OF MEDICINE, AMSTERDAM UMC, LOCATION VUUMC

2. DEPARTMENT OF HEMATOLOGY, AMSTERDAM UMC, LOCATION VUUMC



Acute myeloid leukemia (AML) is characterized by uncontrolled proliferation of hematopoietic precursor cells, leading to high levels of non-functional blasts in bone marrow and peripheral blood. AML is classified based on morphology, immunophenotype, and genetic abnormalities.¹ Based on genetics, AML types can have a favorable, intermediate, or adverse prognosis. The type of AML and the fitness of the patient decide the treatment the patient receives.¹ Standard treatment for an otherwise healthy patient consists of induction therapy involving 3 days of anthracycline and 7 days of cytarabine (“3+7”)² and consolidation therapy consisting of either an allogeneic stem cell transplantation (allo-SCT), additional cycle chemotherapy, or combination of high dose chemotherapy salvaged by an autologous-SCT (auto-SCT). Allo-SCT is associated with a lower risk of relapse. However, the chance of experiencing therapy-related morbidity such as graft-versus-host disease, is higher. As the quality of life (QoL) has become an important measure of therapy effectiveness³, for more favorable AML types, allo-SCT is often not the first choice of consolidation therapy, but in adverse cases, allo-SCT cannot be avoided. The best consolidation therapy in intermediate cases of AML is still debated. Measurable residual disease (MRD) assessment to detect persistent malignant cells after induction therapy, may ease decision-making.⁴ For MRD-positive intermediate-risk patients, allo-SCT should be performed, while for MRD-negative patients less intensive consolidation therapy could be considered. This latter option is controversial since some argue that you may deprive patients of the most curable treatment.⁵

In the study of Tettero et al.⁵, the researchers investigated the role of MRD in the treatment of intermediate-risk AML by comparing event-free survival (EFS) and overall survival (OS) of MRD-nega-

tive patients who received less intensive consolidation therapy consisting of auto-SCT or third cycle of chemotherapy, with those who received an allo-SCT. No significant differences were found between the two groups (EFS: HR 0.69; 95%CI, 0.37-1.29; p= 0.24 & OS: HR, 1.24; 95%CI, 0.59-2.63; p= 0.57). Thus, allo-SCT treatment did not lead to better outcomes in MRD-negative patients, which was corroborated by comparison of the guided cohort with a historical non-guided cohort using propensity-matched scoring analysis. To unequivocally prove that de-intensification of treatment can be done safely without jeopardizing survival, a large European randomized trial will be performed including extensive analysis of QoL. The result of such a specifically designed trial should be able to convincingly show if “less is more” in the treatment of intermediate-risk AML.

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Answers 'Acute leg pain during the running of a marathon in a female patient'

MATTHIJS J. VAN EE AND PROF. DR. MARIO MAAS



Correct answers: 1B, 2A, 3C, 4D

EXPLANATION

In this case, the diagnosis points to a posteromedial stress fracture in the left lower tibia. This type of stress fracture is primarily caused by repetitive forces, as seen here in the context of long-distance running. Repeated mechanical loading leads to the development of microcracks that surpass the bone's regenerative capacity. Consequently, this explains why the pain associated with a stress fracture worsens over time.¹

The X-ray images clearly depict posteromedial tibial fractures, indicated by arrows.

Although both posterior tibial tendonitis and medial tibial stress syndrome relate to running and repetitive impact activities, the symptoms in this particular case, which progressed from increasing pain to acute pain, along with the X-ray findings, align more with a stress fracture than inflammation. Posterior tibial tendonitis involves ankle tendon inflammation, while medial tibial stress syndrome affects the tibia's inner edge.²

Recovery from this condition can last up to 8 weeks; it is essential to allow the bone adequate time to heal. The recommended approach is to prioritize rest, icing the injured area for pain and swelling reduction, and gradual progress to non-weight-bearing activities after a resting period.

To prevent future stress fractures, important pre-

cautionary measures encompass appropriate footwear, a well-balanced diet, and a gradual activity increase.¹

When dealing with recurring stress fractures or ongoing injuries, it is worth considering the concept of RED-S (also referred to as the Female Athlete Triad). This condition encompasses three distinct clinical aspects: disordered eating, menstrual dysfunction, and low bone mineral density. Disordered eating patterns can result in insufficient calcium intake, which can contribute to bone loss. Having lower bone density places you at a heightened vulnerability for fractures.^{3,4}

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Answers 'More Than Meets the Eye: diving deeper into skin lesions'

YASSMINA DERRAZE AND JURRIEN STIEKEMA



Correct answers: 1C, 2B, 3D

EXPLANATION

Question 1

Dermatofibrosarcoma protuberans (DFSP) is an uncommon sarcoma that originates in the dermal layer of the skin.¹ It is characterized by an aggressive infiltration into surrounding tissues and a notable tendency for local recurrence. The challenge arises from its ability to mimic benign growths such as dermatofibroma, lipoma, or epidermoid cysts. The exact causes and risk factors are not fully understood. Nevertheless, there have been reports linking DFSP with areas of trauma or scarring.²

Question 2

DFSP tumorigenesis is associated with the COL1A1-PDGFB fusion gene. This genetic alteration is associated with a significant risk of local recurrence and metastasis.²

Question 3

The mainstay of treatment for DFSP is wide local excision (WLE) with histologically negative margins.^{1,2} Negative margins indicate that there are no cancer cells found at the edge of the tissue that was removed. In this case, after resection, the patient received a vacuum-assisted closure (VAC) on the wound to decrease pressure and promote wound healing. In general, the recurrence rate is around 50% within three years, with a 10-year survival rate of 99.1%. Systemic therapy is only considered for large tumors in cosmetically sensitive locations or metastatic disease as these areas often surpass the typical risk of metastasis.¹

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Answers 'A life-threatening skin condition'

MARJOLEIN A. KEESEBERG AND NIEK H. SPERNA WEILAND



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Correct answers: 1D, 2B-D-E-F, 3A

EXPLANATION

Question 1

Maybe when you first saw the picture you thought of Stevens-Johnson Syndrome. Stevens-Johnson Syndrome is a skin condition formerly grouped under erythema exsudativum multiforme (EEM) major. However, this is considered a different syndrome. The syndromes are mainly separated by the percentage of the skin that is affected:

- <10%: Stevens-Johnson Syndrome (SJS)
- 10-30%: overlapping syndrome Stevens-Johnson Syndrome with Toxic Epidermal Necrolysis (TEN)
- >30%: Toxic Epidermal Necrolysis

So if more than 30% of the skin and 2 or more mucous membranes are affected, we speak of TEN. TEN is a rare and life-threatening disease that is almost always caused by medication (80% of cases). It can be accompanied by sepsis, multi-organ failure, pulmonary embolisms, and gastrointestinal bleeding. Graft versus host disease after a bone marrow transplant can cause a similar clinic, but the patient did not have a transplant. Bullous toxicoderma shows more of a maculopapular exanthema. SLE can in 0,07% of cases express as TEN-like SLE, so this answer could also have been an option, but not the most likely one.¹

Question 2

Medication notoriously known to cause TEN includes sulfonamides antibiotics (mostly trimethoprim, sulfamethoxazole), anti-epileptics (carbamazepine, fenytoin, phenobarbital), β -Lactam antibiotics, antiretroviral medication (nevirapine, abacavir), NSAIDs (mostly oxicams), allopurinol, lamotrigine, tetracyclines, chinolones (mostly ciprofloxacin). The most important part of the treatment is to stop the medication responsible and to switch to a different medicine.¹

Question 3

Mortality of TEN is about 25-35%. For the patients' prognosis an early diagnosis is important. That way the medicine that causes the TEN can be identified and discontinued as quickly as possible. A scoring system, the SCORTEN scale, with certain risk factors aims for a more specific prognosis.¹

RISK FACTOR (SCORTEN SCALE):	0	1
Age	<40 years	>40 years
Associated malignancy	no	yes
Heart rate (beats/min)	<120	>120
Serum BUN (mmol/L)	<10	>10
Detached or compromised body surface	<10%	>10%
Serum bicarbonate (mEq/L)	>20	<20
Serum glucose (mmol/L)	<14	>14

NO OF RISK FACTORS:	MORTALITY RATE:
0-1	3.2%
2	12.1%
3	35.3%
4	58.3%
5 or more	>90%

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About the cover

The cover shows a picture of a glioblastoma (GBM) under the microscope with dyes. GBM is the most common malignant brain tumor in adults. In 2021 a team at the Brain Tumor Research Centre of Excellence at Queen Mary University of London discovered new insights into how GBM develops, and with it, identifying potential new targets for individualized treatment.

You can read more about it in the article published in *Nature communications* called 'Comparative epigenetic analysis of tumor initiating cells and syngeneic EPSC-derived neural stem cells (SYNGN) in glioblastoma' by Vinel et al.¹

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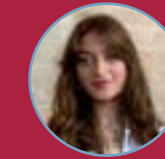
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