

Martin Müller

PD Dr. med., Dipl.-Math., Ph.D. M. Sc.
Senior researcher and Senior consultant
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Research statement

My research contributes to better understanding and improving acute care medicine. I have a special research focus on the development and understanding of risk scores for diagnosis and risk prediction problems using different prediction tools such as decision trees, regression analysis and machine learning algorithms. I also work on systematic reviews and meta-analyses, as they represent the highest level of evidence-based medicine. I am leading the Method(ology) laboratory of our emergency department (ED), specialized in methodological questions about research in acute care medicine. Furthermore, I study the resource allocation and resource consumption of ED patients.

Education

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|-------------------|--|
| 09/2020, 01/2021 | Point of Care Ultrasound: Emergency Medicine
(POCUS Basisnotfallsonographie und fokussierte transthorakale kardiale Sonographie, SGUM, Supervisor) |
| 11/2019 | Venia docendi for “Emergency Medicine” (<i>Privatdozent/Habilitation</i>)
University of Bern, Switzerland |
| 03/2018 – 12/2020 | Ph.D. in Health Sciences
Institute of Health Economics and Clinical Epidemiology, University Hospital of Cologne, Cologne, Germany. Advisor: Prof. Dr. S. Stock |
| 12/2015 – 08/2019 | Sub-specialisation in Emergency Medicine (<i>“Interdisziplinärer Schwerpunkt Klinische Notfallmedizin”</i>)
Swiss Society of Emergency and Disaster Medicine (SGNOR/SSERM) |
| 04/2012 – 11/2017 | Specialisation in general internal medicine (<i>“Facharzt FMH”</i>)
Swiss Society of General Internal Medicine (SGAIM) |
| 10/2014 – 11/2016 | Masters in Epidemiology (M.Sc.)
London School of Hygiene and Tropical Medicine, United Kingdom
Distance learning programme, including blended learning at the LSHTM, London
02/2016 – 04/2016. Advisor: H. Carreira Ph.D. M.Sc. |
| 05/2007 – 03/2012 | Doctorate (Dr. med., 07.03.2012)
Department of Orthopedics and Trauma Surgery, University of Cologne & Institute of Biomechanics and Orthopaedics, German Sport University Cologne, Germany. Advisors: Prof. Dr. G.-P. Brüggemann, Prof. Dr. P. Eysel. |
| 10/2005 – 10/2011 | Study of Human Medicine
University of Cologne, Germany
26.10.2011: Medical state examination, 11/2011: Approbation |

10/2003 – 04/2009 **Diploma in Mathematics**
University of Cologne, Germany. Advisor: Prof. B. Kawohl
Research priority: Applied mathematics

Employment history including current position

Since 04/2019 **Senior researcher and Senior physician in Emergency Medicine (03/2020)**
Department of Emergency Medicine
University Hospital Bern (Inselspital), Switzerland
Advisors: Prof. Dr. W. Hautz, Prof. Dr. A. Exadaktylos

07/2019 – 01/2020 **Resident in Anaesthesiology (60%)**
Department of Anaesthesiology and Intensive Care
University Hospital Bonn, Germany

04/2018 – 06/2019 **Senior physician in Emergency Medicine (50%)**
Department of Internal Medicine
Spital STS AG Thun, Switzerland

04/2018 – 03/2019 **Visiting researcher (50%)**
Institute of Health Economics and Clinical Epidemiology
University Hospital of Cologne, Cologne, Germany

12/2015 – 03/2018 **Resident (till 03/18) & research fellow in Emergency Medicine**
Department of Emergency Medicine
University Hospital Bern (Inselspital), Switzerland

04/2012 – 10/2015 **Resident in Internal Medicine**
Department of Internal Medicine
University Hospital Bern (Inselspital), Switzerland (04/2014 – 10/2015)
fmi Spital Interlaken, Switzerland (04/2012 – 04/2014)

Institutional responsibilities

Research, teaching including supervision of master thesis and dissertations, conduct and administration of non-sponsored & sponsored projects, acquisition of funding, professional practice.

Supervision of junior researchers at (post-)graduate level

Finished master thesis/dissertations:

E.-M. Moser (2016), J. Wyler (2016), R. Seidenberg (2016), N. Saegesser (2019), F. Bosshard (2019), C. von Rütte (2019), J. Münster (2020), S. Wildbolz (2020), R. Stuber (2021), M. Gardill (2021), A. Huser (2021), M. Traschitzger (2022), T. Suppiger (2022), L. Garweg (2022).

On-going master thesis/dissertations: T. Flury, T. Nguyen, N. Saegesser, A. Kieser, M. O. Zindel, L. Lanter, R. Massy, E. Bernasconi.

Publications

Original research

First/Senior author

- 1 Niehoff A, **Müller M**, Brüggemann L, Savage T, Zaucke F, Eckstein F, Müller-Lung U, Brüggemann GP. Deformational behaviour of knee cartilage and changes in serum cartilage oligomeric matrix protein (COMP) after running and drop landing. *Osteoarthritis Cartilage*. 2011;19(8):1003-1010. (shared first authorship)
- 2 **Müller M**, Moser EM, Pfortmueller CA, Olariu R, Lehmann B, Exadaktylos AK. Aetiology of adult burns treated from 2000 to 2012 in a Swiss University Hospital. *Burns*. 2016;42(4):919-25.
- 3 **Müller M**, Klingberg K, Srivastava D, Exadaktylos AK. Consultations by Asylum Seekers: Recent Trends in the Emergency Department of a Swiss University Hospital. *PLoS ONE*. 2016;11(5):e0155423.
- 4 **Müller M**, Gloor B, Candinas D, Malinka T. The 100 Most-Cited Articles in Visceral Surgery: A Systematic Review. *Dig Surg*. 2016;33(6):509-19.
- 5 **Müller M**, Guignard V, Schefold JC, Leichtle AB, Exadaktylos AK, Pfortmueller CA. Utility of quick sepsis-related organ failure assessment (qSOFA) to predict outcome in patients with pneumonia. *PLoS ONE*. 2017;12(12):e0188913.
- 6 **Müller M**, Ricklin ME, Weiler S, Exadaktylos AK, Arampatzis S. Emergency medicine in the extreme geriatric era: A retrospective analysis of patients aged in their mid 90s and older in the emergency department. *Geriatr Gerontol Int*. 2018;18(3):415-420.
- 7 **Müller M**, Schefold JC, Guignard V, Exadaktylos AK, Pfortmueller CA. Hyponatraemia is independently associated with in-hospital mortality in patients with pneumonia. *Eur J Intern Med*. 2018;54:46-52.
- 8 **Müller M**, Jürgens J, Redaelli M, Klingberg K, Hautz WE, Stock S. Impact of the communication and patient hand-off tool SBAR on patient safety: a systematic review. *BMJ Open*. 2018;8(8):e022202.
- 9 **Müller M**, Klingberg K, Wertli MM, Carreira H. Manual lymphatic drainage and quality of life in patients with lymphoedema and mixed oedema: a systematic review of randomised controlled trials. *Qual Life Res*. 2018;27(6):1403-1414.
- 10 **Müller M**, Seidenberg R, Schuh SK, Exadaktylos AK, Schechter CB, Leichtle AB, Hautz WE. The development and validation of different decision-making tools to predict urine culture growth out of urine flow cytometry parameter. *PLoS ONE*. 2018;13(2):e0193255.
- 11 **Müller M**, Schlittler F, Schaller B, Nagler M, Exadaktylos AK, Sauter TC. Characteristics, treatment and outcome of bleeding after tooth extraction in patients on DOAC and phenprocoumon compared to non-anticoagulated patients - a retrospective study of emergency department consultations. *Clin Oral Investig*. 2019;23(5):2273-2278.
- 12 **Müller M**, Exadaktylos AK. Injuries After Oldtimer Accidents: Eighteen Years Experience in the Emergency Department of a Swiss University Hospital. *J Acute Med*. 2019;9(2):73-76.
- 13 **Müller M**, Nett PC, Borbély YM, Buri C, Stirnimann G, Laederach K, Kröll D. Mental Illness Has a Negative Impact on Weight Loss in Bariatric Patients: a 4-Year Follow-up. *J Gastrointest Surg*. 2019;23(2):232-238.
- 14 **Müller M**, Schefold JC, Leichtle AB, Srivastava D, Lindner G, Exadaktylos AK, Pfortmueller CA. qSOFA score not predictive of in-hospital mortality in emergency patients with decompensated liver cirrhosis. *Med Klin-Intensivmed*. 2019;114(8):724-732.
- 15 Brown AD, **Müller M**, Hirschi T, Henssler JF, Rönz K, Exadaktylos AK, Srivastava D. Acute and mixed alcohol intoxications in asylum seekers presenting to an urban emergency department in Switzerland. *BMC Public Health*. 2019;19(1):536. (shared first authorship)
- 16 **Müller M**, Eastline J, Nagler M, Exadaktylos AK, Sauter TC. Application of prothrombin complex concentrate for reversal of direct oral anticoagulants in clinical practice: indications, patient characteristics and clinical outcomes compared to reversal of vitamin K antagonists. *Scand J Trauma Resusc Emerg Med*. 2019;27(1):48.

- 17 Schuh SK, Seidenberg R, Arampatzis S, Leichtle AB, Hautz WE, Exadaktylos AK, Schechter CB, **Müller M**. Diagnosis of Urinary Tract Infections by Urine Flow Cytometry: Adjusted Cut-Off Values in Different Clinical Presentations. *Dis Markers*. 2019;2019:10.
- 18 **Müller M**, Dahdal S, Saffarini M, Uehlinger D, Arampatzis S. Evaluation of Nutrition Risk Screening Score 2002 (NRS) assessment in hospitalized chronic kidney disease patient. *PLoS ONE*. 2019;14(1):e0211200.
- 19 Klenk L, von Rütte C, Henssler JF, Sauter TC, Hautz WE, Exadaktylos AK, **Müller M**. Resource consumption of multi-substance users in the emergency room: A neglected patient group. *PLoS ONE*. 2019;14(9):e0223118.
- 20 **Müller M**, Bosshard F, Nagler M, Roth B, Exadaktylos AK, Sauter TC. Shorter Hospital Stay and Fewer Hospitalizations in Patients With Visible Hematuria on Direct Oral Anticoagulants Compared to on Vitamin K Antagonists. *Urology*. 2019;132:101-108.
- 21 Hautz WE, Sauter TC, Exadaktylos AK, Krummrey G, Schaubert S, **Müller M**. Barriers to seeking emergency care during the COVID-19 pandemic may lead to higher morbidity and mortality – a retrospective study from a Swiss university hospital. *Swiss Med Wkly*. 2020;150:w20331.
- 22 **Müller M**, Goeldlin MB, Gaschen J, Sauter TC, Stock S, Wagner F, Exadaktylos AK, Fischer U, Kalla R, Mantokoudis G. Characteristics and resource needs in patients with vestibular symptoms: a comparison of patients with symptoms of unknown versus determined origin. *BMC Emerg Med*. 2020;20(1):70.
- 23 **Müller M**, Münster JM, Hautz WE, Gerber JL, Schefold JC, Exadaktylos AK, Pfortmueller CA. Increased S-100 B levels are associated with fractures and soft tissue injury in multiple trauma patients. *Injury*. 2020;51(4):812-818.
- 24 Sauter TC, Rönz K, Hirschi T, Lehmann B, Hütt C, Exadaktylos AK, **Müller M**. Intubation in acute alcohol intoxications at the emergency department. *Scand J Trauma Resusc Emerg Med*. 2020;28(1):11.
- 25 Abdurashidova T, Monney P, Tzimas G, Soborun N, Regamey J, Daux A, Barras N, Kirsch M, **Müller M**, Hullin R. Non-severe aortic regurgitation increases short-term mortality in acute heart failure with preserved ejection fraction. *Eur J Heart Fail*. 2020;7(6):3901–3909. (shared last authorship)
- 26 Rönz K, Hirschi T, Becker S, Krummrey G, Exadaktylos AK, Sauter TC, Hautz WE, **Müller M**. Predictors of High Resource Consumption in Alcohol Intoxicated Patients in the Emergency Department. *Int J Environ Res Public Health*. 2020;17(11):4122.
- 27 Gaertner K, Wildbolz S, Speidel V, Exadaktylos AK, Hautz WE, **Müller M**. Prevalence and practice of opioid prescription at a Swiss emergency department: 2013-2017. *Swiss Med Wkly*. 2020;150:w20202.
- 28 Hautz WE, Sauter TC, Hautz SC, Kämmer JE, Schaubert SK, Birrenbach T, Exadaktylos AK, Stock S, **Müller M**. What determines diagnostic resource consumption in emergency medicine: patients, physicians or context?. *Emerg Med J*. 2020;37(9):546-551.
- 29 Birrenbach T, Geissbühler A, Exadaktylos AK, Hautz WE, Sauter TC, **Müller M**. A dangerously underrated entity? Non-specific complaints at emergency department presentation are associated with utilisation of less diagnostic resources. *BMC Emergency Medicine*. 2021;21(1):133.
- 30 Blunier S, Utiger S, Klukowska-Rötzler J, Exadaktylos A, Brodmann Maeder M, **Müller M**. Lessons Learned – Beobachtungsstudie nach einem Jahr Sprechstunde «Häusliche Gewalt» am Universitären Notfallzentrum Bern. *Praxis*. 2021;110(14):789-796.
- 31 Anwender H, Klingberg K, Gerber J, Bednarski P, Exadaktylos A, **Müller M**. Major trauma during COVID-19 in a level 1 trauma centre in Switzerland - a cohort study comparing the years 2020 and 2019. *Swiss Med Wkly*. 2021;151:w30010.
- 32 Brockhus LA, Bärtsch M, Exadaktylos AK, Keitel K, Klukowska-Rötzler J, **Müller M**. Clinical Presentations of Adolescents Aged 16–18 Years in the Adult Emergency Department. *Int J Environ Res Public Health*. 2021;18(18):9578. (shared last authorship)
- 33 **Müller M**, Chanas I, Nagler M, Exadaktylos AK, Sauter TC. Falls in ED patients: do elderly patients on direct oral anticoagulants bleed less than those on vitamin K antagonists?. *Scand J Trauma Resusc Emerg Med*. 2021;29(1):56.
- 34 **Müller M**, Traschitzger M, Nagler M, Arampatzis S, Exadaktylos AK, Sauter TC. Impaired kidney function at ED admission: a comparison of bleeding complications of patients with different oral anticoagulants. *BMC Emerg Med*. 2021;21(1):105.

- 35 **Müller M**, Schechter CB, Hautz WE, Sauter TC, Exadaktylos AK, Stock S, Birrenbach T. The development and validation of a resource consumption score of an emergency department consultation. *PLoS ONE*. 2021;16(2):e0247244.
- 36 Gerber JL, Suppiger T, Sauter TC, Traschitzger M, **Müller M**, Exadaktylos AK. Tram, rail, bicycle: An unhappy triad? Rising incidence and resource consumption of tramline-associated bicycling accidents in Bern, Switzerland. *Accid Anal Prev*. 2021;151:105914. (shared last authorship)

Co-Author

- 37 Bruggemann GP, Bruggemann L, Heinrich K, **Müller M**, Niehoff A. Biological tissue response to impact like mechanical loading. *Footwear Sci*. 2011;3(1):13-22.
- 38 Caversaccio NI, Reina Caro MD, Prince R, **Müller M**, Lewis CS, Bogdanov VY, Dufour J, Angelillo-Scherrer A. Alternatively spliced tissue factor levels are elevated in the plasma of patients with chronic liver diseases. *Eur J Gastroenterol Hepatol*. 2018;30(12):1470-1475.
- 39 Carreira H, Williams R, **Müller M**, Harewood R, Stanway S, Bhaskaran K. Associations Between Breast Cancer Survivorship and Adverse Mental Health Outcomes: A Systematic Review. *J Natl Cancer Inst*. 2018;110(12):1311-1327.
- 40 Bschor T, Henssler J, **Müller M**, Baethge C. Baclofen for alcohol use disorder-a systematic meta-analysis. *Acta Psychiatr Scand*. 2018;138(3):232-242.
- 41 Keidar O, Jegerlehner SN, Ziegenhorn S, Brown AD, **Müller M**, Exadaktylos AK, Srivastava DS. Emergency Department Discharge Outcome and Psychiatric Consultation in North African Patients. *Int J Environ Res Public Health*. 2018;15(9):2033.
- 42 Klukowska-Röetzel J, Eracleous M, **Müller M**, Srivastava DS, Krummrey G, Keidar O, Exadaktylos AK. Increased Urgent Care Center Visits by Southeast European Migrants: A Retrospective, Controlled Trial from Switzerland. *Int J Environ Res Public Health*. 2018;15(9):1857.
- 43 Walder A, **Müller M**, Dahdal S, Sidler D, Devetzi V, Leichtle AB, Fiedler MG, Popp AW, Lippuner K, Vogt B, Uehlinger D, Huynh-Do U, Arampatzis S. The effect of a previously created distal arteriovenous-fistula on radial bone DXA measurements in prevalent renal transplant recipients. *PLoS ONE*. 2018;13(7):e0200708.
- 44 Hautz WE, Kämmer JE, Hautz SC, Sauter TC, Zwaan L, Exadaktylos AK, Birrenbach T, Maier V, **Müller M**, Schaubert SK. Diagnostic error increases mortality and length of hospital stay in patients presenting through the emergency room. *Scand J Trauma Resusc Emerg Med*. 2019;27(1):54.
- 45 Pfortmueller CA, Faeh L, **Müller M**, Eberle B, Jenni H, Zante B, Prazak J, Englberger L, Takala J, Jakob SM. Fluid management in patients undergoing cardiac surgery: effects of an acetate- versus lactate-buffered balanced infusion solution on hemodynamic stability (HEMACETAT). *Crit Care*. 2019;23(1):159.
- 46 Chalikias G, Serif L, Kikas P, Thomaidis A, Stakos D, Makrygiannis D, Chatzikiyiakou S, Papoulidis N, Voudris V, Lantzouraki A, **Müller M**, Arampatzis S, Konstantinides S, Tziakas D. Long-term impact of acute kidney injury on prognosis in patients with acute myocardial infarction. *Int J Cardiol*. 2019;283:48-54.
- 47 Brandt L, Henssler J, **Müller M**, Wall S, Gabel D, Heinz A. Risk of Psychosis Among Refugees: A Systematic Review and Meta-analysis. *JAMA Psychiatry*. 2019;76(11):1133-1140.
- 48 Brandt L, Bschor T, Henssler J, **Müller M**, Hasan A, Heinz A, Gutwinski S. Antipsychotic Withdrawal Symptoms: A Systematic Review and Meta-Analysis. *Front Psychiatry*. 2020;11:569912.
- 49 Klingberg K, Stoller A, **Müller M**, Jegerlehner S, Brown AD, Exadaktylos A, Jachmann A, Srivastava D. Asylum Seekers and Swiss Nationals with Low-Acuity Complaints: Disparities in the Perceived level of Urgency, Health Literacy and Ability to Communicate - A Cross-Sectional Survey at a Tertiary Emergency Department. *Int J Environ Res Public Health*. 2020;17(8):2769.
- 50 Henssler J, **Müller M**, Carreira H, Bschor T, Heinz A, Baethge C. Controlled drinking – non-abstinent versus abstinent treatment goals in alcohol use disorder: A Systematic Review, Meta-Analysis and Meta-Regression. *Addiction*. 2020;116(8):1973-1987.
- 51 Messmer AS, Zingg C, **Müller M**, Gerber JL, Schefold JC, Pfortmueller CA. Fluid Overload and Mortality in Adult Critical Care Patients-A Systematic Review and Meta-Analysis of Observational Studies. *Crit Care Med*. 2020;48(12):1862-1870.

- 52 Henssler J, Brandt L, **Müller M**, Liu S, Montag C, Sterzer P, Heinz A. Migration and schizophrenia: meta-analysis and explanatory framework. *Eur Arch Psychiatry Clin Neurosci*. 2020;270(3):325-335.
- 53 Schefold JC, Gerber JL, Angehrn MC, **Müller M**, Messmer AS, Leichtle AB, Fiedler GM, Exadaktylos AK, Pfortmueller CA. Renal Function-Adjusted D-Dimer Levels in Critically Ill Patients With Suspected Thromboembolism. *Crit Care Med*. 2020;48(4):e270-e276.
- 54 Birrenbach T, Zbinden J, Papagiannakis G, Exadaktylos AK, **Müller M**, Hautz WE, Sauter TC. Effectiveness and Utility of Virtual Reality Simulation as an Educational Tool for Safe Performance of COVID-19 Diagnostics: Prospective, Randomized Pilot Trial. *JMIR Serious Games*. 2021;9(4):e29586.
- 55 Boldt J, Steinfort F, **Müller M**, Exadaktylos AK, Klukowska-Roetzler J. Online Newspaper Reports on Ambulance Accidents in Austria, Germany, and Switzerland: Retrospective Cross-sectional Review. *JMIR Public Health Surveill*. 2021;7(11):e25897.
- 56 Michel J, Stuber R, **Müller M**, Mettler A, Furrer H, Ferrand RA, Exadaktylos AK, Hautz WE, Sauter TC. COVID-19 and HIV testing: different viruses but similar prejudices and psychosocial impacts. *JoGHR*. 2021;5:e2021022.
- 57 Radtke S, Trepp G, **Müller M**, Exadaktylos AK, Klukowska-Rötzler J. Floorball Injuries Presenting to a Swiss Adult Emergency Department: A Retrospective Study (2013–2019). *Int J Environ Res Public Health*. 2021;18(12):6208.
- 58 Esteves Pereira M, Bocksruker C, Kremer Hovinga JA, **Müller M**, Daskalakis M, Mansouri Taleghani B, Nagler M. Immunoabsorption for the Treatment of Acquired Hemophilia: New Observational Data, Systematic Review, and Meta-Analysis. *Transfus Med Rev*. 2021;35(2):125–134.
- 59 Tshering Vogel DW, Kiss B, Heverhagen JT, Benackova K, Burkhard F, **Müller M**, Uehlinger D, Arampatzis S. Prospective Comparison of Contrast-Enhanced Ultrasound and Magnetic Resonance Imaging to Computer Tomography for the Evaluation of Complex Cystic Renal Lesions. *Urology*. 2021;154:320-325.
- 60 Mettler AC, Piazza L, Michel J, **Müller M**, Exadaktylos AK, Hautz WE, Sauter TC. Use of telehealth and outcomes before a visit to the emergency department: a cross-sectional study on walk-in patients in Switzerland. *Swiss Med Wkly*. 2021;151:w20543.

Reviews, case series, etc.

First/Senior author

- 61 **Müller M**, Khamis D, Srivastava D, Exadaktylos AK, Pfortmueller CA. Understanding Refugees' Health. *Semin Neurol*. 2018;38(2):152-162.
- 62 Exadaktylos AK, **Müller M**. Let's talk about violence - more!. *Swiss Med Wkly*. 2020;150:w20172.

Co-Author

- 63 Savage T, Niehoff A, Bruggemann L, **Müller M**, Zaucke F, Eckstein F, Muller-Lung U, Bruggemann GP. The use of biomarkers to assess the response of cartilage to exercise. *Br J Sports Med*. 2011;45(4):326-326.
- 64 Carreira H, Williams R, **Müller M**, Harewood R, Bhaskaran K. Adverse mental health outcomes in breast cancer survivors compared to women who did not have cancer: systematic review protocol. *Syst Rev*. 2017;6(1):162.
- 65 Carreira H, Williams R, **Müller M**, Harewood R, Stanway S, Bhaskaran K. Response to Hulliard, Le Strat, Dubertre, et al.. *J Natl Cancer Inst*. 2019;111(3):337.
- 66 Lu H, Lu H, Kosinski C, Wojtuszczyński A, Zanchi A, Carron P, **Müller M**, Meyer P, Martin J, Muller O, Hullin R. SGLT2 Inhibitors, What the Emergency Physician Needs to Know: A Narrative Review. *J Clin Med*. 2021;10(9):2036.