

Prevalence, Severity, and Risk Factors for Prescribing Errors in post - COVID-19 patients

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Challenge



- 5 - 7% of all hospital admissions appear to be medication-related^{1,2}.
 - **66% preventable**



- **\$42 billion** each year.



- **Harms patients** and **pressures care capacity**.



Previous findings of a pharmacotherapy team

• Factors associated with prescribing errors^{1,2} in Amsterdam UMC:



- Prescribing and assessing medication beyond own expertise;
- High workload;
- High turnover of prescribers;
- Hard to find or interpret guidelines & protocols.

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ORIGINAL ARTICLE |  Open Access    

The pharmacotherapy team: A novel strategy to improve appropriate in-hospital prescribing using a participatory intervention action method

Rashudy F. Mahomedradja , Kim C.E. Sigaloff, Jessica K. Bekema, Marieke J.H.J. Dekker, David J. Brinkman, Marianne A. Kuijvenhoven, Marlou L.H. van Beneden ... [See all authors](#) 

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"VU LibSearch"

The authors confirm that the Principal Investigator for this paper is Michiel van Agtmael and that he has direct clinical responsibility for patients.



Aim

To determine the **prevalence, severity, and risk factors for PEs in COVID-19 patients**, hospitalized during the 1st wave of SARS-CoV-2 in an academic hospital in the Netherlands, at a post - COVID-19 outpatient clinic (**PCOC**) **3 months after hospital discharge**.





Methods

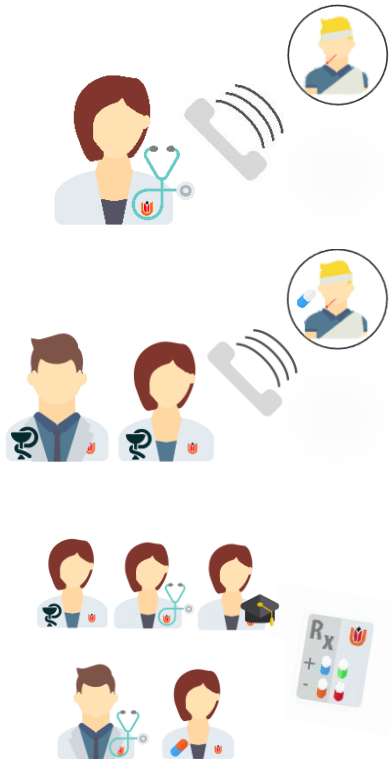


1. Patient invited by pulmonologist for PCOC appointment:

- 6 weeks after COVID-19 - related hospital discharge from Amsterdam UMC.



Methods



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- 6 weeks after COVID-19 - related hospital discharge from Amsterdam UMC.

2. Medication interview by a member of the pharmacotherapy team:

- 2 weeks prior to patient's PCOC appointment.
- E.g. current medication use, incl. OTC-medication; ADEs¹; medication-related problems.

3. Multidisciplinary meetings:

- 1 weeks prior to patient's PCOC visit.
- Consensus on medication use before hospitalization (CMA), at discharge (CMD) and at PCOC (CMP).
- Structured medication review to indentify PEs^{1,2}.
- Medication optimization advices to pulmonologist in ePatient Record.



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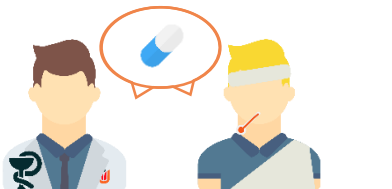
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4. (if necessary) face-to-face consult with patient by pharmacotherapy team member(s) at PCOC:

- Incomplete medication interview, i.e. language barriers;
- On patient's request.



Methods

1. PE categorization:

- Inappropriate medications;
- Unintentional drug discrepancies.

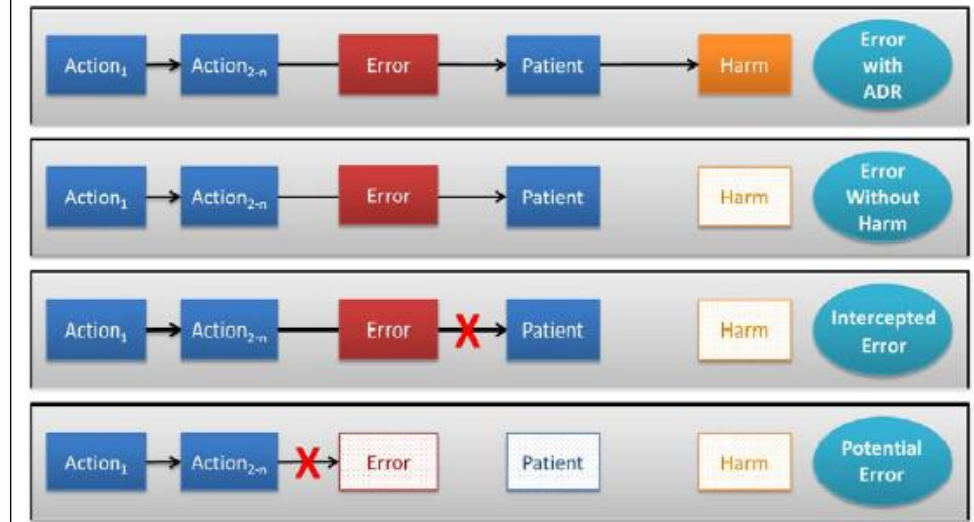


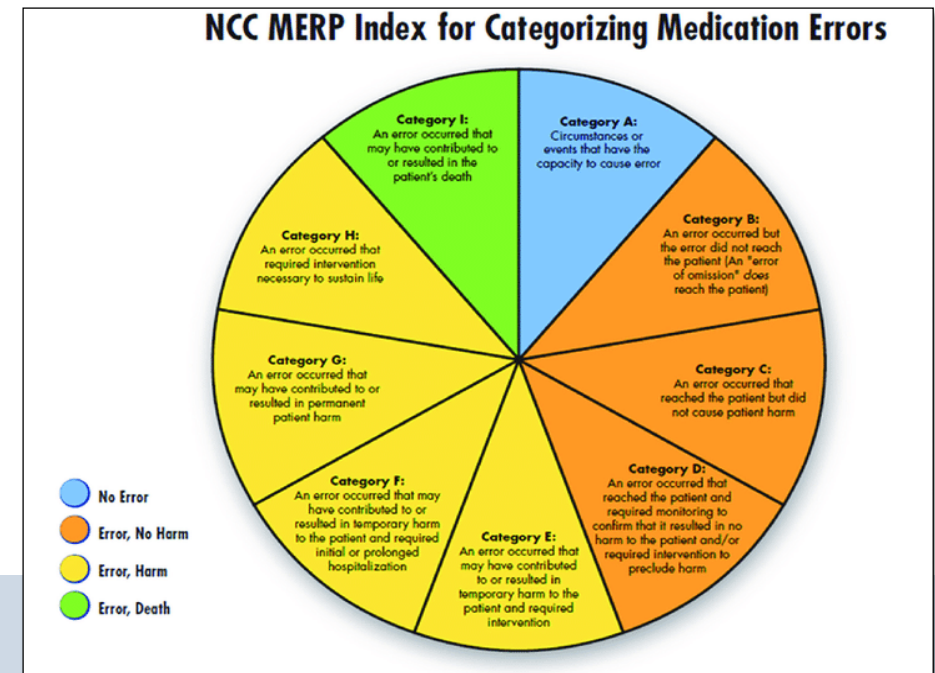
Figure 2: Concept for the classification of medication error reports for pharmacovigilance purposes. Depending on the break in the chain of events (represented by X), medication errors may be classified as error with ADR, error without harm, intercepted error and potential error.

2. Assessment according EMA classification:

- No harm;
- Harm;

3. Level of severity assessment using the NCC MERP Index:




- In case of harm, NCC MERP category E - I.





Results

1 July 2020 - 1 October 2020

-  **102 patients approached** for a structured medication review by a multidisciplinary pharmacotherapy team.
-  **4 patients excluded:**
 - 2 pt not available by telephone AND no show at PCOC appointment.
 - 2 pt physical consult needed, however no show at PCOC appointment.
-  A total of **98 patients included in analysis.**



Results - Patient characteristics

| | Included patients (N = 98) |
|---|----------------------------|
| Age, median (range) | 61 (18 - 86) years |
| Gender, male | 67.3 % |
| Charlson Comorbidity Index, mean (range) | 2 (0 - 6) |
| Transferred from other hospital | 27.6 % |
| Admission duration at Amsterdam UMC - location VUmc, mean (range) | 8.5 (1 - 70) days |
| Number of intramural transfers, mean (range) | 1 (0 - 8) transfer(s) |
| Number of patients receiving medication reconciliation during hospitalization | 7.1 % |
| Number of patients admitted to the ICU during hospitalization | 36.7 % |
| ➤ ICU admission duration, mean (range) | 12 (1 - 61) days |
| Number of prescriptions at hospital admission according to CMA, mean (range) | 3.0 (0 - 16) prescriptions |
| Number of prescriptions at hospital admission according to CMD, mean (range) | 5.0 (0 - 17) prescriptions |
| Number of prescriptions at time of PCOC visit according to CMP, mean (range) | 3.5 (0 - 19) prescriptions |



Results - Prevalance, moment of introduction & severity of PEs

| | Included patients (N =98) |
|--|---------------------------|
| Number of patients with a PE at PCOC visit | 91.8 % (n = 90) |
| Number of PEs: | 139 |
| ➤ Inappropriate medications | 48.2 % (n = 67) |
| ➤ Unintentional drug discrepancies | 57.8 % (n = 72) |
| Moment a PE was introduced: | |
| ➤ Between hospital admission and - discharge (hospitalization) | 45.3 % (n = 63; N= 139) |
| ➤ Between hospital discharge & PCOC | 23.0 % (n = 32; N= 139) |
| ➤ Before COVID-19 - related hospitalization | 31.7 % (n = 44; N= 139) |
| Number of PE resulting in harm according to EMA classification tool | 11.5 % (n = 16; N = 139) |
| ➤ Number of patients affected | 8.2 % (n = 8) |
| ➤ NCC MERP Category E | 100 % (N = 16) |



Severity assessment - example of a PE resulting in harm

Case 1

49 y/o male, medical history of Diabetes Mellitus type 2.

Elevated blood glucose at time of PCOC visit: 20.3.

| Medication at admission | Medication at discharge | Medication at PCOC |
|---------------------------------|--------------------------|-------------------------------|
| 1 Metformin 2 dd 1000 mg | 1 Metformin 1 dd 1000 mg | 1 Metformin 1 dd 1000 mg |
| 2 Gliclazid 1dd 120 mg | 2 Gliclazid 1dd 120 mg | 2 Gliclazid 1dd 120 mg |
| 3 Novomix 30/70 E/ml 20 - 10 IE | 3 - | 3 Novomix 30/70 E/ml 6 - 6 IE |

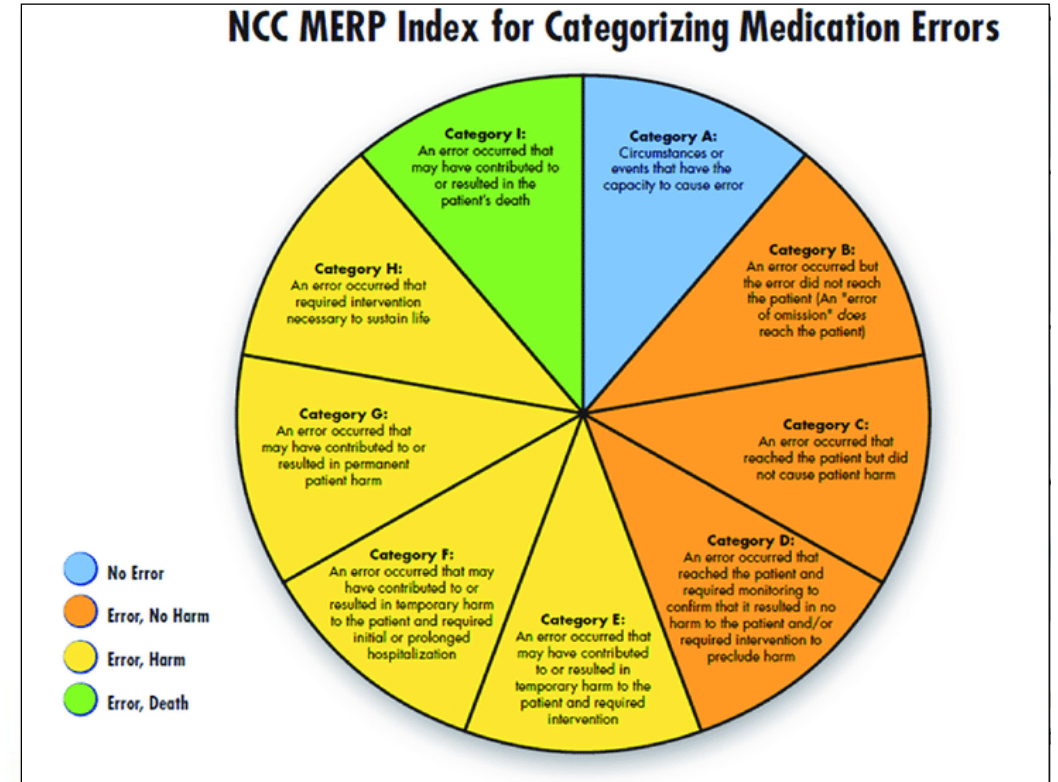


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Example of a PE not resulting in

Case 2

67 y/o female, with a medical history of Diabetes Mellitus
Admitted due to COVID-19 - pneumonia, complicated by

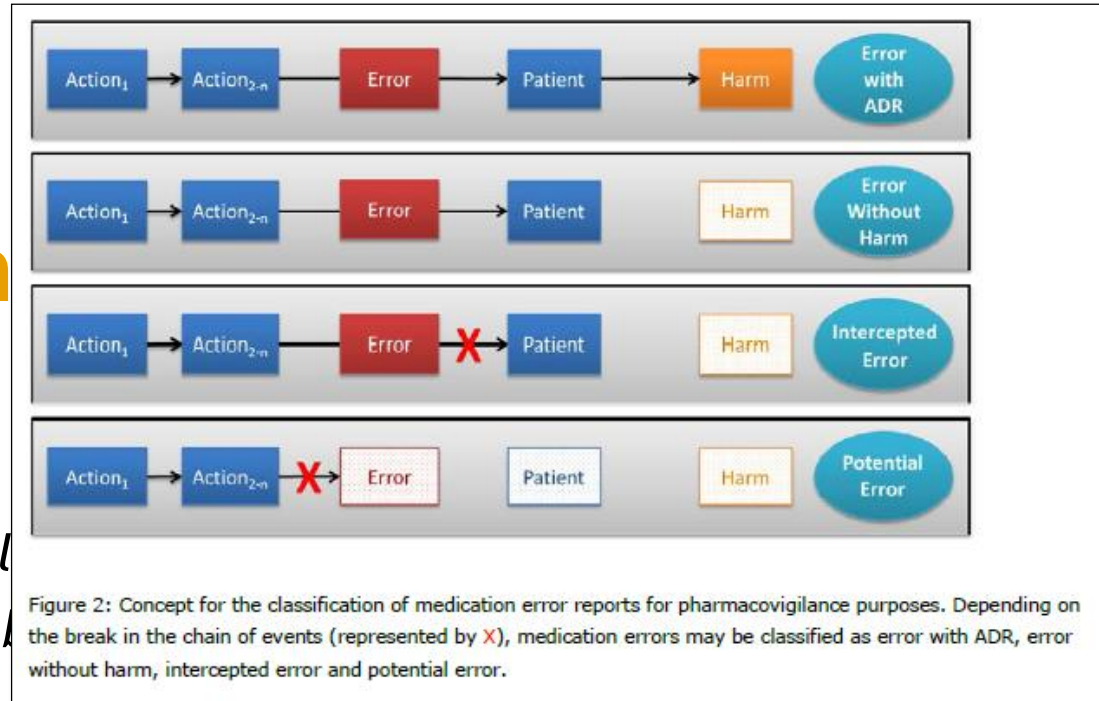
- ICU-admission
- and development of atrial fibrillation de novo.

- During hospitalization:
- At discharge:
- At PCOC visit:

Indication for rivaroxaban and prescribed as 1 dd 20 mg.

Rivaroxaban 1 dd 20 mg discontinued.

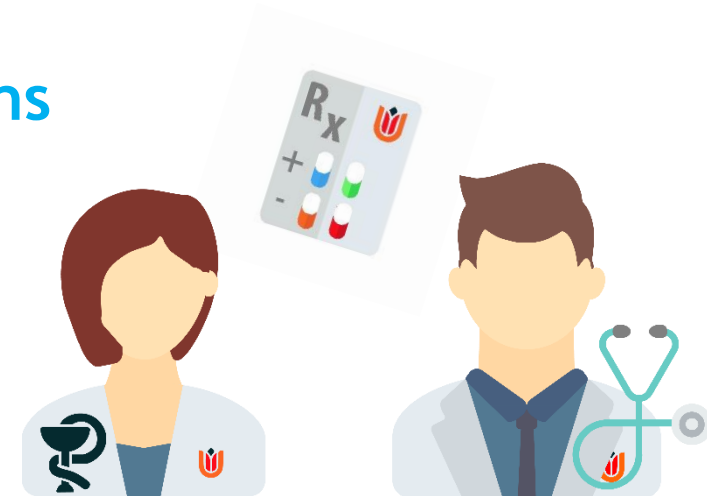
No rivaroxaban in use; CHADVASC-score = 4; no signs of embolism or complications.





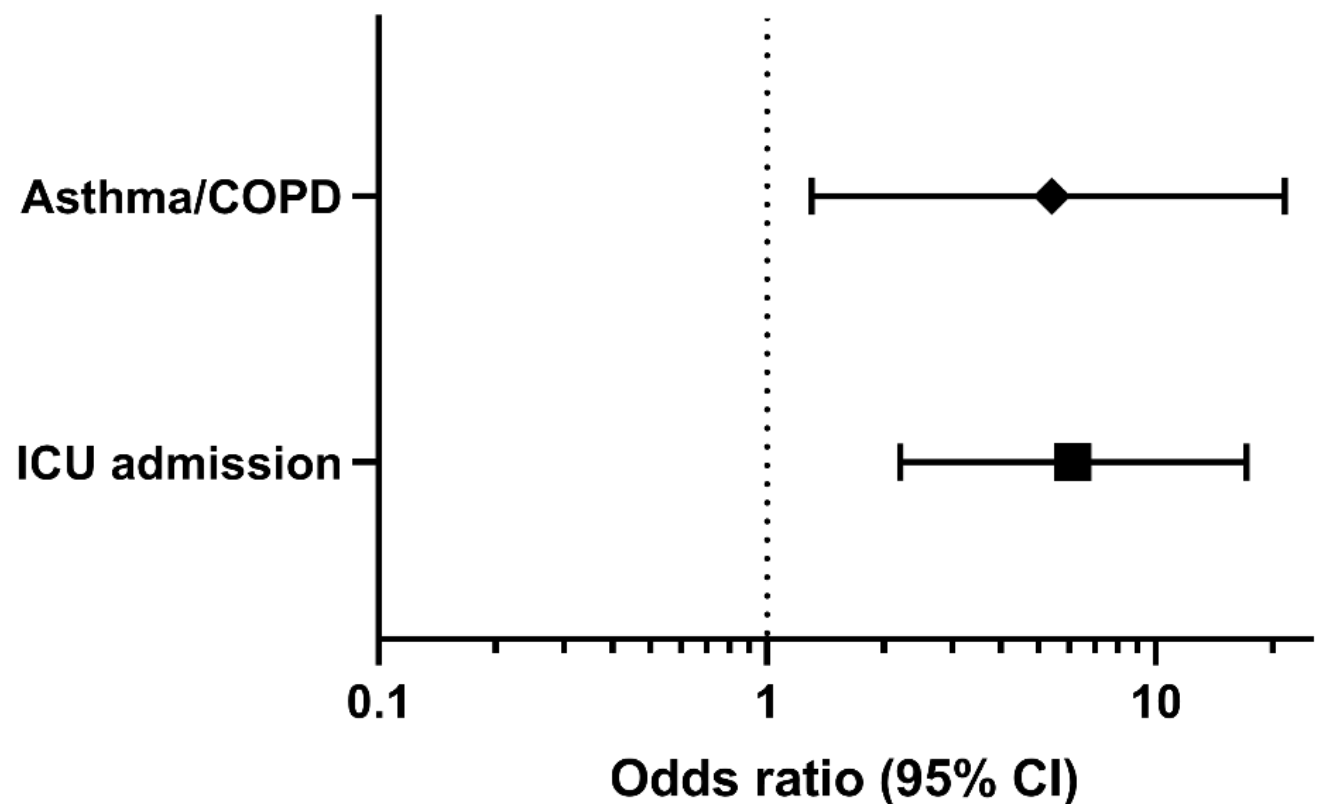
A structured medication review for everybody!?

- Ideally, **every** hospital admitted patient.
- However, requires **time and skills**.
- Especially in times of a pandemic, **targeted interventions** are in place.



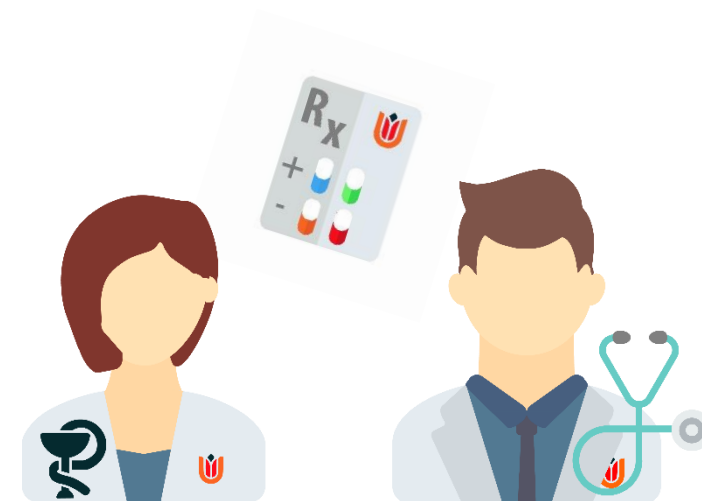


A structured medication review for everybody!?



ICU admission ($p < 0.001$) - **OR 6.08**, 95% CI, 2.16 - 17.09

Medical history of COPD / asthma ($p = 0.02$) - **OR 5.36**, 95% CI, 1.34-21.5





Findings in perspective



Findings from only one center...

- Does this apply to other hospitals in the Netherlands or other countries in the world?
- Are these findings comparable with the non-pandemic situation?



Findings from the non-pandemic situation:

- O'Riordan et al.¹:
43% (n = 83) patients had a PE after hospital discharge
- Prevalance is twice as high in current study!



Lessons learned



≥90% of all patients at PCOC had **≥1 PE**:

- New and unknown challenge → medication safety remains important, even in a pandemic.



PCOC is suitable for **both follow up** as for **pharmacotherapeutic analyses**.



A **multidisciplinary team** enabled a **weighed interpretations of findings**.



Awareness for **ICU-admitted and COPD / Asthma patients** during COVID-19 hospitalization.



Thank you!



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Maaïke van den Bos



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