MEDICAL BUSINESS
THE DUTCH EHR-SYSTEM: CURRENT PROBLEMS AND IMPLICATIONS OF BLOCKCHAIN

ARTICLE
THE ROLE OF ENDOTHELIOPATHY IN THE PATHOGENESIS OF COVID-19

Amsterdam Medical Student journal

EDITION 22 | MARCH 2021
On behalf of the editorial board, I am delighted to welcome you to the first AMSj edition of 2021! I am proud to tell you that the authors and reviewers once again managed to produce a beautiful edition. Thank you all!

This edition is quite varied and contains something intriguing for all people. Three interesting manuscripts have been written by ambitious authors, with subjects varying from the role of endotheliopathy in COVID-19 to dissociative identity disorder and improving health data sharing between healthcare professionals. Do conducting research abroad and Africa make your heart beat faster? Read all about it on page 11.

Furthermore, would you like to learn more about becoming a PhD candidate and hear the experience of someone who recently finished her PhD? Read more on page 19.

We are also introducing a new column named ‘Initiatives with impact’. This column highlights initiatives with impact within the educational, management and/or research sector which in some way have (had) impact on society. Exactly how did an initiative emerge, what is the scientific background, what difficulties did the author(s) encounter during the process, and what steps have been taken to achieve the goals and create impact? Who kicks off this column… Dr. Koster! He is a pioneer who was part of an initiative with an enormous impact; introducing AEDs to allow non-medical persons to defibrillate before ambulance arrival.

Curious? Read all about it in this edition!

Last but not least; allow us to enthuse you! We encourage medical students to take a look at the AMSj guidelines and submit their manuscript to AMSj. This could be a case report, original article, experimental study, bachelor- or master thesis, systematic or narrative review, meta-analysis, and so forth! We will guide you through the review process and perhaps your manuscript will be announced as ‘Best manuscript of AMSj 2021’.

More information can be found on www.amsj.nl. Do not hesitate to contact chief-editor@amsj.nl if you have any questions.

Take a moment and enjoy the 22th edition of AMSj.

Yours sincerely,

Elise Beijer
Editor-in-Chief
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Teledicine and personal protective equipment

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In the COVID-19 pandemic, patients with a confirmed infection are treated in contact isolation to prevent transmission from patients to healthcare workers. Personal protective equipment (PPE) is used by healthcare workers and must be changed every patient contact. The World Health Organization has advised to limit the use of PPE, to prevent an international shortage.1 Teledicine has been suggested to reduce PPE use.2 In current literature, however, it remains unclear if the introduction of teledicine reduces PPE use in the treatment of patients with COVID-19. A study by Candel et al. aimed to investigate whether teledicine (using iPads) reduces the use of PPE in the emergency department (ED). The study shows that the use of teledicine significantly decreases the total PPE use per patient contact for ED physicians. However, the time physicians spend on patients in contact isolation also considerably decreases, having a negative impact on the contentment of hospitalized patients. No significant differences were observed for anxiety levels and satisfaction scores among patient groups.1 Teledicine in the ED could successfully reduce the use of PPE, without increasing anxiety levels or dissatisfaction among patients. Limiting the use of PPE contributes to saving costs, reducing medical waste and preventing shortages.


Big progress in kidney tissue regeneration

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Chronic Kidney Disease (CKD) is a global issue and poses patients at high risk of development of end-stage kidney disease. Currently, the two main therapies to replace kidney function are kidney transplantation or dialysis. However, both life-saving options have an important negative impact on patient’s quality of life. Regeneration of lost functioning kidney tissue may serve as a future alternative option in CKD. However, before implementation can be successful, many hurdles need to be overcome. In vivo generation of adequate vascular supply within the regenerated kidney parenchyma represents a crucial challenge. Pleniceanu et al.1 recently reported on their mice studies in which they introduced human renal tubule-forming cells (RTFCs), mesenchymal cells (MSCs) and endothelial colony-forming cells (ECFCs) into mice. Injection of MSCs with ECFCs resulted in donor-derived vascularized grafts, without tubular structures. Injection of MSCs in combination with ECFCs and RTFCs, resulted in grafts containing donor-derived tubular structures with tubular epithelia from different nephron segments. Strikingly, these grafts made out of human cells not only contained a network of donor-derived vessels, but were also successfully integrated in the host vasculature. These results set a promising basis for kidney regenerative therapies, and provide a big step in a potential future way to help CKD patients.


Perinatal mortality in the Netherlands

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In 2019 164,720 women gave birth to a total of 164,225 children after a pregnancy duration of at least 22 weeks.1 Perinatal mortality, defined as death of the child between 22 weeks of pregnancy until 28 days postpartum, occurred in 7.8%. Over the past 15 years the perinatal mortality rate has significantly decreased. However, in the last 6 years this decrease has stagnated.2 There are numerous factors that contribute to perinatal mortality such as prematurity, being small for gestational age, low APGAR-score and congenital defects (known as the Big 4). But unhealthy lifestyle of the mother and poor socioeconomic skills are also associated with increased perinatal mortality.

A news report from Perined states that the current stagnation seems mainly to be caused by these unhealthy lifestyle and socioeconomic risk factors. This is confirmed by higher rates of perinatal mortality in areas with poor socioeconomic skills.3 For example, for future mothers with a migration background it is even estimated that they attribute up to 25% of the total perinatal mortality.

In conclusion, the report advises that maternal and perinatal healthcare should respond more to lifestyle and social risk factors to prevent further stagnation or even increase in perinatal mortality rates in the Netherlands.

2. Rijksinstituut voor Volksgezondheid en Milieu (RIVM), Beter weten: een beger begin; samen sneller naar een betere zorg rondom de zwangerschap, 2020

A new type of anti-cancer drug with a Dutch origin

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Metastatic cervical cancer has a poor prognosis, with a 5-year survival rate of 17.2%.1 A potential new drug for this disease is tisotumab vedotin, an antibody-drug conjugate (ADC) in which highly toxic chemotherapeutic agents are linked, or conjugated, to an antibody. Via this mechanism, chemotherapeutic agents that would be too toxic for conventional intravenous administration are delivered to the tumor with higher specificity. In tisotumab vedotin, the antibody tisotumab has affinity for tissue factor (TF), which is highly expressed in solid tumors including cervical cancer and is associated with worse outcomes.2 The preclinical development of tisotumab vedotin was primarily performed in the Netherlands, at Gemmab BV. The innovaTV201 (phase I/II) study3 investigated tisotumab vedotin in previously treated patients with advanced and metastatic tumors, with unknown levels of expression of TF. Results showed an objective response rate of 24% compared to approximately 15% in previous therapies.4 The side effects seem manageable, although reported ovarian adverse events need further investigation into their mechanism. In conclusion, tisotumab vedotin could improve survival in metastatic cervical cancer. Further research is required to establish clinical efficacy in patients with varying expression of TF.

3. Gemmab and Seattle Genetics Present Data from Tisotumab Vedotin innovaTV 204 Pivotal Trial in Recurrent or Metastatic Cervical Cancer at ESMO Virtual Congress 2020.
Large scale digitization of data has been crucial for many sectors as it improves important factors such as time management, efficiency and wage costs. Digital records are more developed in some sectors - such as accountancy, business and finance - than others. Hospitals, general practices and pharmacies all have individual health record systems, though a national system still has not been realized. However, rapid exchange of information is essential to ensure the continuity of the provided healthcare. A bill that pleaded for the implementation of a national health record system in the Netherlands has unfortunately failed numerous times due to safety and privacy concerns. Recent studies have suggested that these hazards can be eradicated by using novel technologies, such as blockchain. The implementation of a national health record system needs to be realized in order to maintain and improve the quality of the Dutch healthcare system.

The inefficent communication between healthcares providers that the current system precipitates, does not only result in fragmented health services, but also in more errors. A report published by the Health and Youth Care Inspectorate (IGJ) in 2011 elucidated that hospital information systems were often not linked to the system of their associated pharmacy. Medical specialists therefore had no access to updated medication lists, and pharmacists were not able to view important patient characteristics (e.g. age, weight, relevant lab results), which made the system prone to medication-related errors. The implementation of a national EHR-system could avoid these errors, as it would enable the linkage of different health record systems and would give access to essential and updated information to all the healthcare workers that are involved in a patient’s treatment.

Opponents argue that a national EHR-system would not be safe enough and may lead to privacy violations. However, recent studies elucidate that the usage of novel blockchain technology for health record systems can eliminate safety and privacy hazards. Blockchain is essentially a system for data storage, originally made for Bitcoin cryptocurrency. It has three key features which ensure the safety of the information stored on the block-chain: (1) decentralized storage of data, (2) shared data ownership and (3) cryptographic security. A systematic review on blockchain-based EHR-systems pointed out that the use of blockchain has the potential to tackle common problems in healthcare, such as EHR interoperability, privacy, and establishing sharing trust between healthcare providers. Blockchain in national health infrastructures has already been tested in various pilots. Estonia, for example, is the first country to successfully apply blockchain technology in its EHR-system. The country started using blockchain developed by Guardtime in 2011 and has been using this technology since, proving the efficacy and safety of blockchain in the context of EHR. Blockchain technology therefore shows great potential in the development of secure EHR-systems, which makes it promising technology for the long-await Dutch national health record system.

In conclusion, the implementation of a national electronic health record system in the Netherlands can tackle important problems caused by the current EHR-system and improve the overall quality of the Dutch healthcare system. A national EHR-system would enable healthcare providers to easily access patient information of other providers, which would increase coordination between providers and improve continuity of the provided care. A national EHR-system would additionally result in fewer medication-related errors and decrease the chances of miscommunication. Lastly, safety concerns of a national system can be eliminated by the use of blockchain technology, making this a potential infrastructure for a national EHR-system in the Netherlands.
The role of endotheliopathy in the pathogenesis of Covid-19: A narrative review

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ABSTRACT
Coronavirus disease (Covid-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and has induced an immense crisis in health-care systems and in the economy worldwide. So far, no optimal treatment for Covid-19 has been established. As knowledge about SARS-CoV-2’s disease mechanism is essential for drug development, this review summarizes the presumed pathological processes that underly Covid-19. These include endothelial barrier dysfunction, coagulopathy and hyperinflammation. Because SARS-CoV-2 infects almost all organs, Covid-19 is recognized as a systemic disease. Further evidence shows that an overreacting immune-mediated response leads to excessive cytokine production, causing hyperinflammation and extensive tissue damage, resulting in multi-organ failure. These findings provide the rationale to explore immunomodulation and anti-cytokine agents as potential therapeutic options for the treatment of Covid-19. Clinical trials with cytokine inhibitors are warranted.

INTRODUCTION
The coronavirus disease 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) threatens global health and induces an unprecedented recession in the economy. As there are currently no optimal treatments available, understanding of its pathophysiology is most important for development of targeted therapies.

PATHOPHYSIOLOGY
SARS-CoV-2 is an RNA virus1 that infects nearly all organs, but mainly the lungs.2 Histopathological and biochemical studies suggest that the entry of SARS-CoV-2 into the pulmonary endothelial cells and the following inflammatory processes within these cells, play a central role in the pathogenesis underpinning Covid-19.3 After viral invasion of endothelial cells, three main pathological pathways simultaneously develop: endothelial barrier dysfunction, coagulopathy and hyperinflammation leading to a cytokine storm (see FIGURE 1).3

Covid-19-induced vascular leakage
The primary cause of mortality in patients with Covid-19 is acute hypoxic respiratory failure from vascular leakage and pulmonary oedema.2 The loss of vascular integrity is thought to be caused by both a direct and an indirect effect of the virus on the endothelium. First, SARS-CoV-2 can enter and infect endothelial cells through binding to the surface angiotensin-converting enzyme 2 receptor. An autopsy study with patients who died due to Covid-19 showed pulmonary vascular endotheliitis with the presence of intracellular virus and endothelial cell destruction.4 Second, activated neutrophils and lymphocytes triggered by the infected endothelial pulmonary cells produce an excessive amount of inflammatory cytokines leading to enhanced inter-endothelial gaps.2,5 Both the direct cytotoxicity of the virus and production of these cytokines induce loosening of inter-endothelial junctions, resulting in increased vascular permeability and alveolar oedema which hampers proper gas exchange. This endothelial injury with pulmonary thrombosis formation (discussed below) can cause acute respiratory distress syndrome (ARDS).6 Remarkably, the clinical features of Covid-19-associated ARDS are similar to that of those with ARDS unrelated to Covid-19.7

Covid-19-associated coagulopathy
A second concerning feature of patients with Covid-19 is a high incidence of thrombotic complications, including deep vein thrombosis, pulmonary embolism and arterial thrombotic events.8 This may again be related to endothelial dysfunction. The disruption of vascular integrity leads to exposure of the thrombogenic basement membrane which results in activation of the clotting cascade.9 Furthermore, cytokines, such as interleukin-1β (IL-1β) and tumor necrosis factor (TNF-α) activate endothelial cells to initiate coagulopathy by expression of P-selectin, von Willebrand Factor (vWF) and fibrinogen, to which platelets bind.10 After platelet binding, endothelial cells release thrombocytic cytokines that stimulate additional production of platelets and activate tissue factor, which is a strong activator of the coagulation cascade. Finally, thrombosis may also be induced by neutrophils that release extracellular traps resulting in neutrophil extracellular traps (NETs).3 These NETs can act as a foundation for binding of platelets that activate coagulation factor XI to generate thrombin and consequently, fibrin production causing thrombosis. As evidence that endotheliopathy evokes the Covid-19-associated coagulopathy, a biochemical study demonstrated that endothelium-specific biomarkers11 and platelet activation, including vWF, P-selectin and soluble thrombomodulin were elevated in Covid-19 patients.12,13 Importantly, the mortality rate was positively associated with the levels of these markers (r=0.38; p=0.0022).12 The clinical relevance of these biochemical findings was emphasized by autopsy series in which endotheliitis, NETs and thrombi were present in multiple organs, particularly in the lungs, heart and brain.1,4 However, a remarkable finding was that thrombi were also observed in organs with normal blood vessels.2 This implies that virus-induced endotheliitis is not essential for the development of Covid-19-associated coagulopathy.

FIGURE 1 After viral invasion of endothelial cells, three main pathological pathways simultaneously develop: endothelial barrier dysfunction leading to vascular leakage and alveolar edema, coagulopathy and hyperinflammation with cytokine storm be caused by virus-driven hyperinflammation.13,16 Although some studies debate the contribution of excessive inflammation in the development of Covid-19,17,18, malformation of endothelial cells is again essential in the development and progres-
sion of Covid-19-related cytokine storm. Infected endothelial cells express leukocyte adhesion molecules and also activate the complement system, promoting recruitment of leukocytes, including neutrophils and inflammatory cells. Profuse toxic mediators from neutrophils, together with the uncontrolled excessive cytokines produced by the inflammatory cells, lead to apoptosis of the endothelial cells and extensive collateral tissue damage. This mechanism was confirmed by immunohistochemical studies, in which extensive immune-mediated responses in many organs of patients with fatal Covid-19 were detected. Notably, the viral load of SARS-CoV-2 significantly decreased with increased disease course, while an exorbitant systemic inflammatory response was noted in the late phase of Covid-19. The disproportionate presence of neutrophils and NETs in relation to occasional presence of virus suggests a maladaptive immune-mediated response. This finding provides rationale for immunomodulation as a therapeutic option for the treatment of this disorder.

Therapeutic options

Several potential anti-SARS-CoV-2 drugs have been tested in clinical randomized trials worldwide, in which thousands of patients with Covid-19 were included. Thus far, remdesivir, hydroxychloroquine, lopinavir with ritonavir, interferon-β1a and azithromycin alone or in combination with hydroxychloroquine appeared to have little or no effect on patients with Covid-19. Up to now, corticosteroids have shown beneficial effects. The use of dexamethasone and hydrocortisone resulted in lower 28-day mortality and 93% probability of benefits respectively. Considering the autopsych-based findings that multiple organs are principally affected by severe inflammatory processes, the beneficial effects of corticosteroids emphasize the importance of downregulating the immune response in these patients. Until effective antiviral agents are available, the best remedy for Covid-19 might be administration of inhibitors of cytokines such as tocilizumab, in addition to corticosteroids with thromboprophylaxis. Although vaccinations against SARS-CoV-2 have been initiated in wealthy countries recently, three new and more contagious variants of coronavirus have been identified. These mutants might pose a new threat because the extent of the penetration of the current vaccines against these new strains is yet unclear. Pending the outcomes of the immunizations, clinical trials with antibodies against cytokines are urgently needed.

CONCLUSION

The global health and socioeconomic impacts of Covid-19 are enormous. Currently, the search for an effective treatment is the greatest challenge. The pathophysiological mechanisms of Covid-19 are endothelial barrier dysfunction, coagulopathy and hyperinflammation, which affects multiple organ systems. Clinical trials with immunosuppressive agents including selective cytokine blockers to mitigate the excessive inflammatory state are required.

ACKNOWLEDGEMENT

We are grateful to Dr. Botros and Professor Vink-Noordegraaf for the opportunity offered to write this article and thank them for their assistance in writing the manuscript.

REFERENCES

Research project: Operation Hernia 2020 in Ghana

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INTRODUCTION
My name is Nine de Graaf and I am currently working as a PhD candidate in Hepato-pancreato-biliary surgery at the Amsterdam UMC, now based in Brescia, Italy for a research fellowship. In the beginning of 2020 (just before the COVID-19 pandemic) I got the opportunity to join the ‘Dutch Operation Hernia’ (DOH) team on their annual surgical mission to Ghana, where I set up a prospective study on the outcomes of the mission as a research project for my master’s thesis.

RESEARCH PROJECT
In Ghana, many inguinal hernia cases remain untreated due to low capacity for essential surgical care and limited healthcare access for patients. Strangulation of unrepaired inguinal hernias is a severe and emergent complication, leading to needless deaths and permanent disabilities for generally physically fit and healthy people. Aiming to reduce these strangulation rates, DOH provides free hernia surgery in varying rural hospitals in Ghana during their annual missions (www.operationhernia.nl). Since 2009, ten DOH missions have been organized by a team of surgeons and residents from OLVG, St. Antonius Hospital, Tergooi and Hospital Amstelland and already more than 1500 patients received surgical treatment. Because of the mission’s short timeframe of only one week, the patient follow-up is normally done by the local hospital staff and a study into results of the DOH missions had never been performed. For this reason I joined the team to perform a prospective study of this year’s mission in the two participating rural hospitals in Keta and Sogakope, Volta Region of Ghana. After the mission had finished, I stayed in Ghana for six weeks to perform a follow-up of all included patients to measure short-term postoperative complications and quality of life. We were happily surprised that 90% of all patients returned to the hospitals 2-3 weeks after surgery! The results showed acceptable complication rates (comparable with Dutch practice), without any deep infections that would require reoperation. In order to fully assess the results and impact of the mission in terms of chronic pain rates and quality of life improvement, we plan to perform a long-term follow-up visit for all included patients (whenever the COVID-situation allows this).

APPLICATION
This research internship in Ghana followed right after my semi-arts stage (senior internship) at the Department of Surgery of OLVG Oost, where I got in contact with one of the surgeons who is in the lead in the DOH missions. As we were speaking about the missions and their interest in performing a quality study, the opportunity for me arose to join the 2020 mission to set up this study. Another student, and friend of mine, also joined the DOH team to Ghana to perform a different research project for Operation Hernia, so we were able to stay there with the two of us. As we arranged this internship directly with DOH organization, there was no selection process with other students.

EXPERIENCES AND LEARNING POINTS
Conducting research in Ghana has definitely been an experience. The country has a fantastic culture with an admirable positive spirit, beautiful nature and the staff of the hospital put so much dedication and effort into helping us with the project. As expected, though, certainly not everything went smoothly all the time. Some facilities (i.e. electricity, internet connection, printing services) are available to a lesser extent than we are used to in Dutch hospitals and hospital logistics also works differently. Hospitals in Ghana do not work with set appointments; patients just show up. ‘We will do this tomorrow’ actually means ‘this will be done in a few weeks’. This obviously required a change of mindset and a lot of improvisation but at the same time it has been a great learning experience for me. One piece of advice I would like to give to future students performing research projects abroad is to prepare your ethical approvals before your arrival, since regulations can differ from those in your home country. This would have saved me a lot of time, paperwork and long bus rides to the capital city’s health service office. For everyone who is up for an adventure, I would definitely recommend arranging your (research) internship abroad. It is possibly not the ‘easy way’ and might require you to work a little harder but no doubt you will gain a lot of experience that is useful for your further career, plus some unforgettable memories!
**Schema Therapy for Dissociative Identity Disorder: A Literature Review**

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**ABSTRACT**

Dissociative Identity Disorder (DID) is one of the psychiatric disorders that attracts a lot of attention and many studies review this disorder more deeply, one of them is about therapy for DID patients. Schema therapy is an integrative therapy combining cognitive therapy and a combination of therapeutic relationships with experiential, psychodynamic and interpersonal elements. The aim of this review is to discuss schema therapies as alternative therapies for the treatment of DID.

**INTRODUCTION**

Dissociative Identity Disorder (DID) is one of the controversial psychiatric disorders because of discrepancy in definition and the number of symptoms that occur in patients. According to the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), DID is an identity disorder that is characterized by the presence of two or more personalities with discontinuities in the sense of self-feeling and changes that affect behavior, awareness, memory, perception, cognition and sensory function. DID occurs more in people with a history of childhood trauma, child abuse (both physically and sexually), Posttraumatic Stress Disorder (PTSD) and Borderline Personality Disorder (BPD). Currently, estimates of DID worldwide range from 5% for psychiatric inpatients, 2–3% for outpatients and 1% for the general population. As the incidence of DID increases due to the increased rate of trauma in children, which can increase the risk of DID, so does the interest in developing the most effective therapy for DID patients. The major limitation in common DID therapy is the length of time it takes to achieve stabilization of the patient’s symptoms. Therefore, time-effective therapy without aggravating the patient’s dissociative condition needs to be investigated. Schema therapy (ST) is an integrative therapy that combines the treatment of traditional cognitive behaviors with experience, psychodynamic and interpersonal elements, using therapeutic relationships to treat psychological disorders that are not responsive to conventional therapy. ST focuses on how symptoms and difficulties form and how their effects can affect current maintenance factors. ST involves painful childhood experiences that play a role in Early Maladaptive Schemas (EMSs) of patients by focusing on re-experiencing and communicating the most vulnerable circumstances of childhood, where in childhood they required the care of parents or adults in their environment but did not get it. In ST, the therapist acts in a patient’s “reparenting” to meet the psychological needs of patients during childhood that were not previously obtained. Likewise, when re-imagining a traumatic experience, it is likely to require a strong trust relationship between therapist and client as a key technique in ST. In ST, various identities in DID, which are extreme forms of expression from dysfunctional modes, are reframed into normal modes. The aim of this review is to discuss schema therapy as alternative therapy for the treatment of DID.

**METHOD**


**RESULT**

Schema therapy, that has been developed as a therapy for chronic psychiatric disorders, can be an alternative treatment for DID. In schema therapy, the collaboration between the therapist-clinician and the patient is needed to achieve the therapeutic goals. However, studies conducted are still limited by the number of samples and further research on the influence of schema therapy for DID patients is needed.

**CONCLUSION**

Schema therapy can be a therapy for DID patients. However, further research is needed to test schema therapy in a wider population so that schema therapy can become the best therapy for DID patients.
CONCLUSION

Schema therapy can be an alternative treatment for DID which can improve the condition of patients with previous treatment failures. ST prioritizes the improvement of patients' experiences to accept themselves, so that patients can control their cognition without dissociative events occurring. However, studies on schema therapy are still limited due to population limitations so they cannot be generalized to more heterogeneous populations. However, studies on schema therapy are still limited due to population limitations so they cannot be generalized to more heterogeneous populations.

REFERENCES


TABLE 2 Summary of studies related to schema therapy

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Study population</th>
<th>Study type</th>
<th>Duration</th>
<th>Outcome</th>
<th>Effect sizes</th>
</tr>
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<tbody>
<tr>
<td>Samper et al (2017)</td>
<td>106 patients with DID</td>
<td>RCT</td>
<td>3 months</td>
<td>There is an increase in core beliefs and quality of life.</td>
<td>Effect sizes between pre-therapy and post-therapy: Cohen's d = 0.76 and 0.695.</td>
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Sciences so they need to be repeated in more heterogeneous population groups. Therefore, further research is needed in larger population studies to support evidence-based therapy in DID patients.
Henriette’s career can be described as an impressive combination of working as a general practitioner (GP) and being active in education, research and multiple board functions. This interview will go into Henriette’s research career, her view on public health in the Netherlands and general practice in the future.

What are your main research interests?
My main area of research is ‘medically unexplained physical symptoms’. This phenomenon already intrigued me when I studied medicine. I did an extra internship in the internal medicine department, gastro-enterology. I saw a lot of, mostly young, patients with abdominal complaints who received a lot of additional testing, while their probability of having a serious disease were almost zero, based on their symptoms and family history. I devoted my master thesis to this topic. My PhD study concerned the management of patients with Irritable Bowel Syndrome.

Could you name a highlight of your career?
Looking back, doing my PhD was a highlight. My dissertation also won the Telesphorus prize for the best dissertation carried out by a GP. I received the prize because I addressed a complicated theme and studied a number of issues on IBS and also added explained physical symptoms’. This phenomenon already intrigued me when I studied medicine. I did an extra internship in the internal medicine department, gastro-enterology. I saw a lot of, mostly young, patients with abdominal complaints who received a lot of additional testing, while their probability of having a serious disease were almost zero, based on their symptoms and family history. I devoted my master thesis to this topic. My PhD study concerned the management of patients with Irritable Bowel Syndrome.

What was a big challenge in your career?
After finishing my dissertation I became coordinator of the vocational training of general practitioners, while combining it with working as a GP. After that I started working as a senior researcher and helped with establishing the VU University Medical Center General Practice and the academic GP network. The academic GP network works with the department on research and innovation in education and health care and combines this to improve the GP. At some point I was asked to become the head of the department. I had many doubts at first but in the end I chose to apply for the job. After a year, and some time to reflect, I decided that I enjoyed the challenges that came with the job, which offered me an opportunity to lay down a policy that helped to reach relevant goals in education research and practice such as teaching students clinical reasoning and doing research that addressed important issues in daily practice. You are also working on prevention and public health. How do you think the current climate change will affect public health in the future? It depends on how you interpret public health, but I do think that if we do not control this climate crisis, it could have consequences for people’s health. Public health and lifestyle are more determined by political decisions and the opportunities that people have and their educational level than by the things doctors do. Prevention is much more effective if implemented on a societal level. There is a dichotomy in our society, the difference in healthy life years between people with a high and a low social economic status is 18 years. This difference is still increasing with the years, while we claim to have been working on this for 30 years already. We know that if you are having problems at work, debts, suboptimal housing or other problems, the ability to take care of yourself decreases. We assume people are self-reliant and want to make their own decisions, but sometimes another, more caring, approach is necessary. I think that one of the keys to decreasing the differences between these groups is to stop making economic growth our main priority. This could also be advantageous in dealing with the climate crisis. This asks for a change in government policy.

Are there certain things you would like to see in the field of the general practice in the future?
More research should be conducted on the diagnostic process in the general practice. In the field of prevention you can also think of multiple questions. In our health care system the tasks assigned to GPs are ever-increasing. What are our essential tasks when talking about prevention? How can we do that in an effective way, thus contributing to people’s health? Primary prevention is mainly effective on a societal level.

Do you have any advice for young medical students who are interested in research?
Choose a subject that really interests you and address a question for which you are really curious about. It also important to have good guidance when you start in research. Look for someone who is passionate about research and also likes to guide and coach others.

“Rheumatology is one of the medical fields most broadly integrated with others like gastro-enterology, internal medicine and many more.”
A PhD without a Master’s Degree

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In the column ‘Spotlight’ we shine a light on students who already published their research in other journals or started their PhD course before graduation.

Last year, Merle Stellingwerf (our creative editor), defended her PhD thesis titled ‘Surgery in Inflammatory Bowel Disease: a different point of view. We have invited her to tell us more about her PhD trajectory, which she finished before actually obtaining a Master’s degree.

During a clinical lecture a young patient with ulcerative colitis told a story about queuing up for a bar on a Saturday night out, however, she just had a flare of her disease and was always afraid for ‘accidents’. This happened to her that night as well and she stopped going out. After her J-pouch surgery this suddenly changed and she was able to take part in all activities again and regained her quality of life. This is where my interest in inflammatory bowel diseases (IBD) started. Moreover, the technical part of the J-pouch surgery fascinated me.

In 2014 during a one-week junior rotation at the surgical department I came into contact with prof. dr. W.A. Bemelman, a colorectal surgeon specialized in minimally invasive surgery in colorectal cancer and IBD patients. Thereafter he supervised me for my bachelor’s thesis and arranged a scientific research internship for my master’s degree at the St Mark’s Hospital in London, a specialized IBD hospital. During the week I did research on J-pouch surgery and every Friday I had the opportunity to go to the theatres (i.e. operation rooms) and observe all kinds of surgeries for IBD. Back in Amsterdam I started with my rotations, which I really enjoyed. However, I missed doing research. One year later prof. dr. W.A. Bemelman informed me about a vacancy as PhD candidate in his team, and I got the job!

In order to work as a full time PhD candidate, I had to temporarily quit my studies. Even though the study advisors were sceptic about this aberrant trajectory, it was quite easy to arrange it all. For two years and nine months I worked at the department of Surgery and the department of Gastroenterology & Hepatology in the Amsterdam UMC, location AMC, under supervision of prof. dr. W.A. Bemelman, prof. dr. G.R.A.M. D’Haens and dr. C.J. Buskens. Our research focused on new and established surgical treatment options for ulcerative colitis and perianal Crohn’s disease. I coordinated two large multicenter randomized controlled trials which were initiated earlier and I received a ZonMw grant for a follow-up study; the COSTA study. This study will further evaluate the influence of an appendectomy on ulcerative colitis, as we hypothesize (and already confirmed in some studies) that this might have a positive effect on the disease course of ulcerative colitis.

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“Even though the study advisors were sceptic about this aberrant trajectory, it was quite easy to arrange it all.”

Only after publishing most of my manuscripts, I continued with my rotations. As we all know working in the field of medicine can be tough, requiring long days in the hospital. Therefore, I would really advise to first finish most of your PhD before continuing with clinical work. Last year I (finally :) ) finished my rotations and one month later I defended my PhD. It requires some effort, but it is definitely possible to request a PhD defense date or even defend it without having your master’s degree. For the last two months I have been working as a resident at the department of surgery in the OLVG Oost. To keep my affinity with research and a second passion of mine, creativity, I am now part of the AMSj editorial board as creative editor.

As I had an amazing time during my PhD, I would definitely do it again and I would recommend it to everyone. Make sure you research a subject you’re genuinely interested in, ask for help from more experienced colleagues, and most of all be part of a team. By working together and collaborating in (inter)national projects it is much easier to make a change.
Dependence on Foreign Medical Supplies in the Netherlands was a Contributing Factor in Early Failure of COVID-19 Pandemic Control

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1. FACULTY OF MEDICINE, AMSTERDAM UNIVERSITY MEDICAL CENTER, LOCATION VUMC, VU UNIVERSITY

Would the outbreak of the COVID-19 pandemic have been more manageable and controlled more quickly if all medical supplies would be manufactured in the Netherlands? The partly unexpected, massive and acute outbreak has caused manufacturers and distributors of medical devices to contend with large inventory shortages. In the Netherlands, the Landelijk Consortium Hulpmiddelen (LCH) purchases many of these supplies, such as FFP1, FFP2 and the high-quality FFP3 masks, disinfectants, diagnostic tests, equipment and respirators, in non-European countries. Due to the globally increased demand and usage of these supplies, shortages quickly arose in various branches of the medical and non-medical community. As a result, protective equipment was withheld from healthcare workers in the field. Consequently, the coronavirus outbreak could not be prevented or controlled properly in the Netherlands, partly due to a reduced import and increased demand of medical supplies, and a decrease in quality.

Firstly, the Netherlands purchases many medical supplies from abroad, mainly China, which are primarily delivered by air. However, as air traffic causes increased virus spread, measures were taken to reduce the number of flights. This not only resulted in a rapidly emerging shortage of medical devices but also in rising costs of transport by plane. Therefore, this could make the import of medical supplies less feasible as each country is either combating the disease or already overburdened to supply medical supplies to other countries. This exemplifies the importance of increasing the domestic production of medical supplies to combat COVID-19, or any pandemic.

In the beginning, it was strenuous to determine whether a patient was infected and what the specific virulence of the virus was. Therefore, calculations on how much supplies would be needed to treat the infected failed utterly. There was simply not enough knowledge available to determine and predict how fast the virus would spread and what the consequences would be for obtaining equipment. Moreover, it is extremely difficult to determine in advance whether a patient is infected with the virus because the symptoms differ per person and between different age groups. For this reason, it is important that every hospital employee wears appropriate protection with every contact. Additionally, the ongoing number of infected patients has increased the need for intensive care capacity, due to the increased demand for respirators and other devices to treat infected patients under critical conditions. Because of this increased demand and shortage of medical supplies, this could not be achieved and this may have led to an increased virus spread.

Due to the globally increased demand for medical supplies such as mouth masks, large quantities were ordered from medical supply producing countries, mainly China. This resulted in an extremely high workload for producers and distributors. Because they wanted to deliver these products as quickly as possible during such a critical period, the quality of the products deteriorated. Subsequently, the purchased mouth masks did not meet the requirements upon arrival in the Netherlands. Additionally, medical masks have to meet much more stringent requirements than civil masks. Eventually, there were enough of these civil masks produced by many new Chinese factories, but this was not the case at the beginning of the outbreak. It would be useful if the Netherlands controls production and immediate testing of the products.

On the other hand, it is much more expensive to arrange this production of medical devices in the Netherlands. Therefore, the Netherlands purchases these products from China, since economies-of-scale is achieved better in China, which results in a much lower purchase price. Consequently, buyers can purchase medicine and medical devices worldwide at low costs. Once production remains within Europe, the production costs will increase. However, this reduces the risk of an insufficient and unreliable supply chain, which eventually will also result in shorter delivery times. Because of this, any outbreak would be more rapidly under control and would not get out of control as quickly as it did with this coronavirus pandemic.

In conclusion, I believe that if the Netherlands was not so dependent on foreign medical supplies, the SARS-CoV-2 virus would not have been able to spread at the speed it did. This was not the first pandemic and therefore the Netherlands should have taken the Chinese reports of December 2019 more seriously. This goal of early control can be reached in future outbreaks if most of our medical supplies are produced in either neighboring countries or in the Netherlands itself. It is of great importance to put quality over quantity and introduce policies to acknowledge the fact that we need to increase domestic production of medical devices in order to anticipate future outbreaks.

REFERENCES
In the Van Weel-Bethesda Hospital in Dirksland, I ran into... Jolanda Tessers - van Gorsel, wound care nurse

What is your current profession?
I have been a wound care nurse for 15 years, and I have been working in the Van Weel-Bethesda Hospital in Dirksland for seven years now. After I became qualified as a nurse, I followed training in Dermatology at the UMC in Utrecht, and Wound Care at the Radboud UMC in Nijmegen.

What are your work-related activities?
I mainly see patients in the outpatient clinic at the General Surgery Department. I perform wound care regarding post-operative problems, skin infections, traumatic skin injuries, chronic wounds, diabetic feet, ulcers cruris, and wounds related to casts for bone fractures. One day a week, I see patients at the Dermatology Department concerning open legs, venous insufficiency, dermatologic disorders, and postoperative healing problems after excision of skin malignancies. Moreover, my expertise is requested regarding patients on the clinical wards. After wound evaluation, I compose a treatment plan and hand this over to the nurses on the ward. When patients are discharged from the hospital, I arrange professional home care when indicated and I invite patients at the outpatient clinic for adequate follow-up.

What is your main task?
It is essential to listen carefully to each patient and to pay attention to patients’ individual contexts. It is relevant to mention that we see patients who have been admitted to the ICU due to COVID-19. Some patients develop decubitus ulcers up to stage 4. Reconstructive procedures might be indicated, such as rotation flap surgery, in order to repair the defect. In addition, I am involved in wound care regarding traumatic skin defects around joints. Healing of these wounds might be complicated due to tissue scarring, in which skin contractures could limit joint function. Moreover, I see post-operative patients after surgery of skin malignancies for which skin grafts are used. When graft failure occurs, I am involved in post-operative wound care.

What do you like most about your profession?
I like unexpected requests for consultation regarding traumatic wounds, or wounds caused by casts for bone fractures. Besides this, I like to help and calm down desperate patients who visit our outpatient clinic with high thresholds, and have in mind worst-case scenarios like amputation. These situations are difficult. I also want to keep developing myself and learning new things. A while ago, I applied for the internal training for plaster cast nurse. I would start training next month. Unfortunately, I decided to withdraw due to restrictions caused by COVID-19. All lessons would be online, and I certainly prefer to get training on location.

What is your main task?
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What are your ambitions?
Currently, I lead the project ‘New Bandages’, in collaboration with the Purchase Department. I give courses and introduce new protocols. Besides this, I have completed all courses for this job. However, I must challenge myself to improve temporary care and to search for new developments.

Do you contribute to scientific research?
We are regularly approached for collaboration regarding scientific studies. Currently, we are contributing to a study regarding pilonidal sinuses for which the elet lift procedure results in fewer recurrences.

Which difficult decision have you made?
Sometimes we send patients home with the advice to think about treatment options such as lower extremity amputation. These situations are difficult. I also want to keep developing myself and learning new things. A while ago, I applied for the internal training for plaster cast nurse. I would start training next month. Unfortunately, I decided to withdraw due to restrictions caused by COVID-19. All lessons would be online, and I certainly prefer to get training on location.

What are the challenges of your profession?
To keep up with new developments, and to keep developing myself. I have been doing this job for quite a long time and I am very familiar with all protocols. Besides this, I have completed all courses for this job. However, I must challenge myself to improve temporary care and to search for new developments.
Sharing is caring - A narrative review and recommendation: Improving health data sharing between healthcare professionals in the Netherlands utilizing electronic patient records

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ABSTRACT

In terms of sharing electronic health records (EHR), healthcare professionals in the Netherlands deal with poor interoperability between different data systems and complicated organization of obtaining and registering patients' consent. These difficulties can lead to treatment delay, complicated interhospital collaboration and an increased burden of administrative tasks for healthcare professionals. This paper aims to provide insight into the factors holding back data exchange in healthcare and propose a new way to improve the exchange of health data.

The main barriers in easing EHR data exchange are non-interoperable EHR systems, tight privacy laws and the lack of trust from patients and healthcare professionals. Inspirational incentives are being developed in the Netherlands and abroad that could offer a solution to these problems.

The presented incentives show that different systems can be developed to facilitate interoperability between data systems and that governmental guidance can promote adoption of information standards. Moreover, they show that providing patients with control over their records might be an effective way to increase perceived privacy. A decentralized system might be less susceptible to privacy violation.

INTRODUCTION

When exchanging electronic health records (EHR), healthcare professionals deal with poor interoperability between different data systems and complex organization of obtaining and registering patients' consent.1 Sharing patient information between healthcare professionals could be made more efficient, while maintaining high privacy standards.

Since April 2020, it has been possible for emergency posts to gain access to the general practitioner’s patient record without consent in case of the patient's inability to do so, using an opt-out approach. The COVID-19 crisis showed us that changes within healthcare in The Netherlands can take place quickly.

This raises the question: How can we improve the exchange of patient information by means of electronic health records (EHR) between different healthcare professionals in The Netherlands?

Difficulties holding back EHR exchange

Multiple barriers to EHR sharing in the Netherlands exist. First, different EHR data systems made by different companies are used between hospitals, making it technically difficult to link all programs.2 Second, EHR sharing is regulated by privacy laws, such as the European law “General Data Protection Regulation” (GDPR). The GDPR states that the patient’s consent is required to share medical data between medical professionals.3 Third, patients’ concerns regarding privacy violations arise. The cause of concern is the use of medical information by a third party, especially healthcare insurance companies.4 Another issue that may have driven the public point of view is the lack of information available.5 Last, many medical professionals have a critical attitude towards nationwide EHR, the argument being concerns about the risk of privacy violations.6 The fear does not only relate to the acquisition of information by a third party but also to medical professionals who could abuse their access to records.7 The most known example is of medical professionals peeking in to celebrities’ medical records, such as those of George Clooney, Prince and the Dutch Barbie.8,9

Dutch initiatives to improve EHR exchange

There are multiple initiatives that have been proposed in the Dutch health care system. One of these initiatives is the Nationwide Transfer point, Landelijk Schakelpunt (LSP), which is not a database, but a medium through which consulting the EHR system of another caregiver is possible. Medical professionals can only use LSP with explicit consent of the patient (opt-in). Also, medical professionals can only request information within their own region. Patient data is shared in the form of Professional Summary (PS) which is a summary of a patient file, standardized by the National General Practitioners’ Society.10 However, the Dutch central bureau of statistics found that there were concerns about privacy violation and lack of security.11 Following public opinion, the Dutch senate voted unanimously against implementation of a nationwide EHR system.12

Another initiative, Whitebox Systems, provides the possibility to choose which medical professional uses a patient’s data. Access is given via an app or code, which is provided by the patient. Because patient data are retrieved from the EHR of a medical professional and not from a central server, the protection of this data is covered by the professional secrecy of the given medical professional. Thus, a decentralized system. Also, Whitebox uses an adapted form of PS, which includes less patient data.13

Yet another format currently being tested is patient-controlled EHR. In these EHR, the patient is in charge of their own file.14 The ease with which data can be requested by a healthcare professional is yet to be determined. An initiative of the Ministry of Public Health and Wellbeing, MedMij acts as a hallmark for these EHR to ensure the safety of data sharing. However, medical professionals can not directly share data without interference of the patient.15 Another possible downside of this format might be the lack of medical expertise in the general population, leading to inaccurate files.

Inspiration from abroad

In comparison to other countries, the Netherlands is a leader in digitalization and implementation of EHR.16 However, opportunities for further development of data exchange can be inferred from successful initiatives abroad.

Reports from Norway, Estonia and Finland show that nationwide systems exist and can effectively enable interoperability between all healthcare institutes. They function as either a translating platform or a centralized database.20,21 The approach to minimize privacy issues is characterized by enabling patients to give access permission to relevant caregivers promptly, in an effortless way, as well as to monitor their files and who has had access.

CONCLUSION

In the Netherlands the main barriers to simplifying the EHR data exchange are the European privacy legislation and the lack of trust from patients and healthcare professionals in the safety of EHR exchange systems.

There have been several initiatives to create a better system in the Netherlands, but all have their drawbacks. LSP only has a regional scope, Whitebox does not have a fast and easy way to operate in emergency situations, and MedMij.nl requires a patient that updates and maintains their own file, possibly resulting in incomplete files.

In countries around us systems for data exchange have been successfully and safely implemented. Differences in infrastructure and the public opinion seem to be reasons why similar systems have yet to be implemented in the Netherlands.

RECOMMENDATION

Considering the information presented in this paper, a recommendation can be formulated to improve the exchange of EHR between different healthcare professionals in the Netherlands.
We conclude that a decentralized sharing system is the best option to aggregate all data. A decentralized system, which works in the same manner as Whitebox, reduces chances of privacy violation by unauthorized access through division of data over multiple servers, each located in different health institutions. A system that functions as a sharing platform and translator of data from different sources could serve as a safer alternative. The system can be accessed by medical professionals with their General Medical Council number. In this way it is possible to monitor who consulted with their General Medical Council number. In a system can be accessed by medical professionals over multiple servers, each located in different centralized system, which works in the same manner as Whitebox, reduces chances of privacy violation by unauthorized access through division of data over multiple servers, each located in different health institutions. A system that functions as a sharing platform and translator of data from different sources could serve as a safer alternative. The system can be accessed by medical professionals with their General Medical Council number. In this way it is possible to monitor who consulted with their General Medical Council number. We conclude that a decentralized sharing system is the best option to aggregate all data. A decentralized system, which works in the same manner as Whitebox, reduces chances of privacy violation by unauthorized access through division of data over multiple servers, each located in different centralized system, which works in the same manner as Whitebox, reduces chances of privacy violation by unauthorized access through division of data over multiple servers, each located in different.

REFERENCES


A young man with a distinctive trauma sign

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CASE
A 31-year-old gentleman is presented at the ER after a high energetic trauma. No previous medical history was documented. On presentation, he was conscious, breathing and vitally stable. His main complaint was pain in the lower back and abdomen. At physical examination, the following linear discoloration was seen. The abdomen showed mild generalized tenderness. He also had an open fracture of the right elbow.2

REFERENCES


QUESTION 1
What is this phenomenon called?
A. Linear bruise sign
B. Steering wheel syndrome
C. Seatbelt sign
D. High velocity mark

Hints:
A. The observed skin defect is more extensive than a linear bruise only.

B. Although the bruise looks like it is circular, it is unilateral and this pattern is not expected from an impact by the steering wheel.

C. This is the correct answer. The seat belt sign is a pattern of bruising corresponding with the place of the seatbelt. It stretches in a horizontal line along the waist and the diagonally to the clavicle or neck. The most common internal injuries, as a result of this force, are bowel and mesenteric injuries together with lumbar spine fractures.

D. Although a bigger change in velocity often results in more damage, the name of this sign is more specific for the cause of this bruising pattern.

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REFERENCES


2. Disease can be different in men and women, and every physician should remain aware of that fact.

A rheumatology professor once said: “Disease can be different in men and women, and every physician should remain aware of that fact.”

That professor was Prof. Dr. I.E. van der Horst-Bruinsma, Department of Rheumatology, AUMC, Amsterdam. We were privileged to ask her about her career, passion for rheumatology and the reasons she has been such a strong advocate for the awareness of gender differences in (rheumatic) disease.

What drew you to Rheumatology?
I wanted to do something that was not too narrowly defined, but still had a clearly defined focus without sacrificing the interconnected nature of medicine. Despite initially looking at dermatology/opthamology, I realized that rheumatology was both clearly defined as a field, and not isolated to a single organ. It was (and is) one of the medical fields most broadly integrated with others like gastro-enterology, internal medicine and many more.

Is there something you are particularly proud of?
I am proud of the growing cooperation between the departments of Ophthalmology and Rheumatology, as these can overlap in several diseases and early detection, referral and treatment are of paramount importance. Of course, I am also proud of the work I have done with the EULAR (European League Against Rheumatism) to promote awareness of gender differences in rheumatic disease and the progress made therein. There is, however, still a long way to go.

What would you advise students and your researchers?
I would advise them to think critically about all information they receive and to not blindly accept everything they read in an article. Of course, I would advise them to remain aware of gender differences and to incorporate these into both clinical practice and future research.

What kind of medical student were you during your studies?
I was a conscious student, but also a member of a student society, with many social activities. As a result of these characteristics, I nearly always went to lectures, but I didn’t sit in the front row.

Why did you choose to focus on gender differences in rheumatic disease?
During my medical education I came across several cases with severe ankylosing spondylitis (AS, Bechterew disease) who were referred to rheumatology by orthopedic surgeons. These also included female patients who presented with a disease severity which was completely opposite to what was known in literature up to that point, which described AS as having a mild course in women.

In addition, several female patients proved to have rheumatic diseases while they were misdiagnosed with for example fibromyalgia instead of axial spondyloarthritis. The presentation simply differed too much from known patterns, which were mostly based on early research in such diseases with male-biased populations.

“Rheumatology is one of the medical fields most broadly integrated with others.”

How do you want to draw more attention to gender differences in rheumatic diseases?
I am active as board member of the Dutch Society of Gender and Health (Ned. Vereniging van Gender en Gezondheid). We are now working on a plan to create more awareness on gender differences. In addition, I am also politically active by contributing to the Tweede Kamer nota on Gender Sensitive health care and at EULAR to draw more attention to gender differences and equal representation in both studies and policy positions.

Next to gender differences, are there other areas in rheumatology that deserve more attention?
Despite great progress in the treatment and understanding of axial spondyloarthritis, there is currently still no quantitative functional test or measurement possible. Our clinical evaluation is still very much based on questionnaires and self-reporting from patients. I hope to see this change in the future, to a more independent and reliable measurement of disease.
Primum non nocere
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Globally, there is a growing number of older adults, persons of 65 years and over. Typically, older persons have multiple coexisting conditions for which they use medication. Consequently, nearly half of older adults have polypharmacy, the chronic use of five drugs or more daily. Polypharmacy is associated with adverse drug effects, leading to negative outcomes such as cognitive decline, falls, unplanned hospital admissions, and even death. Both the risks and benefits of medication use change with time and the ageing process. In general, older adults are more susceptible to adverse drug effects compared to their younger counterparts. Evidence suggests that one out of every five medications taken by an older adult is inappropriate (a medication where the harms outweigh the benefits or that does not fit with the treatment goals and preferences of the individual).1,2

In 2017, the World Health Organization launched a global initiative aiming to reduce the level of drug-related severe, avoidable harm by 50% over the next 5 years. To achieve this goal, it is necessary to critically review current medications, and to withdraw (or reduce the dose) of inappropriate medication, supervised by a healthcare professional, aiming to achieve better health outcomes. This process is called deprescribing, a term first coined in 2013. Despite growing interest in deprescribing over the last decade, and literature showing promising results on the effect of deprescribing (e.g. improvements in cognition, fewer falls and improved survival), deprescribing is currently underutilized in clinical practice.

Literature shows that prescribers may be reluctant to deprescribe because they perceive their knowledge to be insufficient. Also, emotional and psychological aspects are involved: deprescribing may go against our belief that a good medical doctor is supposed to heal diseases by ‘giving something’. Also, from the patients’ point of view, the ‘drugs equals health’ mindset can be a deep-rooted value. Moreover, deprescribing can be perceived by the patient/carer as being “given up on”. To overcome these challenges, a culture change is needed, starting in medical education, where more focus should lie on the process of deprescribing and the underlying aim of maintaining the best quality of life. In fact, the WHO states that “one component of good prescribing is deprescribing”. Therefore, deprescribing fits in our basic goal of achieving quality care while complying to our ethical principle “primum non nocere”.

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Radiology image: Knee complaints after surgery
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2. DEPARTMENT OF RADIOLOGY, AMSTERDAM UMC, LOCATION AMC

CASE
A 30-year-old football player presents at the GP with sudden complaints of the knee. He recently underwent surgery due to an injury acquired during a football game, however he is unsure what procedure was performed exactly. An MRI of the knee was made.

QUESTION 1
What do you see?
A. Lateral notch sign
B. Defect in the fat body of Hoffa
C. Cyclops lesion
D. Arcuate sign
E. Bucket handle tear

Hint: What does it look like?

QUESTION 2
What surgery was most likely performed?
A. PCL procedure
B. ACL procedure
C. Partial meniscectomy
D. Hemi knee

Hint: What kind of injury do you expect with the sports history?

QUESTION 3
What would be the patient’s chief complaint?
A. Limited extension of the knee
B. Inability for exorotation of the knee
C. Limited endorotation of the knee
D. Limited flexion of the knee
E. Instability

Hint: How are movements in the knee produced? What structures are involved in the movement and in which of these structures is the lesion located?

What structures are involved in the movement and in which of these structures is the lesion located?
INITIATIVES WITH IMPACT

Early defibrillation in the community: an initiative with impact

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BACKGROUND

I am (was) a clinical cardiologist in the Academic Medical Center, always with an interest in acute medicine. In cardiology there are many opportunities for that: acute myocardial infarction is the prime example, because there is indeed a “golden hour” for early intervention to save myocardium. “Time is muscle” is a well-known statement.

Between 1978 and 1984 I intensively collaborated with the Amsterdam Ambulance Service in a randomized trial to try to prevent sudden death in the ambulance from ventricular fibrillation. During that process I became interested in ventricular fibrillation itself. Knowing that many victims of an acute myocardial infarction die from cardiac arrest due to ventricular fibrillation before an ambulance can arrive, it became clear that for cardiac arrest there is no golden hour but only a few golden minutes. Any help and electrical defibrillation that would be given later than 5 to 10 minutes after collapse would almost certainly result in death.

The police-AED study

From the findings of our first study on cardiac arrest the idea emerged to introduce AEDs to allow non-medical persons to defibrillate before ambulance arrival. But such a new system would only be accepted in the community and by medical professionals once its effectivity and safety had been proven in a scientific study. Because of the wide spread of cases with cardiac arrest in the community, unpredictability where they would occur and the inability to obtain thousands of AEDs and train thousands of volunteers, we decided to ask police and firefighters to be our “study group” to test the AED and to ask the ambulance dispatch centers to notify police and firefighter dispatch centers in case of a possible cardiac arrest. As police and fire engines are more densely distributed within the community than ambulances, it was expected that they would arrive several minutes earlier. Police forces of Kennemerland and Zaanstreek-Waterland and the firefighters of Amsterdam-Amstelland agreed to participate.

FIGURE 1 Example of the start of an AED registration. At A, the electrodes of the AED are connected and the rhythm analysis begins. At B (9 seconds later), the AED has determined that there is a “shockable” heart rhythm and the AED charges itself. At C, the rescuer delivers a shock. The heart rhythm is immediately present again. At D chest compressions are started at a speed of approximately 105 per minute, recognizable by the green line. Each time mark indicates one second. Figure reproduced with permission from the publisher from literature reference 9.

“Any help and electrical defibrillation that would be given later than 5 to 10 minutes after collapse would almost certainly result in death.”

The community would be the ideal context for its use because of the long delay for ambulance help in case of cardiac arrest. Public access to AEDs could be a possible solution to the problem of poor survival after cardiac arrest.

Value of the Automated External Defibrillation

Traditionally, electrical defibrillators were only available in hospitals and since the early 1970s in ambulances. When our study was finished in 1999 the first Automated External Defibrillators (AEDs) had just been developed in the USA. AEDs have an internal algorithm that can recognize ventricular fibrillation automatically and do not require the expertise of professionals. (FIGURE 1) Therefore, accepted in the Netherlands

The success of the AED in the Netherlands was fast. Many offices, sport facilities, shops etc. purchased AEDs and trained their personnel. We could document the increased use of AEDs in public and prove that the observed increase in survival could be attributed to the increased deployment of AEDs. After that, the AED was introduced nationwide by police in 2009, and to local nearby volunteers, activated by text-message from the dispatch center (burgerhulpverlening). We could document the expected reduction in time to defibrillation when these text-message responders were activated.

Next, finances were needed. We needed money to purchase AEDs, to hire data managers to record in detail all actions taken in the early response to the cardiac arrest, for a car to go to the used AED to download the recorded data in the AEDs with all detailed time points, etc. Not to forget the PhD student who needed to do all management, data analysis and writing of scientific papers! It took a full year before we had approval from the Dutch Heart Foundation. They funded the study with a record amount of €600,000 over four years. We also had to make a choice between potential AED manufacturers and found the best scientific support from the American company Physio Control, the manufacturer of the first AED LifePak 500.

But it did not end there. We needed approval from the Medical Ethics Board to conduct a randomized trial. And there was a hurdle we had not expected: after having finalized all preparations, the National Health Inspectorate did not consent to the study because the BIG law did not allow police and firefighters to defibrillate. It was for medical personnel only, according to the BIG law. It took a year to convince the Health Inspectorate that the study could be approved under certain conditions. We performed the study successfully, and published it in 2003 with proof of effectivity and safety.

We could convince the Minister of Health to add to the BIG law to allow AED use for lay rescuers.

Accepted in the Netherlands

The success of the AED in the Netherlands was fast. Many offices, sport facilities, shops etc. purchased AEDs and trained their personnel. We could document the increased use of AEDs in public and prove that the observed increase in survival could be attributed to the increased deployment of AEDs. After that, the AED was introduced nationwide by police in 2009, and to local nearby volunteers, activated by text-message from the dispatch center (burgerhulpverlening). We could document the expected reduction in time to defibrillation when these text-message responders were activated.
Regression Analysis: the key method to analyse medical data

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Although there are many, many different statistical methods available to analyze medical data, most of these methods are built on the basic principles of regression analysis. So, it is quite important to understand these basic principles. There are many different regression methods available and the details differ depending on the kind of outcome variable used. When the outcome variable is a continuous outcome (e.g., blood pressure, BMI, etc.) linear regression analysis must be used, but when the outcome variable is dichotomous (e.g., depression, myocardial infarction, etc.) logistic regression analysis must be used. Besides logistic and linear regression analysis, there are many more regression analyses available; however, the most simple way to explain regression analysis is by linear regression analysis. Suppose we want to analyze the relationship between body mass index (BMI) and physical activity. In statistical nomenclature, BMI is known as the outcome variable, while the dependent variable or the y-variable, while physical activity is known as the independent variable, the x-variable or the covariate. The first step in the analysis is to display the data in a scatterplot, which contains the observed data. Then, a straight line has to be drawn through the observations and the characteristic of the line is that the distance between the line and the observed values is as small as possible. This line is then characterized by two parameters, the b0 and the b1. The b0 (known as the intercept) reflects the value of BMI when physical activity equals 0 and the b1 reflects the difference in BMI when physical activity differs with one unit (see FIGURE 1).

One of the advantages of using regression analysis is that adjustments for potential confounders can be made and that potential effect modification can be investigated. Confounding indicates that the relationship which is observed is partly caused by something else (e.g., sex). In FIGURE 2, the black dots indicate females, while the blue dots indicate males. It can be seen that physical activity is higher for males, while BMI is lower. Because of that, the earlier observed relationship between BMI and physical activity is totally caused by sex differences. In the lower part of FIGURE 2 it can be seen that the relationship between BMI and physical activity is reduced to zero when an adjustment is made for sex. It can also be seen that adjusting for sex in a regression analysis actually means that for both males and females a different intercept is estimated (b0 = 12) for males and b0 + b3 = 18 for females).

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It should be realized that regression analysis can be used for continuous independent variables such as physical activity, but it can also be used for dichotomous and categorical independent variables. The basic principles of regression analyses are always the same.
**Answers ‘Knee complaints after surgery’**

**Sanne van Beem and Mario Maas**

Correct answers: 1C, 2B, 3A

**EXPLANATION**

The patient underwent an ACL procedure, which can be seen by the presence of a tibial tunnel indicated by the arrow, as a result of an ACL injury acquired during a football game. ACL injuries are common in sports involving pivoting, decelerations and jumping, and are often preceded by an exorotation in valgus trauma. ACL injuries present with instability and require surgery if this hampers patients in their daily life. One possible complication of an ACL procedure is a cyclops lesion in which a nodule of granulation tissue surrounded by fibrous tissue is formed from several structures in the knee, including the bone, the infrapatellar fat pad, synovium, cartilage and fibrous tissue. Cyclops lesions often progress into fibrocartilaginous soft tissue. The exact pathophysiology is unknown, but is most likely the result of debris that is formed during drilling the tibial tunnel or due to the impingement of ACL fibers that are exposed during the surgery. The cyclops lesion derives its name from the resemblance to the eye of the homonymous mythical creature. This lesion prevents extension of the knee as in this movement the intra-articular space decreases. Lesions are removed arthroscopically.

**REFERENCES**


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**Colophon**

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ISSN 2589-1243 (print); 2589-1251 (online)

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AMSj Vol. 22 | March 2021