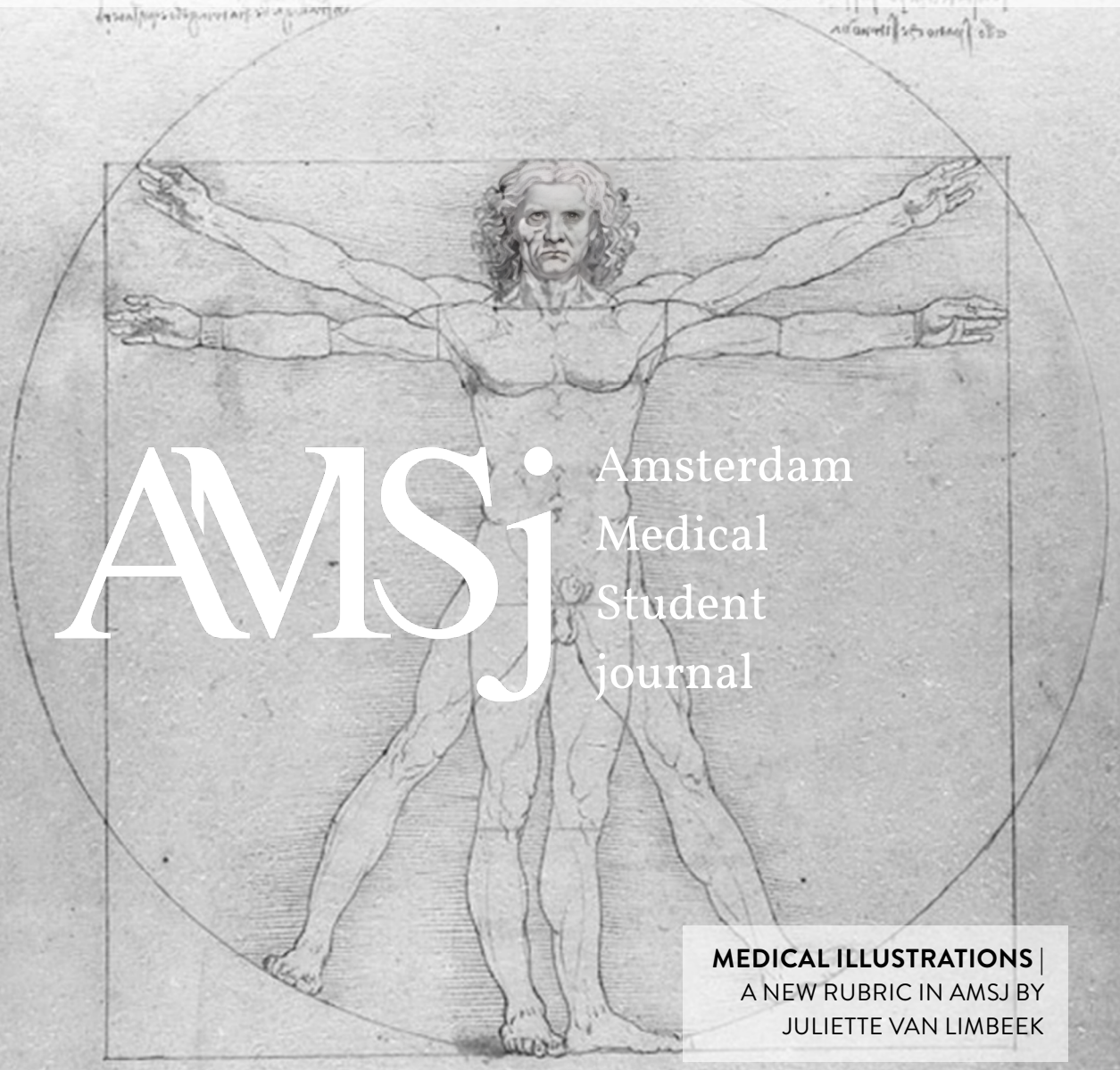

AMSj

Amsterdam Medical Student journal

MEDICAL ILLUSTRATIONS |
A NEW RUBRIC IN AMSJ BY
JULIETTE VAN LIMBEEK

CHANGING PERSPECTIVES |
RECONSIDERING PAIN MANAGEMENT FOR IUD PLACEMENT: IS IT TIME TO STANDARDISE LOCAL ANAESTHETICS?

EDITION 36 | DECEMBER 2024

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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,

Welcome to Edition 36. Before highlighting the contents of this edition, I would like to share some thoughts. Since 2015, AMSj has been founded and grown thanks to the efforts of many talented editors and reviewers, most of whom have advanced their careers in the academic medical field. The initiative of AMSj is unique in its collaboration between two university medical centers in Amsterdam, which predates the current Amsterdam UMC. One of the two founders and the former Editor-in-Chief of AMSj, Jeske van Diemen, shared her journey and thoughts with us in Retrospect AMSj on page 3.

The difference in clinical outcomes between men and women has received significant attention and is now incorporated into the design of cardiovascular trials. Notably, major randomized trials are now dedicated to a women-only population. This attention has been reflected in new guidelines. Non-obstructive coronary artery disease disproportionately affects women. Geldof et al. discussed the latest guideline update on chronic coronary syndromes, including diagnostic and management approaches for non-obstructive coronary artery disease. Read more on page 11.

Seeratan et al. discussed the use of analgesics for intrauterine device placement. Online media platforms have reinforced the narrative that most guidelines were historically written by men, reflecting the gender imbalance in academia, while the women's rights movement advocates for control over one's own body. Is it time to change the perspective? Read more on page 29.

Medical illustration is an essential part of the journal, as it enhances readers' understanding of the main message of the text. On page 18, Juliette van Limbeek, our medical illustrator, formally introduces herself and shares her journey into this art form. Her work will be released in upcoming editions, and her illustration of Tetralogy of Fallot is already featured on page 19.

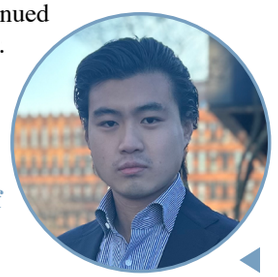
The Lustrum Nicolaes Tulp Symposium was the highlight of the year for AMSj, hosted at Huis Vasari and co-managed by two talented AMSj board members, Suzanne Veen and Harun Osmani. The event truly embodied the spirit of AMSj as a platform for talents to communicate their scientific findings to the audience. This year, Roos Frölke was awarded the AMSj prize for her research in the diagnostics for leptospirosis and scrub typhus. Read on page 4.

Lastly, I would like to thank David Vecht, who has just reviewed his final AMSj edition as Content Editor. He joined AMSj in 2020, and has played a crucial role in providing valuable feedback to both reviewers and authors. I wish him all the best in his future career, though he won't be leaving us just yet, as he will be leading The Expert's View with Diederik Gommers.

AMSj is built on the dedication and expertise of our authors, reviewers, and editorial board members. Thank you to everyone involved in this issue, it would not be possible without your hard work and commitment. I encourage our readers to explore the content of this edition, share your thoughts, and consider submitting your own work to AMSj. If you have further inquiries, feel free to reach out to us.

Thank you for your continued support. Happy new year.

With warmest regards,



Bobby Lam
Student Editor-in-Chief
Amsterdam UMC,
location AMC

Retrospection

Jeske van Diemen[1]
1 Former Editor-in-Chief and Co-Founder of the Amsterdam Medical Student journal

As I sit down to write this piece, a rush of memories floods my mind. The journey of founding the Amsterdam Medical Student journal (AMSj) was both exhilarating and humbling, a testament to the power of collaboration and passion among medical students from two separate universities. Reflecting on the path we have taken, I am filled with pride and nostalgia.

> "Reflecting on the path we have taken, I am filled with pride and nostalgia"

When we started AMSj, our vision was clear: to create a platform where medical students could share their research, insights, and diverse perspectives. One of the most rewarding aspects of my role was witnessing the transformation of contributors. Many students, initially unsure of their writing abilities, blossomed into confident authors, their articles sparking discussions and inspiring others. Hence, a journal where every submission became a celebration of the hard work and creativity of our peers.

> "When we started AMSj, our vision was clear"

The intersection of academic work, which began at the AMSj, and clinical responsibilities has been a recurring theme of my internal medicine residency journey. One where you constantly seek to integrate and weigh the latest evidence into practice. The AMSj taught me that the evidence is, more often than not, far from perfect. Hence, medicine is not merely about treating diseases according to the latest guideline; it's about remaining attuned to the individual narratives of the patients, understanding people, and weighing the various options there might be. That understanding is essential in internal medicine, where the complexities of human health often mirror the intricacies of medical literature.

To my fellow alumni and current students, remember that the journey of medicine is as much about collaboration as it is about individual achievement. The ongoing exchange of ideas and knowledge has reinforced my belief that medicine is not only a scientific endeavor but a collaborative one. Stay curious, stay engaged, and never underestimate the power of your voice!

With warmest regards,

Jeske van Diemen
Former Editor-in-Chief

Breaking the silence: towards better recognition of leptospirosis and scrub typhus in sepsis patients

Roos Frölke[1]
1 Winner of the AMSj Onderzoeksprijs at the Lustrum Nicolaes Tulp Symposium

My name is Roos Frölke, and I am a medical master's student at the Amsterdam UMC, University of Amsterdam. On November 12th, I had the privilege of participating in the Nicolaes Tulp Symposium, where I presented my Wetenschappelijke Stage (scientific internship) research: "Breaking the silence: towards better recognition of leptospirosis and scrub typhus in sepsis patients", as a finalist for the AMSj Onderzoeksprijs. It was an inspiring evening, full of interesting presentations and lively discussions. To my great excitement, I was awarded the AMSj Onderzoeksprijs at the end of the event!

Due to my interest in tropical infectious diseases, I had the pleasure of completing my scientific internship last year at the Centre of Experimental and Molecular Medicine under the supervision of Prof. Dr. Joost Wiersinga and Drs. Jason Biemond. My research project is part of the MARS-India study (Molecular Diagnosis and Risk Stratification of Sepsis in India), which sheds light on a large ICU sepsis cohort in Manipal, India. We discovered that leptospirosis and scrub typhus are surprisingly frequent causes of sepsis in our cohort. We described the clinical characteristics and outcomes of these patients. Furthermore, we developed preliminary prediction models using clinical data to identify leptospirosis and scrub typhus patients early, potentially enabling targeted interventions to improve outcomes. Laboratory tests often take a long time, emphasising the importance of early identification.

Since I review the Solving Epidemiology section for AMSj with Dr. Sharon Remmelzwaal, I thought it might be fun and educational to highlight one of the methods we used to evaluate our prediction models: the "confusion matrix". True to its name, this tool often causes confusion, but it's invaluable for assessing model performance. It is a straightforward and powerful tool for analyzing how well a model performs by breaking down its predictions into true positives, true negatives, false positives, and false negatives. This allows us to assess specific metrics like sensitivity, specificity and predictive values. Using ROC-AUC curves, we demonstrated that our models perform reasonably well in predicting leptospirosis and scrub typhus, achieving an AUC of 0.77 based on clinical data. When we analyzed the utility of these models with a confusion matrix, we found that our models had high negative predictive values (NPVs), meaning they were particularly effective at ruling out leptospirosis and scrub typhus early. This is an important finding because it suggests we could avoid costly and time-consuming lab tests for many patients in resource poor regions. However, the confusion matrix also revealed a high No Information Rate (NIR)—90% for leptospirosis—which means that simply predicting "no disease" based on its prevalence would be correct 90% of the time without using the prediction model. This highlights a key limitation: we concluded that clinical data alone is too nonspecific to reliably predict these diseases and that the heterogeneity of sepsis makes it challenging to develop robust prediction models. Nonetheless, tools like the confusion matrix help us assess model performance, which may offer far more insight than the ROC-AUC curves. Since clinical data alone isn't sufficient for reliable prediction models, we're moving on to more extensive measurements: biomarkers. Hopefully, I'll be able to tell you more about that in the future... maybe even live from India!

WHAT'S NEW

Extracorporeal cardiopulmonary resuscitation versus standard treatment for refractory out-of-hospital cardiac arrest: a Bayesian meta-analysis

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The usage of extracorporeal cardiopulmonary resuscitation (ECPR) versus conventional CPR (CCPR) in refractory out-of-hospital cardiac arrest (OHCA) has been investigated in several randomized controlled trials (RCTs), using concepts like the null-hypothesis and p-values in pooled analyses. However, such analyses are dependent on sample sizes and event rates. The authors have decided to perform a Bayesian meta-analysis to compare the usage of ECPR and CCPR in OHCA to determine a clinically relevant effect. Bayesian analysis is an upcoming technique that combines prior knowledge with new data to update the probability of a hypothesis being true. This analysis provides probabilities of hypotheses rather than p-values. Prior distributions and likelihoods of observed data are utilized to create posterior distributions, offering a comprehensive view of effect size uncertainty with credible intervals.

After thorough screening, three studies remained eligible for analyses. These trials resulted in a total of 420 patients (ECPR: 209 and CCPR: 211), focusing on 6 month neurologically favorable survival. Bayesian analysis in this study revealed a median relative risk (RR) of 1.47 (95% credible interval 0.73-3,32) for all rhythms and 1.54 (95% credible interval 0.79-3.71) for shockable rhythms. The study showed a 71.1%-75.8% posterior probability of ECPR providing a clinically relevant survival improvement with an 8.7-10.8% absolute risk difference in favor of ECPR. The findings suggest potential neurological benefits for ECPR in refractory OHCA over CCPR in especially skilled medical centers. The Bayesian analysis highlights the importance of including probability distributions in clinical decision-making, providing a more detailed understanding of treatment effects.

1. Heuts S, Ubben JFH, Kawczynski MJ et al. Extracorporeal cardiopulmonary resuscitation versus standard treatment for refractory out-of-hospital cardiac arrest: a Bayesian meta-analysis. Critical Care. 2024;28(1):217.

Inspire other students! Have you done an ineresting research internship and do you want to show your results? Publish you original article, systematic review or case report in AMSj. See guidelines for submitting an article on www.amsj.nl

AMSj

Additional cohort studies useful to evaluate screening programs

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Clinical trial results are considered the most reliable evidence. However, trials often include healthier patients than those seen in real-world settings. Additional cohort studies are needed to assess the effects of an intervention in a population that better reflects the average population. This is demonstrated by results from a retrospective study that evaluated the United States national lung cancer screening program in a representative cohort from the same country. Compared to the National Lung Screening Trial (NLST), this study reported higher (30,6% (95% CI 23.8-37.3) vs 17,7% (95%CI 15.4-19.9)) and more major (20,6% (95%CI 14.7-26.5) vs 9,4% (95%CI 7.6-11.1)) complication rates as a result of invasive procedures following low dose CT screening.[1] The major complication rates included 20 types, such as death and myocardial infarction.[1] The difference in complications was attributed to older patients with more comorbidities and current smokers in the cohort study.1 The current U.S. program is largely based on the NLST, which demonstrated that screening could lead to 20% reduction in lung cancer specific mortality.[1] This cohort study emphasizes the need to balance screening benefits and risks. In addition, a decrease in cancer-specific mortality may not necessarily reflect an improvement in overall survival, which increases the importance of understanding the possible harms of cancer screening programs.

1. Rendle KA, Saia CA, Vachani A, Burnett-Hartman AN, Doria-Rose VP, Beucker S, et al. Rates of downstream procedures and complications associated with lung cancer screening in routine clinical practice : A retrospective cohort study. Ann Intern Med. 2024;177(1):18–28.

My knight in shining helmet; a lower rate of head injuries in bicycle-related accidents

Elise Beijer[1] and Fay R.K. Sanders[2]
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Bicycling: it is something that cannot be ignored here in the Netherlands. Whether you are young or old, live in the countryside or city, we are all familiar with (e-)bicycling. Let's dive into helmet use: is there any added value?

Næss et al[1] recently published a study involving prospectively included trauma patients with bicycle-related injuries at a level 1 Norwegian trauma centre. During a 12-year study period, 1256 bicyclists were included who were treated by the hospital's trauma team within 24hours of injury with an Injury Severity Score >10 (scale 1-75), Head Abbreviated Injury Score >3 (scale 1-6) and/or specific penetrating injuries. Head injury, cranial neurosurgical procedures and mortality were compared in helmeted and non-helmeted patients. Helmeted bicyclists (54%) showed lower rates of any head injury (56% vs. 77%, p<.001), mild to moderate (34% vs. 39%, p<.001), serious head injury (22% vs. 38%, p<.001) and cranial neurosurgical procedures (3.2% vs. 14%, p<.001). No statistically significant mortality difference was found (1.5% vs. 2.9%, p=.08). The helmeted bicyclist compared to non-helmeted injured bicyclist was typically a bit older, crashed during daytime and presented with higher consciousness measured by Glasgow Coma Scale score.

Moreover, the authors stress the burden of bicycle-related traumatic brain injury (TBI) to society, besides the impact on the lives of affected patients. Prevention is key. They point out low helmet use in the Netherlands (4.4-7.7%), and the yearly estimated reduction rate of deaths and TBI cases to be 46 and 2942 respectively if law enforcing helmet use were introduced.

In summary, the authors conclude that helmets protect: helmeted bicyclists had reduced incidence of head injury for all head injury severities and underwent fewer cranial neurosurgical procedures. Therefore authorities should consider measures to improve helmet use.

1. Næss I, Døving M, Galteland P, et al. Bicycle helmets are associated with fewer and less severe head injuries and fewer neurosurgical procedures. Acta Neurochir (Wien). 2024 Oct 9;166(1):398

ENDOCRINOLOGY

Excess Cortisol may be a bigger problem than we thought

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2 MD PhD-Student, Department of Endocrinology and Metabolism, Amsterdam UMC Location AMC

Endogenous Cushing's syndrome (CS), a rare endocrine disorder caused by prolonged cortisol elevation, is associated with metabolic, cardiovascular, and immune dysfunction. It primarily arises from Cushing's disease (CD), driven by ACTH-secreting pituitary adenomas (60–70%), but can also stem from adrenal aetiologies (20–30%) or, rarely, ACTH-secreting tumors elsewhere. Cancer accounts for 10.6% of deaths in CS patients, underscoring its clinical importance. In addition, despite numerous identified risk factors for cancer, the association of endogenous CS and cancer incidence remains unexplored.

This retrospective matched cohort study investigates the link between CS and malignancies. In this study, only pituitary and adrenal-origin CS cases were included to ensure robust data. 609 patients with CS were analyzed against 3018 matched controls in a 14.7-year follow-up. The primary outcome was the first diagnosis of any malignancy following a CS diagnosis. Cox proportional hazard models, adjusted for competing risks, revealed a 78% increased cancer risk in CS patients (HR 1.78; 95% CI, 1.44–2.20), particularly for thyroid, adrenal, gynecological, and genitourinary cancers. Sensitivity analyses confirmed these findings by addressing biases, excluding patients with prior cancer, early follow-up years, ectopic CS-related tumors, or thyroid cancer. Elevated cancer risk persisted (HRs range 1.55–1.88). Causes for this may be that excessive cortisol weakens anti-tumor immunity by suppressing immune cells and thus promoting a tumor-friendly environment. Furthermore, the elevated cancer risk in CS patients may stem from cortisol-related comorbidities like obesity, insulin resistance, and diabetes.

These results highlight the role of hypercortisolism in tumor development, underscoring the need for early CS detection and personalized cancer screening to improve outcomes.

1. Rudman Y, Fleseriu M, Dery L, et al. Endogenous Cushing's syndrome and cancer risk. Eur J Endocrinol. 2024;191(2):223–31. Available from: https://doi.org/10.1093/ejendo/lvae098

PEDIATRICS

The launch of the R21 malaria vaccine in South Sudan

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2 Department of Gynaecology, Haaglanden Medical Center The Hague, The Netherlands

Malaria is one of the most lethal diseases in the African region, especially under the age of five years. In 2022, South Sudan was ranked among the 22 highest burden of malaria countries worldwide. For a country that has faced significant challenges since its independence in 2011 (civil war, natural hazards, poverty), battling malaria is a major public health challenge. According to the World Health Organization (WHO), South Sudan reported 7630 new cases and 18 deaths daily.[1]

After the success of the first malaria vaccine (RTS,S/AS01), the WHO recommends both the RTS,S/AS01 vaccine and the new R21/Matrix-M vaccine in children. The RTS,S/AS01 is a lyophilized injection given intramuscularly. The vaccines are proven to be safe and effective.[1] The R21 vaccine showed 75% efficacy at 12 months after injection, along with a good toleration.[2]

Last summer, the R21 vaccine was launched in South Sudan, which is a major milestone in the malaria elimination program. Together with the RTS,S vaccine, this vaccine will most likely benefit child mortality and morbidity. The launch of the R21 vaccine in South Sudan is a game-changer and a significant step forward in the goal of the WHO to reduce malaria cases by 90% in 2030.[1,3]

1. South Sudan Launches R21 Malaria Vaccine Rollout to Protect Children [Internet]. Unicef.org. 2024. Available from: https://www.unicef.org/southsudan/press-releases/south-sudan-launches-r21-malaria-vaccine-rollout-protect-children
2. Datoo MS et al. Safety and efficacy of malaria vaccine candidate R21/Matrix-M in African children: a multicentre, double-blind, randomised, phase 3 trial. The Lancet. 2024 Feb 1;403(10426).
3. Media team W. Shipment of Newest Malaria vaccine, R21, to Central African Republic Marks Latest Milestone for Child Survival [Internet]. www.who.int. 2024. Available from: https://www.who.int/news/item/24-05-2024-shipment-of-newest-malaria-vaccine--r21--to-central-african-republic-marks-latest-milestone-for-child-survival

Renal Cell Carcinoma in a Patient with a history of Breast Cancer

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2 Department of Radiology and Nuclear Medicine, Amsterdam UMC, location AMC

CASE

A 65-year-old female with a history of type 2 diabetes, arthrosis and recently diagnosed breast cancer (cTisN1M0), had an incidental finding on her PET scan: a cyst in the left kidney. A subsequent CT-scan revealed a 3.4 cm mass in the kidney, classified as a cT1aN0M0 renal cell carcinoma (RCC).
While chemotherapy had already been started for the breast cancer, RCC does not respond well to chemotherapy. The decision was made to focus on treating the breast cancer and postpone RCC treatment.

QUESTION 1

What is the standard treatment for RCC?

A. Surgical resection
B. Targeted therapy
C. Immunotherapy

QUESTION 2

What is not a common metastatic site of a primary breast tumor?

A. Lungs
B. Liver
C. Kidneys

QUESTION 3

Imaging described the RCC as: "an exophytic lesion with central hypodensity and arterial enhancement of the wall." (FIGURE 1)
Which of these reported properties is most concerning regarding the prognosis?

A. Exophytic growth
B. Arterial enhancement
C. Central hypodensity

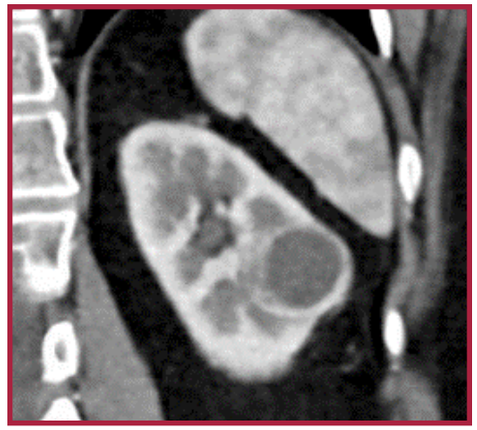

FIGURE 1 Coronal view of the CT-scan in the arterial phase. The RCC protrudes to the lateral side of the left kidney, right beneath the spleen.

Answer on page 27

The Double-Edged Diagnosis

Ceren Bulut[1] and Astrid van Huizen[2]
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CASE

A 1-year-old boy was referred to the dermatologist due to persistent skin problems that have been present since birth. At birth, his skin was very dry and flaky, especially around the hand palms and soles of the feet. These flakes seem to have double-edged outlines, similar to the image below. The parents report that the patient frequently suffers from asthma and eczema.

QUESTION 1

Based on the clinical image and description, which diagnosis is most likely the case for this patient?

A. Netherton syndrome
B. Atopic eczema
C. Congenital lamellar ichthyosis
D. Erythema annulare centrifugum

QUESTION 2

A mutation in which gene causes this syndrome?

A. COL7A1-gene
B. SPINK5-gene
C. EDA-gene
D. FLG-gene

QUESTION 3

Which treatment is not suitable for patients with this syndrome?

A. Antibiotics
B. Moisturizers
C. Biologics
D. Topical corticosteroids

Answer on page 28

A 'cold' skin condition

Johanna da Silva Voorham[1] and Anna Emanuel[2]
1 Faculty of Medicine, Amsterdam UMC, location AMC, The Netherlands
2 Department of Internal Medicine, Amsterdam UMC, The Netherlands

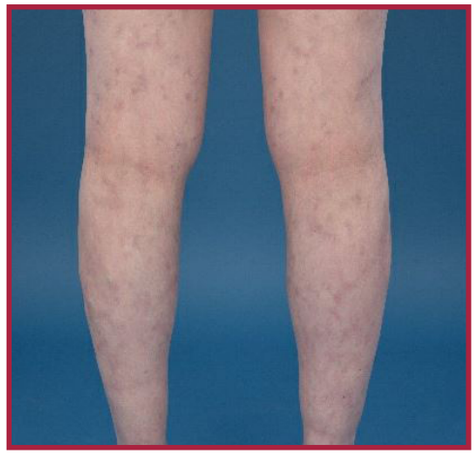
CASE

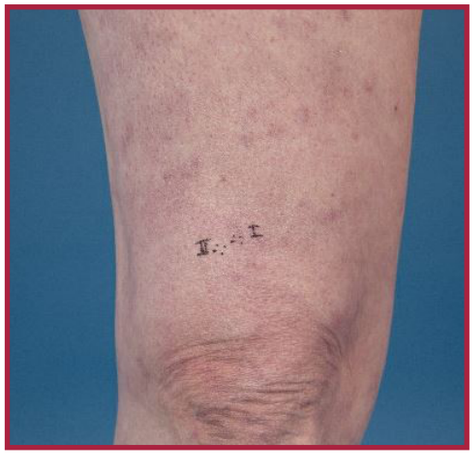
A 56-year old female presents with a skin condition (as shown in the picture) on her trunk, arms and legs. Her medical history includes rheumatoid arthritis for which she uses plaqunil and leflunomide (DMARDs). The discoloration occurs more in cold conditions and diminishes but does not disappear after warming up. In addition she suffers from weight loss (6kg in 5 months), night sweats, energy loss, Raynaud phenomenon and polyneuropathy. Physical examination reveals an irregular and discontinuous pattern of cyanotic discoloration without wounds.

QUESTION 1

Based on the skin condition and clinical presentation what the most likely diagnoses?

A. Livedo Reticularis/Cutis marmorata
B. Livedo vasculopathy
C. Livedo racemosa
D. Cutis marmorata telangiectatic congenita





Answer on page 28

Updated guideline for the management of chronic coronary syndromes

Nadine I. Geldof[1] and Pepijn A.A. van Diemen[2]
1 Faculty of Medicine, Amsterdam UMC, Location AMC
2 Department of Cardiology, Amsterdam UMC, location VUmc

A substantial proportion of patients presenting with symptoms of angina pectoris have non-obstructive coronary arteries (ANOCA), with the prevalence of ischemia with non-obstructive coronary arteries (INOCA) ranging from 10% to 30%. The mismatch between myocardial blood supply and oxygen demand in ANOCA and INOCA may be caused by chronic microvascular disease and/or epicardial coronary artery spasm. Misdiagnosis in these patients can lead to incorrect treatment and adverse cardiovascular outcomes. Therefore, it is important that the diagnosis and management of ANOCA/INOCA patients is optimized.

The European Society of Cardiology (ESC) recently updated its guidelines on chronic coronary syndromes, introducing new and revised recommendations regarding the diagnosis and management in ANOCA/INOCA patients.

Regarding the diagnosis of ANOCA/INOCA patients, the ESC guideline provides a diagnostic algorithm for identifying different endotypes, including endothelial- and microvascular dysfunction and vasospastic angina, enabling targeted treatment. This algorithm describes initial evaluation starting with non-invasive tests, such as positron emission tomography, MRI, stress echocardiography, single-photon emission computed tomography, and coronary computed tomography angiography. If ANOCA/INOCA is still suspected and symptoms persist, invasive tests can be used, including coronary flow reserve (CFR), fractional flow reserve (FFR), instantaneous wave-free ratio (iwFR), microcirculatory resistance measurements, and intracoronary acetylcholine administration.

Recommendations in 2019 version	Class[a]	Level[b]	Recommendations in 2024 version	Class[a]	Level[b]
Guidewire-based CFR and/or microcirculatory resistance measurements should be considered in patients with persistent symptoms, but coronary arteries that are either angiographically normal or have moderate stenoses with preserved iwFR/FFR.	IIa	B	In persistently symptomatic patients despite medical treatment with suspected ANOCA/INOCA (i.e. anginal symptoms with normal coronary arteries or non-obstructive lesions at non-invasive imaging, or intermediate stenoses with normal FFR/iFR at coronary arteriography) and poor quality of life, invasive coronary functional testing is recommended to identify potentially treatable endotypes and to improve symptoms and quality of life, considering patient choices and preferences.	I	B
Intracoronary acetylcholine with ECG monitoring may be considered during angiography, if coronary arteries are either angiographically normal or have moderate stenoses with preserved iwFR/FFR, to assess microvascular vasospasm.	IIb	B			

TABLE 1 Revised recommendations regarding diagnosis of patients with angina/ischaemia with non-obstructive coronary arteries[1]

Management of ANOCA/INOCA		
In symptomatic patients with ANOCA/INOCA, medical therapy based on coronary functional test results should be considered to improve symptoms and quality of life.	IIa	A
For the management of endothelial dysfunction, ACE-I should be considered for symptom control.	IIa	B
For the management of microvascular angina associated with reduced coronary/myocardial blood flow reserve, beta-blockers should be considered for symptom control.	IIa	B
For the treatment of isolated vasospastic angina:	I	A
• calcium channel blockers are recommended to control symptoms and to prevent ischaemia and potentially fatal complications;		
• nitrates should be considered to prevent recurrent episodes.	IIa	B
In patients with evidence of overlapping endotypes, combination therapy with nitrates, calcium channel blockers, and other vasodilators may be considered.	IIb	B

TABLE 2 New recommendations regarding management of ANOCA/INOCA[1]

Previously, the 2019 ESC guideline stated a class IIa and IIb recommendation for guidewire-based CFR, microcirculatory resistance testing, and intracoronary acetylcholine administration in patients with persistent symptoms, but normal or moderate stenosis with preserved iwFR/FFR. The updated 2024 ESC guideline elevates the use of invasive coronary functional testing to a class I recommendation. TABLE 1 shows a detailed overview of the revised recommendations regarding diagnosis of ANOCA/INOCA patients.

Regarding management of ANOCA/INOCA patients, the ESC 2024 guideline states that medical therapy for symptomatic ANOCA/INOCA patients based on coronary function tests should be considered to improve symptoms and quality of life (class IIa). ACE inhibitors should be considered for endothelial dysfunction, and beta-blockers should be considered for microvascular angina with reduced coronary/myocardial flow reserve (class IIa). Moreover, calcium channel blockers (CCBs) and nitrates are recommended for isolated vasospastic angina (class I and class IIa). Finally, in patients with overlapping endotypes, combination therapy with nitrates, CCBs, and other vasodilators may be considered (class IIb). TABLE 2 shows a detailed overview of all new recommendations for managing ANOCA/INOCA patients.

This article outlines the revised and new recommendations for diagnosis and management of ANOCA/INOCA patients. For all other recommendations regarding chronic coronary syndromes, please consult the 2024 ESC guideline.

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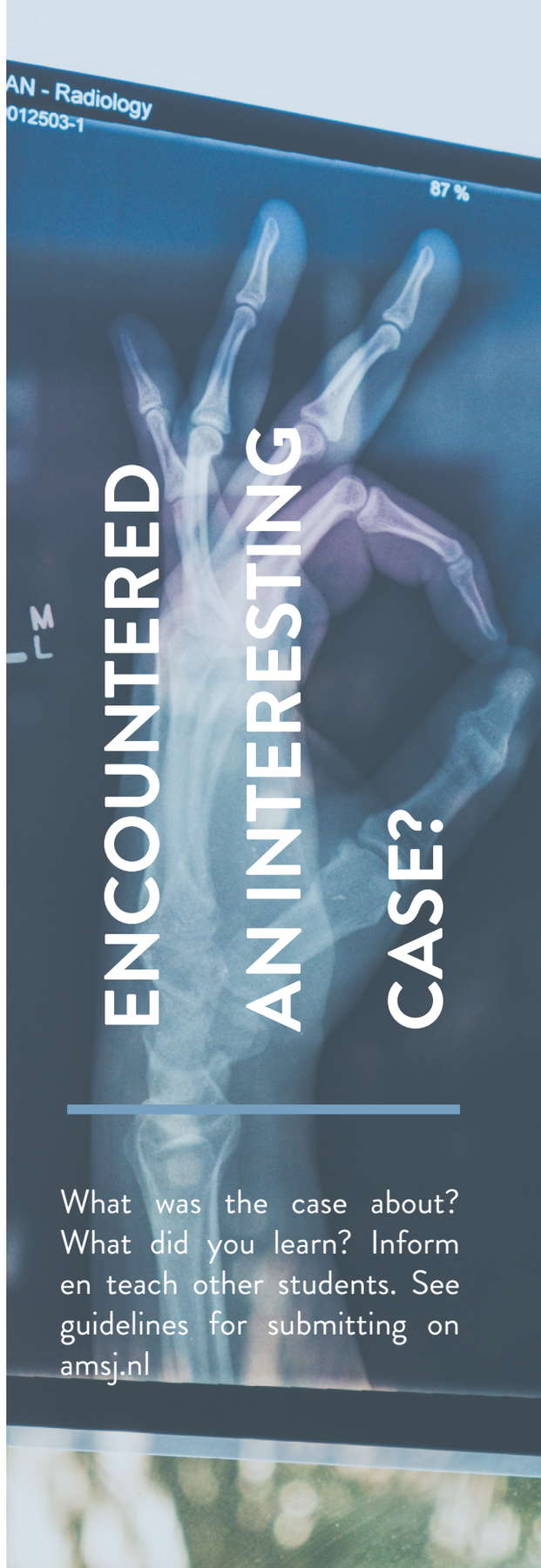

Isoniazid: the antibiotic that is also a MAO-inhibitor

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2 Kenniscentrum Geneesmiddelenonderzoek, Amsterdam UMC, location VUmc

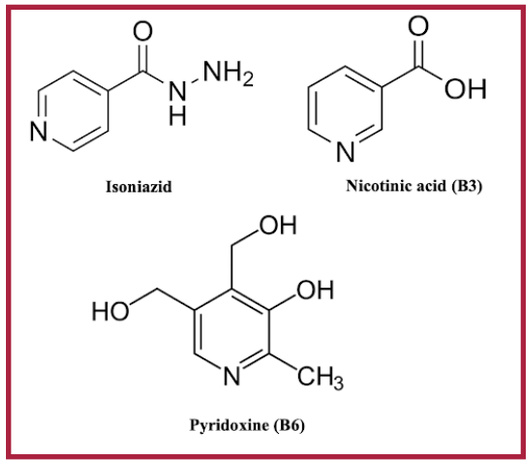

FIGURE 1 isoniazid, nicotinic acid and pyridoxine have similar structures

One of the first discovered pharmaceutical treatments for depression was isoniazid (isonicotinic acid hydrazide, INH).[1] This tuberculostatic drug is, in fact, a monoamine oxidase inhibitor (MAOi). Its use as a psychostimulant was discontinued in 1961 due to significant liver toxicity as a side effect. Nevertheless, its antibiotic benefits outweighed the hepatotoxic risks, and this old drug remains a cornerstone in the eradication of Mycobacterium tuberculosis. Active tuberculosis is typically treated with a first-line regimen consisting of four compounds: rifampicin, isoniazid, pyrazinamide, and ethambutol.[2] The rationale behind this combination is to prevent the rapid development of resistance that could occur if a single drug were used in isolation. The acronym "RIPE" serves as a helpful mnemonic, though it should be noted that the last two drugs (PE) are only used during the first two months, while RI treatment continues for a full six months. Isoniazid, however, can also be used alone for prophylaxis, particularly in immunocompromised patients who have been in contact with individuals with open tuberculosis.

Like pyrazinamide and ethambutol, isoniazid is characterized by its small molecular weight and relatively low hydrophilicity compared to most antibiotics. This property enables extensive tissue distribution and, crucially, allows the drug to accumulate in the lipid-rich caseous granulomas of infected patients.[3] These granulomas harbor encapsulated mycobacteria. Furthermore, isoniazid readily penetrates the bacterial cell wall, which is composed of mycolic acids. Mycolic acids are essential for bacterial growth within macrophages and provide a protective shield against the immune system, making them critical for the survival and proliferation of mycobacteria. Isoniazid acts as a prodrug that resembles both niacin (vitamin B3) and pyridoxine (vitamin B6) (figure). Activation occurs via KatG, a bacterial enzyme that converts isoniazid into free radicals.[4] One of these radicals binds to bacterial NAD+, forming an adduct that inhibits fatty acid synthase 1, the enzyme responsible for elongating mycolic acids. As a result, isoniazid is tuberculostatic and only acts on dividing bacteria, though it can be bactericidal at high doses.

The free radicals generated during this process also contribute to hepatotoxicity, with transient elevations in transaminases considered normal.[5] The structural similarity to pyridoxine can lead to decreased pyridoxal phosphate synthesis, resulting in deficiency and subsequent peripheral neuropathy. Isoniazid overdoses are therefore also counteracted with intravenous pyridoxine.[6] Metabolism primarily involves hepatic acetylation, with metabolites excreted in the urine. Slow acetylators are more susceptible to neuropathy, and prophylactic pyridoxine (20 mg/day) is recommended for these patients, as well as for other high-risk groups such as pregnant individuals and those with renal impairment, although robust evidence for this practice is lacking. Other notable side effects include mild rash and pellagra (vitamin B3 deficiency), especially in undernourished patients and individuals with alcohol dependence. Isoniazid's inhibition of MAO has occasionally led to a "cheese effect" (hypertension and flushing) following the consumption of tyramine-rich foods, as well as the onset of manic episodes.[1]

Lastly, the fixed-dose combination Rifinah® (rifampicin + isoniazid, €1.43/DDD) is a more cost-effective and patient-friendly option compared to separate tablets (€2.44/DDD), making it a practical choice in tuberculosis treatment.[5]

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Making science great again

Diederik A.M.P.J. Gommers[1] and David E. Vecht[2]
1 Chair ICU Department, Erasmus MC
2 Medical Student, Amsterdam University Medical Center

Photo by Marja Schuur

September was marked by a sudden change in weather, preluding the end of summer and the start of a new academic year. Gradually, everyone was picking up their daily routine. However, on the third Tuesday of September, this routine was put on hold as the government traditionally revealed its budgetary plans for the coming year. Although many sectors had been bracing for what would be announced, scientists and scholars were struck dumb when it was revealed that a whopping one billion euros would be cut from higher education and scientific research. The Netherlands has a leading position worldwide regarding the number of ongoing study projects and published papers. Universities now face tough decisions about which project to continue, as maintaining all ongoing projects with a reduced budget is not an option. Nevertheless, it is still unclear which funds will be affected, causing much tension among scholars as nobody knows what to expect.

What is clear though, is that times have changed. During COVID, there was an almost unlimited availability for health sciences, driven by a globally shared desire to make the sky the limit again, rather than a daily trip to the local supermarket. However, today, overall priorities have shifted to the increasing costs of daily life, (inter)national disputes and – recently – the resuscitation of a well-known world leader. Health sciences isn't on the first place anymore and with dwindled funds, it is unavoidable for universities to restructure research strategies. As we know, medical plans don't always align with financial management. However, medical science could benefit from some structural changes, and only mocking the government for its financial decisions wouldn't be fair.

A little rivalry among research groups from different faculties is common. Although competition can boost efficiency, it is useless to reinvent the wheel and to set up studies that have recently been conducted by other research groups. Instead, universities could settle on which aspects each should focus. Take for example the specific focus of Dutch vascular research groups. Rotterdam mainly focusses on endovascular procedures in vascular surgery, whereas Utrecht investigates how endovascular interventions can be implemented in cardiothoracic surgery. Maastricht, on the other hand, is known for its knowledge on complex open thoracic abdominal aortic aneurysms. In this way, they complement each other and all of them therefore have durable research programs.

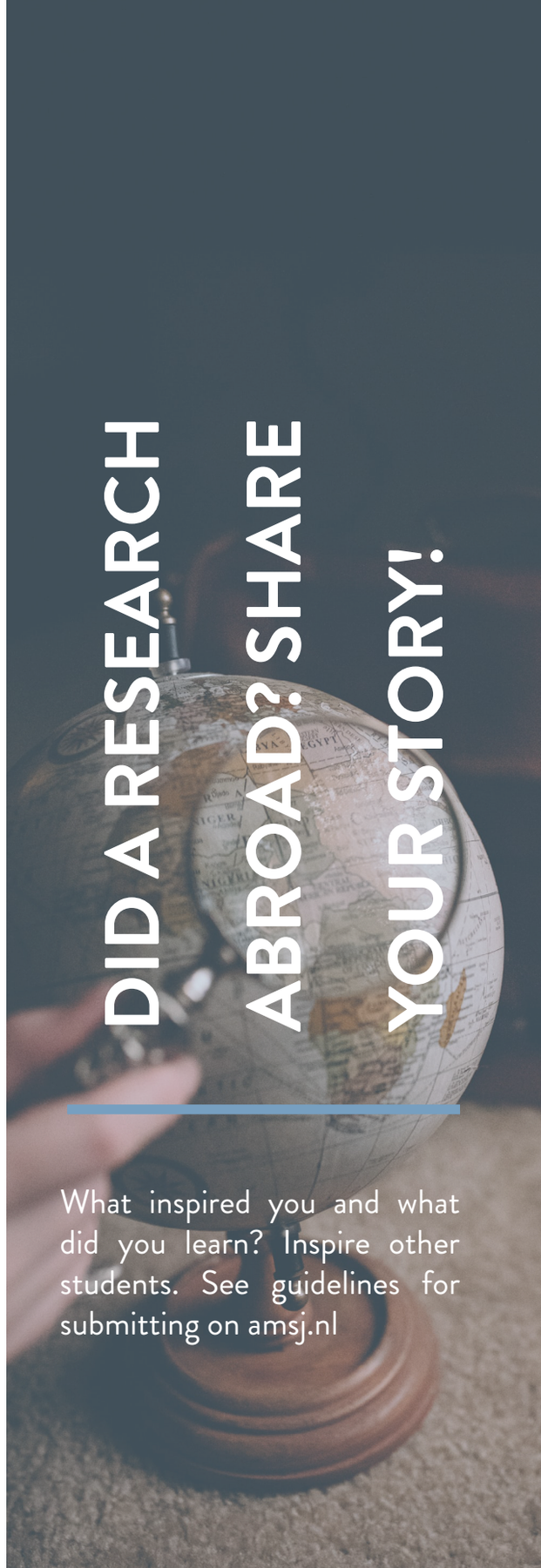
Complementation of research groups is also an incentive to look for international collaboration. With Dutch funds being reduced, European grants are becoming the new financial main source. However, European funds can be quite demanding as they usually tend to spend money on large international multicentre studies. Therefore, faculties should try to join forces which would not only increase financial power, but also brain and statistical power, significantly increasing the chance of a possible European fund.

Of course, I can imagine that all of the above sounds entirely reasonable to a seasoned professor overseeing multiple research lines. However, since most of you are fresh but promising scientists, I understand that you may feel a bit overwhelmed, as it can be a little ambitious to find yourself at the forefront of a large multicentre trial when you have only just figured out on how to deal with that annoying error message in R that prevents you from running a Cox-regression model. However, do not underestimate your influence as a young scientist. Durability of research projects is of importance and as an individual researcher, you do have an impact on the course of an ongoing project. With rising health costs and shrinking budgets, more attention is put on the cost effectiveness of studies, i.e. in what way does a study contribute to reduction of health costs or better economies of scale. It is important to keep this in mind when setting up a research proposal and to underpin this with palpable examples. When applying for a grant, it helps tremendously when you can clearly hypothesize the clinical applications of your study.

But financial relevance is not all. Currently, society requires researchers to stronger emphasize the social impact of their studies. This may sound vague, but let's focus on some current challenges in medicine. During COVID we strove to treat every patient with all we had, and in a crisis, this is a reasonable response. However, with an aging population, increasingly complex medical treatments and a scarcity of medical resources - especially staff - we are coming to realization that continuing with current medical practices is not feasible in the long term. This will also have practical implications on how we conduct research, and as a scientist, it is important to adapt to these changes. The key term here is personalized medicine. Personally, I am convinced that we will have to integrate AI in our daily work, as it offers opportunities to the challenges we are about to face. Prediction models are slowly making their way in medicine. When patients present at the hospital, AI can help screen them and predict what treatments are likely to work best for each individual patient. This enables tailored medicine and could prevent useless, invasive therapies. With insurance companies getting a stronger influence in doctor's offices, this also allows doctors to better justify why a certain treatment was applied.

So, while there is much uncertainty about how the new government plans will affect our scientific institutes, don't let it make you too pessimistic. Try to see it as an encouragement to reform the way we practice science, with a broader view that includes financial impact and social accountability and fosters stronger cooperation between researchers. I see many opportunities where a fresh approach to research can contribute to better healthcare, as long as you stay optimistic and keep an open mind. The future is yours.

**This column is based on an interview with prof. Gommers conducted by David Vecht and Tina Vekua*



Spotlight MD/PhD – Rahul Bhoera

Rahul A. Bhoera[1] and Wouter Bakhuis[2]
1 MSc, Faculty of Medicine, Amsterdam UMC, location VU, Vrije Universiteit Amsterdam
2 MD PhD, Department of Cardiothoracic Surgery, Erasmus Medical Center, Rotterdam

(MD)PhD

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. In this edition, Rahul A. Bhoera tells his story about how he gotten a spot as a PhD candidate in cardiothoracic surgery after finishing his master thesis.

My name is Rahul Bhoera. Currently I am a fourth year medical student at the Vrije Universiteit Amsterdam and a PhD Candidate at the Cardiothoracic Surgery department at the Leiden University Medical Center (LUMC). It has always been my dream to become a cardiothoracic surgeon and I would like to elaborate on my journey and experience.

I started medical school in 2020 and obtained my Bachelor's degree in 2023. These three years flew by fast, but I learned a lot and made friends for life. I tried to get involved in the field of cardiothoracic surgery as early as possible. After doing research at the Amsterdam UMC for a year, I got in touch with a surgeon at the LUMC that would play a valuable role in my journey: Dr. Meindert Palmen.

Dr. Palmen supervised my Master thesis on robotic mitral valve surgery. A quite novel topic, since the LUMC is the first to publish results of the robotic mitral valve surgery program in the Netherlands. I worked hard and tried to get the most out of my experience at a new department. Fortunately, this did not remain unnoticed, because Dr. Palmen offered me a PhD position only a few days after I started. After successfully finishing my thesis, I worked as a PhD candidate for a full year while waiting for my internships to commence.

The field of cardiothoracic surgery is constantly evolving. With the eye set on improving patient outcomes, cosmesis and quality of life, minimally invasive approaches such as the robot are increasingly investigated. My research focuses on innovations in mitral valve surgery, starting with the robotic approach with its surgical learning curve and surgical outcomes. I find this a very interesting and important topic, since this is what we all do it for: improving patient outcomes. My research could play a major role in that and that is what motivates me.

I will combine my PhD with my medical internships, which will start in a few weeks. In my opinion it will be manageable to combine with adequate planning. What I know from last year is that doing research varies in intensity throughout the trajectory. You will learn to anticipate these intensity shifts and plan the rest of your life around them. I know that is easier said than done and internships are not that plannable. However, I truly believe hard work and my ambition will guide me through the following years.

As for tips for students who share my interest. There is a quote I always keep in mind: "A candle never loses its light by lighting another candle". Yes, hard work and motivation will bring you far, but I have a lot to thank to my peers and mentors. We form the next generation of physicians and we must help each other and the ones after us to achieve our goals.

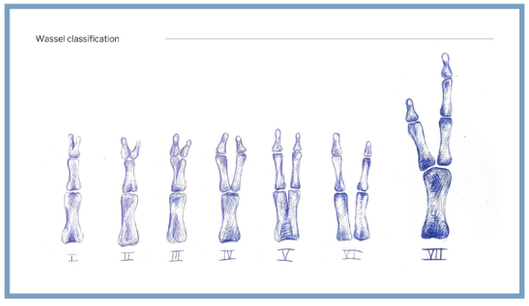
Lastly, working hard is important, but so is relaxing from time to time together with spending time with our loved ones.

Welcome to the new rubric in the AMSj: Medical Illustrations

Juliette van Limbeek[1]
1 Medical Illustrator at Amsterdam Medical Student journal

Who am I?

My name is Juliette, I am a medical student at UvA and I am the new medical illustrator of the AMSj! Currently, I am doing my clinical rotation at the department of surgery. I have been enthusiastic about surgeryfrom a young age, and hope to find a job in this sector later on. Taking care of pre- and post-operative patients with weekly operations where you get to work hands-on and utilize your creativity seems like the perfect combination.



What is a medical illustrator?

Most medical students are familiar with medical illustration works such as the Netter Anatomical Atlas. But the work of a 'medical illustrator' is not limited to just making drawings: from sculpting to animation, digital art to 3D printed models: the work of a medical illustrator consists of making products for patients, doctors, the healthcare sector, or the general public. The goal is to increase 'health literacy', which is the capacity of people to understand and use health information.

How did my journey as a medical illustrator start?

During the waiting period for the clinical rotations, I wanted to combine gaining knowledge with hands-on experience. I found a Master programme in Scotland in a small student town called Dundee, where 'Medical Art' was offered as a subject. In 12 months, you learn the tricks of classic illustration, using digital programs such as Adobe Photoshop/ Illustrator for 2D, or ZBrush for 3D models. You even learn the basics of animation. CT-scans are used for converting to printable models, and in the anatomical theater, you are taught to draw what you see.

One example is the thesis I wrote in Dundee. I made educational videos for patients and their parents/caregivers in collaboration with a plastic surgeon at the AUMC. In this case, I am referring to people with cerebral palsy who suffer from a spastic upper limb and can undergo various types of intervention for this. The videos (scan the QR-code below to watch on youtube) explain the process to the children and their parents in a clear way, and the illustrations help further their understanding of the video content. This not only gives the patient and their caretakers peace of mind, but also a feeling of independence that these videos will always be available at their disposal.

What can you expect from this rubric in future editions?

In the coming period, I will work hard to explain and clarify the new and interesting results from various rubrics and manuscripts published in AMSj through illustrations, which will be shared with AMSj readers in every edition. I hope you all enjoy them!

A Blue Baby

Marieke I. van Schie[1] and Michael W. van Emden[2]
1 MSc, Faculty of Medicine, Amsterdam UMC, Location VUmc
2 MD PhD, Department of Anatomy and Neurosciences, Amsterdam UMC, Location VUmc

Photo by Anneke Hymmen

FIGURE 1 Étienne-Louis Arthur Fallot

A concerned set of parents bring their 3-month-old infant to the Emergency Department, alarmed by episodes of bluish skin and lips, especially noticeable when feeding. They describe how their little one gets out of breath easily, often sweats during feeds, and hasn't gained any weight the last couple of weeks. The doctor examines the baby and hears a systolic heart murmur. An echocardiogram is quickly ordered, and the report reveals the following findings:

1. Pulmonary stenosis
2. Ventricular septal defect (VSD)
3. Right ventricular hypertrophy
4. An overriding aorta

With these results in hand, the doctor explains to the parents that their baby has Tetralogy of Fallot.

This congenital heart disease is named after Étienne-Louis Arthur Fallot, a French physician who lived from 1850 to 1911 (FIGURE 1). Fallot attended medical school in Marseille and wrote his dissertation on pneumothorax in Montpellier. In 1888, the same year he was appointed Professor of Hygiene and Legal Medicine in Marseille, he published his famous article on what he called "la maladie bleue" (the blue disease). In this article, he described the clinical and pathological-anatomical characteristics of three young boys, together with a survey of 50 previous observations, who had been suffering from cyanotic skin and fatigue since childhood. Although Fallot wasn't the first to report cases of so-called "blue children", he was the first to clearly describe the four cardiac anomalies and define it as an entity[1,2].

The first defect is a pulmonary artery stenosis, which Fallot himself identified as the primary disorder from which the other three arise1. This narrowing of the pulmonary artery restricts blood flow to the lungs, causing the pressure in the right ventricle to increase. The second malformation is a VSD - a defect between the left and right ventricles. Due to the elevated pressure in the right ventricle, poorly oxygenated blood shifts to the left side of the heart. The third defect, right ventricular hypertrophy, develops as the right ventricle works harder to push blood through the narrowed pulmonary artery. Over time, the muscle wall of the right ventricle thickens due to the increased workload. The final anomaly is an overriding aorta, meaning

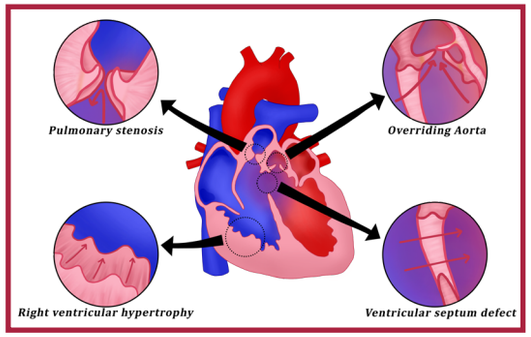


FIGURE 2 Heart with the Tetralogy of Fallot.
Figure by Juliette van Limbeek

the aorta is positioned over both ventricles[3] (FIGURE 2). These four characteristics cause mixing of deoxygenated blood into the systemic circulation, reducing the oxygen content in the bloodstream, leading to cyanosis. The clinical presentation varies widely from mild symptoms to severe acute hypoxic attacks, so called "tet spells", whereby infants may even lose consciousness.

In 1924, years after Fallot's passing, pediatric cardiology pioneer Maude Elizabeth Seymour Abbott officially named the condition 'Tetralogy of Fallot', forever associating his name with the most common congenital heart disease[4].

For a long time, Fallot's observations were considered merely out of theoretical interest and curiosity, as there was no therapy available yet. It was only in 1955 when the first surgical repairs were performed3. Nowadays, infants who are diagnosed with the Tetralogy of Fallot get surgical treatment in the first year of life, improving their life expectancy tremendously.

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A novel approach in treatment of schizophrenia

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2 Faculty of Medicine, Vrije Universiteit, Amsterdam UMC location VUmc
3 GGz Centraal, Outpatient clinic location Rembrandthof, Hilversum

Despite the traditional reliance on antipsychotics that target dopamine receptors, schizophrenia remains challenging to manage. This is primarily due to the high incidence of treatment resistance, affecting up to 34% of patients. Moreover, dopamine-blocking drugs often lead to extrapyramidal symptoms, with a negative effect on treatment adherence and patient wellbeing.

Cobenfy (xanomeline-trospium chloride) is a novel antipsychotic with a unique mechanism of action targeting cholinergic receptors, displaying promising effects on schizophrenia symptoms while limiting common side effects. This dual-agent therapy of xanomeline and trospium was recently approved by the US Food and Drug Administration (FDA) for the treatment of schizophrenia. In contrast to traditional antipsychotics, xanomeline and trospium do not act on D2 dopamine receptors. Xanomeline acts on the M1/M4 muscarinic receptors in the brain, which play an active role in regulating cognitive and psychotic symptoms. Trospium is a peripheral muscarinic antagonist used to minimize side effects of xanomeline without jeopardizing its mechanism of action. By targeting the cholinergic receptors, this dual drug offers a new and unique approach to treating the psychotic symptoms of schizophrenia.[1]

A recent Phase 3 randomized clinical trial investigated the efficacy and safety of xanomeline-trospium chloride in treating acute psychosis in individuals with schizophrenia.[2] The trial was conducted across multiple centers and involved 256 participants diagnosed with schizophrenia, randomized to receive either xanomeline-trospium or a placebo for five weeks. The primary outcome was the change in the Positive and Negative Syndrome Scale (PANSS) total score, a widely accepted measure of schizophrenia symptom severity. Results demonstrated a significant reduction in PANSS scores with xanomeline-trospium compared to placebo (MD: -8.4; $p<0.001$). The safety profile was favorable, with mild to moderate cholinergic side effects such as nausea, dyspepsia, and constipation, observed more frequently in the treatment group. Critically, xanomeline-trospium did not lead to significant weight gain, sedation, or extrapyramidal symptoms, differentiating it from conventional antipsychotics.

This trial supports xanomeline-trospium as an effective and tolerable option for schizophrenia, emphasizing its unique mechanism of action targeting muscarinic receptors. By addressing limitations associated with dopamine-receptor antagonists, xanomeline-trospium holds promise as a transformative therapy in this domain. These findings align with outcomes from previous EMERGENT trials, underscoring its potential to redefine the pharmacological landscape of schizophrenia treatment. Further research is needed to evaluate its long-term efficacy and, most importantly, its safety in broader patient populations.

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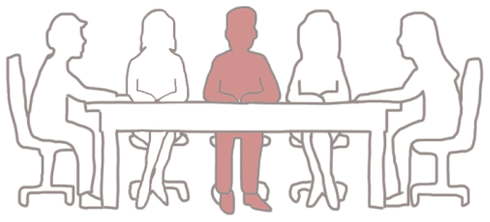
MEET OUR TEAM

Cevin Tan, Treasurer of AMSj



My name is Cevin. I am excited to partake in the General Board as the treasurer. I recently completed my bachelor's in Medicine at the VU, and I'm currently working as an advisor for the government, focusing on modernizing their digital landscape. You might think that's an odd job for someone who studied medicine, but I secretly have a background in Information Science as well.

I joined AMSj because I have a keen interest in research—I have worked on two research articles myself—and I've realized that the publishing process is a whole different ballgame compared to conducting research or writing. I am eager to give fellow students the opportunity to experience this process and make the publishing process of articles more accessible to everyone.

As a treasurer, I'll be managing the finances and recruiting sponsors to help support the amazing initiative AMSj is. I took on this role because I enjoy having oversight and working with numbers. Additionally, this position allows me to engage with different stakeholders while ensuring the financial health of the organization, which I believe is essential for creating a supportive environment for everyone involved in the process.

This year, I'm looking forward to collaborating with the amazing team behind AMSj on exciting projects that will elevate the organization and enhance our community's engagement with medical research, hopefully inspiring more students to get involved.

Dr. Rutger-Jan Swijnenberg, Hepatobiliary and Pancreatic Surgeon

Interviewd by Philip D. Leenart[1]
1 MSc Student, Amsterdam UMC location AMC, University of Amsterdam

Dr. Rutger-Jan Swijnenburg

Could you introduce yourself and your current role?
"I am Rutger-Jan Swijnenburg, HPB (Hepatobiliary and Pancreatic) surgeon at Amsterdam UMC since 2018. My focus is on treating complex cases and advancing precision techniques in surgery to improve outcomes for patients with tumors in the liver, pancreas, and biliary tract."

What inspired your interest in HPB surgery and surgical oncology?
"During my clinical rotations and early training, I realized I found oncology both fascinating and challenging. There's a significant human aspect: patients often face serious diagnoses and their families are deeply involved. That balance between providing technical excellence and offering compassionate care appealed to me."
"At one point, I considered becoming a cardiac surgeon, but I wanted a broader scope. HPB surgery allowed me to combine cutting-edge surgical techniques, like minimally invasive procedures, with a more holistic approach to patient care."

You spent significant time at Stanford University. How did that experience shape your career?
"Stanford was incredibly formative for me. Initially, I went for a year of research on heart transplantation techniques, but I returned for a PhD in molecular imaging and stem cell transplantation. The academic environment there was inspiring. There were constant lectures by world-class experts, and the facilities supported truly innovative research."
"One key takeaway from Stanford was the emphasis on collaboration across disciplines. That mindset still influences my work today - whether it's integrating molecular imaging into surgery or fostering teamwork in complex procedures."

How has your international experience influenced your approach to medicine?
"My time at Stanford University broadened my perspective on research and innovation. The resources, technology, and collaboration I experienced there showed me what's possible when

people from different disciplines work together. I've carried that mindset into my current role, always looking for ways to integrate new technologies and foster teamwork within our field."

Your research focuses on molecular imaging and precision surgery. Can you tell us more?
"My research revolves around what we call 'precision surgery.' It has two pillars: selecting the right patient for the right operation and ensuring we perform surgeries with maximum accuracy while minimizing invasiveness. For example, in liver surgery, it's not just about whether the tumor can be removed anatomically, but whether removing it makes biological sense for that patient."

"We use advanced tools like fluorescence imaging, 3D modeling, and robotic platforms to visualize tumors more clearly during surgery. The integration of these technologies into operating rooms is transforming how we approach cancer treatment."

How do you see the future of HPB surgery evolving?
"The future of HPB surgery is highly exciting. Advances in robotic surgery, imaging, and molecular diagnostics are transforming how we approach tumors. For instance, using 3D imaging and fluorescence during surgery allows us to be more precise, while biomarkers like circulating tumor DNA can guide treatment decisions. Collaboration with radiologists and oncologists will also play a pivotal role in refining treatments and improving outcomes."

What role does education play in your career?
"Education is central to what I do. Since 2023, I've been the program director of the Master Oncology program at the VU. This role allows me to train students who will go on to conduct high-level research, not just in the Netherlands, but globally. Every year, the program graduates about 30 students ready to make significant contributions to oncology research."

"I also mentor PhD candidates and young doctors. It's rewarding to see their growth and to help shape the next generation of medical professionals."

What advice would you give to medical students considering a career in HPB surgery or surgical oncology?
"Follow your passion and don't be afraid to think big. HPB surgery is a niche field, but if it's something you're drawn to, go for it. Make a five-year plan and work towards your goals step by step. The combination of clinical expertise, research, and innovation makes this field both challenging and deeply rewarding."

"Also, remember the importance of teamwork. Complex surgeries rely on collaboration with radiologists, oncologists, and other specialists. Building strong connections with your team is as critical as mastering surgical techniques."

CURRICULUM VITAE

2006	*Graduation medicine at Leiden University*
2009	*Graduation PhD at Stanford University, Molecular Imaging in Stem Cell Transplantation*
2009	*Start AIOS at LUMC*
2015	*Start Fellowship at LUMC*
2018	*Function as specialist: Hepatobiliary and Pancreatic Surgeon AUMC*
2019	*Principal Investigator, Precision Surgery for Hepatobiliary and Pancreatic Cancers*
2023	*Professor, Head of department: Associate Professor, AUMC*

CURRENT FUNCTION
- *HPB Surgeon, AUMC*
- *Associate Professor of Hepatobiliary and Pancreatic Surgery, AUMC*
- *Member of Research Board, Cancer Center Amsterdam*
- *Program Director, Master Oncology, Vrije Universiteit Amsterdam*

EMAIL *r.swijnenburg@amsterdamumc.nl*

"Follow your passion and don't be afraid to think big"

Compendium Medicine VGT

QUESTION 1
When the lungs cannot expand fully, less oxygen can be inhaled. Patients will have to breathe more often in order to get enough oxygen. Multiple Sclerosis is an example of a condition where this is the case. The description above is a form of:

A. Obstructive lung disease
B. Restrictive lung disease
C. Combined lung disease

QUESTION 2
The negative predictive value (NPV) is the probability of someone not being sick when receiving a negative test result. You can calculate the NPV by:

A. $\frac{\text{Total number of sick individuals (E)}}{\text{Total Population (I)}}$

B. $\frac{\text{Total number negative test results (H)}}{\text{Total number of sick individuals (E)}}$

C. $\frac{\text{Number of negative test results (H)}}{\text{Total number of negative test results (H)}}$

D. $\frac{\text{Total number of sick individuals (E)}}{\text{Number of negative test results (H)}}$

QUESTION 3
An 80-year-old patient believes that every time he listens to the radio, he is the subject of discussion. His partner indicates that he is becoming more suspicious. This patient is suffering from:

A. Hallucinations
B. Loss of decorum
C. Delusions
D. Lack of thought

QUESTION 4
You see a patient with fluid accumulation in the lungs. The patient initially experienced shortness of breath only during exertion but now reports experiencing shortness of breath and a dry cough even when lying flat. What type of heart failure is this?

A. Left-sided heart failure
B. Right-sided heart failure

QUESTION 5
During embryonic development, the skin, eyes and ears, brain, and nervous system develop from:

A. Ectoderm
B. Endoderm
C. Mesoderm

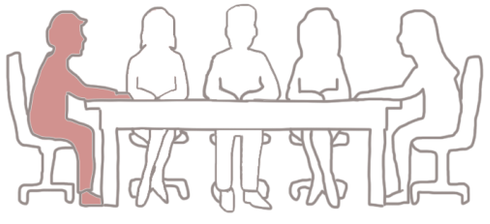
Correct answers: 1B, 2C, 3C, 4A, 5A

MEET OUR TEAM

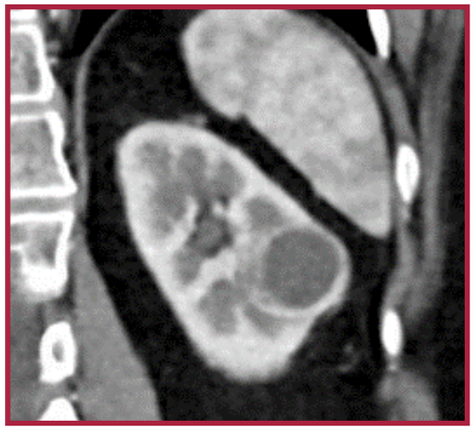
Harun Osmani,
General Board AMC member of AMSj

My name is Harun, and I am one of the General Board members of AMSj. Alongside my medical studies, I have completed a master's degree in epidemiology. Sharing knowledge and encouraging critical thinking in the field of medicine are highly important to me. With my background in medicine and epidemiology, I am able to analyze research results from various perspectives and teach my fellow students to do the same. This is why I actively organize journal clubs, workshops, and other scientific activities within AMSj. My goal is to support fellow students in developing their academic skills, enabling them to make evidence-based decisions in their future careers.

I am responsible for organizing the journal club. In the last session, I discussed randomization, explaining various techniques such as stratified, block, and simple randomization. The journal club was established in 2016 with the aim of providing education to student reviewers.



Answers Radiology Image



Correct answers: 1A, 2C, 3C

EXPLANATION

RCC typically does not respond to chemotherapy, with surgical resection being the main treatment for early-stage tumors. Targeted therapy and immunotherapy are reserved for advanced RCC.[1]

A single procedure was considered to simultaneously address both the breast cancer and RCC; however, in this case, the decision was made to expedite the breast tumor surgery due to chemotherapy side effects, while the nephrectomy was postponed.

Breast cancer commonly metastasizes to the bone, lungs, and liver. The kidneys are a rare metastatic site for breast cancer, and usually only occur in widespread disease. Because of this, the kidney is not typically included in routine follow-up for metastasis in breast cancer patients.[2]

Conversely, breast metastasis from RCC is rare and typically requires thorough investigation to distinguish between a metastasis and a primary tumor.[3]

Central hypodensity in RCC often indicates necrosis due to a tumor not receiving enough blood supply. Tumor necrosis is a negative prognostic factor because it is usually associated with rapid tumor growth, poor vascularization, and aggressive tumor behavior. Due to this, necrotic tumors have a higher chance of recurrence and metastasis.[4]

Arterial enhancement and exophytic growth are common features but are not as directly related to prognosis.

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Answers Clinical Image

Correct answers: 1A, 2B, 3D

EXPLANATION

Netherton syndrome, also known as Comèl-Netherton syndrome, or ichthyosis linearis circumflexa. Netherton syndrome is a rare, autosomal recessive skin condition that is present in patients since birth. While the condition can spontaneously go into remission, symptoms like dry skin, itchiness, flakes on the hand palms and soles of the feet, hair shaft abnormalities and ichthyosis linearis circumflexa develop later in life. The manifestation, called ichthyosis linearis circumflexa (ILC), is characterized by migratory erythematous plaques with a double-edged scale appearance. These scales tend to move over time and are not fixed, therefore being called 'migratory'. While ichthyosis linearis circumflexa can appear on its own, it is usually an element of Netherton syndrome. Since the skin barrier is disrupted in people with Netherton syndrome, they are more prone to developing infections and allergies. Atopy often occurs, with the clinical picture closely resembling atopic eczema. Furthermore, the innate and acquired immune systems do not work optimally for patients with Netherton syndrome.[1]

The diagnostics for Netherton syndrome are based on clinical examination, symptoms, and genetic testing. With DNA-testing a skin biopsy, an abnormality in the SPINK5-gene would be found in patient with this syndrome.[2]

Topical corticosteroids can potentially weaken the already impaired skin barrier of patients with Netherton syndrome further.[3]

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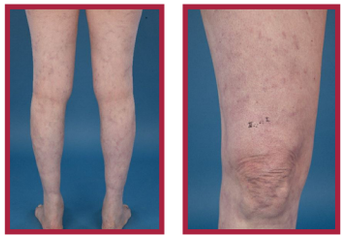

Correct answers: 1C

EXPLANATION

Livedo racemosa describes a blueish-red mottling of the skin in an irregular, reticular pattern. It is associated with underlying conditions such as livedoid vasculitis, systemic lupus erythematosus (SLE), Buerger's disease, polyarteritis nodosa (PAN) and antiphospholipid syndrome. It differs from the more common and benign livedo reticularis by its extensiveness (not limited to the legs) and shape (broken circular segments) and the fact that it persist on warming. Livedo vasculopathy presents with bilateral lower limb lesion, and cutis marmorata telangiectatic congenita is a vascular anomaly that is present from birth. After further investigation this patient was diagnosed with cutaneous PAN, which is a rare form of vasculitis that involves small and medium-sized arteries of the dermis and subcutaneous tissue. Cutaneous PAN is skin-limited, whereas classic systemic PAN can affect the kidneys, joints, muscles, nerves, and gastrointestinal tract as well as the skin Nevertheless, mild systemic symptoms may also develop in cutaneous PAN, as was the case with this patient. In addition, patients with cutaneous PAN should be monitored closely over time for progression to systemic PAN

Reconsidering pain management for IUD placement: is it time to standardise local anaesthetics?

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Social media and newspaper headlines were exploding: should we offer a local anaesthetic when placing an intrauterine device (IUD)? An IUD is inserted into the uterus during a procedure that typically lasts a few minutes. However, many patients describe it as significantly painful, particularly during the steps where the cervix is stabilized with a tenaculum and dilated prior to insertion.[1,2] Current guidelines recommend oral painkillers such as paracetamol or ibuprofen to manage discomfort [3]. Yet, the question of whether a local anaesthetic, specifically a paracervical block, should be used has reignited debates among the public.

A paracervical block involves injecting an anaesthetic, such as lidocaine or prilocaine, to zanesthetise the nerve bundles around the cervix[2,4]. It specifically reduces pain when the cervix is manipulated or dilated. There are also other local options available, such as lidocaine sprays or gels. These offer non-invasive alternatives that can reduce pain locally, but might do so in a lesser extent [5]. The use of local anaesthetics carries potential side effects, such as dizziness, tinnitus, blurred vision, nervousness, and in rare cases severe adverse reactions[6]. Administering local anaesthesia may prolong the procedure and requires additional preparation, which some practitioners see as a drawback.

In the recent media debate, the Dutch General Practitioners Association (NHG) stated that they did not include local anaesthesia in its guidelines, as evidence to recommend its routine use in first-line care is insufficient. However, the NHG acknowledges the importance of balancing the risks and benefits of pain management options and states it is not prohibited[7]. Some local clinics, and hospitals, already offer local anaesthesia. Thus, even though it is not standard practice, local anaesthetics are available to patients seeking additional pain relief during IUD placement.

The controversy in media platforms stems from the narrative that many medical procedures were historically designed by men. Voices online argue that women should reclaim the power to make decisions about procedures involving their bodies. Perhaps it is time for changing perspectives. Offering the option of local anaesthesia during IUD placement could benefit patients and potentially remove barriers to choosing this contraceptive method. However, local anaesthesia is not without risks and comes with additional costs. Other, less-invasive, forms of contraception could therefore also be considered, such as the contraceptive pill. If preference still goes to an IUD, shared decision-making could be used to decide on a pain management strategy.

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Colophon

Amsterdam Medical Student journal (AMSj) is a scientific medical journal with the purpose to enable medical students to publish clinical observations, research articles and case reports. The journal was founded by students from the Amsterdam UMC, location AMC and VUmc, in Amsterdam with the intention to provide education and development of academic skills for medical students. The entire journal is created and published by staff members and students from both medical faculties.

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The Vitruvian Man of Leonardo da Vinci

Vitruvius was an architect in the time of the Roman Empire. He proposed a proportional theory: a human figure could fit perfectly inside a circle and a square. However, his work did not include illustrations. Years later, Leonardo da Vinci performed his own research influenced by this theory. He created a drawing based of of his own measurements to combine the principles of humanism, geometry, anatomy and art.[1]

In this and in the next editions you will see more of the implemention of art in the medical sciences to improve the 'health literacy' of patients and doctors.

1. Baugh LS. Vitruvian Man. Encyclopedia Britannica. [Internet]. Available from: https://www.britannica.com/topic/Vitruvian-man. [Accessed 22nd December 2024]