



Sint Maartenskliniek

Online medication reconciliation

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L2.2

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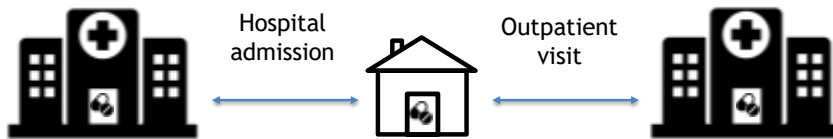
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Posture & movement

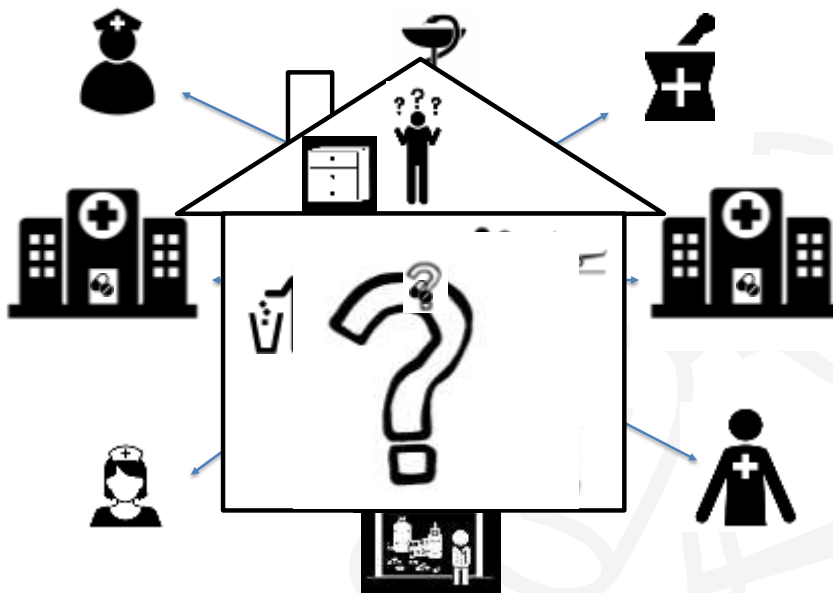
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Background



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But it is never that easy...



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Background

- Transitions in healthcare and drug taking behaviour →
(unintended) medication discrepancies
 - Outpatient settings (50%)¹
 - Inpatient settings (67%)²
 - 1/3 potentially causing harm

Recommended solution: medication reconciliation

¹ Bergeijk 2008, Sint Maartenskliniek

² [1] Tam et al. *CMAJ* 2005;173:510-6. [2] De Winter S, et al. *Qual Saf Health Care* 2010;19:371-5. [3] Pippins JR et al. *J Gen Intern Med* 2008;23:1414-22. [4] Kwan JL et al. *Ann Intern Med* 2013;158:397-403.

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Definition

‘Medication reconciliation is the process of creating the most accurate list of medications at all transition points, with the goal of providing correct medications’

Joint Commission on The Accreditation Of Healthcare Organizations. *Medication Reconciliation Handbook*. ASHP; 2006

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Why online? (1)

- 30 million outpatient visits in NL every year
- Time spent on a live medication reconciliation conversation ≈ 10 minutes

Sint Maartenskliniek:

- Low coverage live medication reconciliation: only 20% of the patients
- Preferably not by a doctor during the consultation/visit

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Why online? (2)

Online medication reconciliation

- Meets national standards
 - physician has a Current Medication List at hospital admission and during (outpatient) visits¹
- Encouraged by patient panels²
 - eHealth useful for information about medication and practical/emotional support with medication use
 - In addition to regular care: contact with healthcare practitioner in person
- Increases patient empowerment

¹Standard handover medication data in the chain, version 1.0 (april 25th 2008)

²Mathijssen et al. 2017

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Medication reconciliation prior to outpatient visit



Sint Maartenskliniek:

- Patient checks in online:
 - Medication reconciliation takes less time at the day of the visit
- Patiënt doesn't check in online:
 - Medication reconciliation takes more time at the day of the consult or the patient is called



Medication reconciliation process at SMK



In case of an online check-in:

2 weeks before the visit	Patient is invited to <ul style="list-style-type: none"> - perform online medication reconciliation - answers questions about experience with medication use
2 days before the visit	Pharmacy technician <ul style="list-style-type: none"> - validates medication list - notes points of interest for visit with physician
During the visit	Physician <ul style="list-style-type: none"> - discusses points of interest - updates medication list - prescribes/changes existing medication
At the day of the visit	Pharmacy technician <ul style="list-style-type: none"> - processes changes made by physicians during visit
At the day of the visit	Patient <ul style="list-style-type: none"> - sees changes made by the physician in online personal health record

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Demo Zorgdoc - PATIENT

Verification

Please check your list of medication to see whether it is complete and whether everything is correct. When you are done, press the button **Next step** at the bottom of the page.

I'm using these 5 medications

<p>Arava 30mg tablet orshuld Leflunomide tablet 30mg 1 tablet once a day</p> <p style="text-align: center;">Modify Confirm</p>	<p>Methotrexate 10mg tablet 500 tb Methotrexate tablet 500mg 1 tablet three times a day</p> <p style="text-align: center;">Modify Confirm</p>	<p>Nagwaan euro 500mg tablet Nagwaan tablet 500mg 1 tablet twice a day</p> <p style="text-align: center;">Modify Confirm</p>	<p>Paracetamol low 1000mg tb Paracetamol tablet 1000mg 1 tablet four times a day</p> <p style="text-align: center;">Modify Confirm</p>
---	--	---	---

Sildenafil citr 40mg 1 tb
Sildenafil tablet 40mg
1 tablet once a day

Modify Confirm

Add a medication

Skip

Next step

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Paracetamol low 1000mg tb

1 of **2**

Modify medication

What do you want to change regarding this medicine?

- I use it differently than I talked four times a day
- I have stopped using the medication
- I have never used this medication
- I use a different brand

Next step

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Demo Zorgdoc - PATIENT



Paracetamol 1000 1000mg 40z

Describe the side usage here

When do you use the medication and how much? (be explicit)

2 tablets once a day

1 tablet twice a day

I use it when necessary

Next step

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Naproxen 500mg 500mg tablet

Modify medication

What do you want to change regarding this medication?

I use it differently than I didn't have a day

I have stopped using the medication

I have never used this medication

I use a different brand

Next step

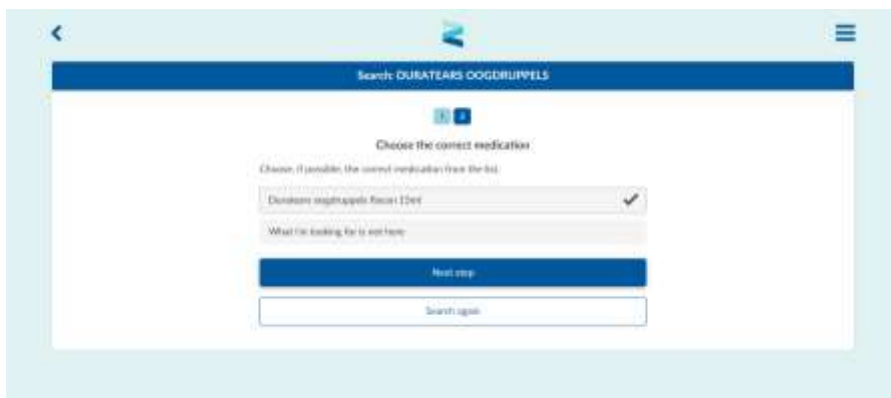
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Demo Zorgdoc - PATIENT



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Demo Zorgdoc - PATIENT



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DURATEARS OOGDEKUPPELS FLACON 15ML

When do you use it and how much?

When do you use the medication and how much? For example:
2 tablets once a day

Take a day in the left eye

Twice when necessary

Next step

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Demo Zorgdoc - PATIENT



Verification

Please check your list of medication to see whether it is complete and whether everything it contains is correct. When you are done, press the button **Next step** at the bottom of the page.

Fix using these 5 medications

<p>Aciva 20mg tablet per half Lofaxapride tablet 20mg</p> <p>1 tablet once a day</p> <p>Modify Confirm</p>	<p>Duratears oogdr: fl 15ml ✓ Duratears 70 fluoresceïne oogdr 3/34mg/ml 15ml</p> <p>Twice a day in the left eye</p> <p>Modify Confirm</p>	<p>Morfamine hcl stylen 500 mg Mefenamic acid tablet 500mg</p> <p>1 tablet three times a day</p> <p>Modify Confirm</p>	<p>Paracetamol twee 1000mg tb Paracetamol tablet 1000mg</p> <p>when necessary 1 tablet twice a day</p> <p>Modify Confirm</p>
<p>Sirovastatin 40mg t fo Simvastatin tablet 40mg</p> <p>1 tablet once a day</p> <p>Modify Confirm</p>			

Add medication | Next | Next step

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Verification

You have verified that all the something in the page is correct. Click on the 'Confirm' button to indicate that the information is the best right.

Please check your list of medications to see whether it is complete and whether everything is complete is correct. When you are done, press the button Next step at the bottom of the page.

I'm using these 4 medications

Aciva 20mg tablet perikald Ibufuprofen tablet 20mg 1 tablet once a day Verify Confirm	Exoratan oogdr 0.15ml Dexamethason ophthelmalie oogdr 0.15mg/ml 0.15ml Twice a day in the left eye Verify Confirm	Morfamine hcl analgin 500-10 Morfine tablet 500mg 1 tablet three times a day Verify Confirm	Piracetam 1000 1000mg-10 Piracetam tablet 1000mg when necessary 1 tablet twice a day Verify Confirm
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Sildenafil tablet 40mg 1-10

Add a medication Next Done

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Summary

Please check your list of medication one last time before it is sent to the Sint Maartenskliniek.

If everything that is displayed here is correct, you may press the button Submit at the bottom of the page.

I'm using these medications

Aciva 20mg tablet perikald	Ibufuprofen tablet 20mg	1 tablet once a day
Exoratan oogdr 0.15ml	Dexamethason ophthelmalie oogdr 0.15mg/ml 0.15ml	Twice a day in the left eye
Morfamine hcl analgin 500-10	Morfine tablet 500mg	1 tablet three times a day
Piracetam 1000 1000mg-10	Piracetam tablet 1000mg	when necessary 1 tablet twice a day
Sildenafil tablet 40mg 1-10	Sildenafil tablet 40mg	1 tablet once a day

I want to change something

Submit

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Questions asked by the Sint Maartenskliniek

To ensure that you are well prepared for your outpatient visit to the rheumatologist, we would like to ask you a couple of questions about your experience with the medication prescribed by your rheumatologist, such as the effects and/or side-effects. The rheumatologist will discuss your answers with you during your next visit.

To start the questionnaire, click:

START

In case you want to skip questions, click:

Skip questions

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Questions asked by the Sint Maartenskliniek - step 2

a) Do you notice sufficient effects from the medication prescribed by the rheumatologist?

Yes

No

Next

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Questions asked by the Sint Maartenskliniek - step 2

1 2 3 4

a) Do you notice sufficient effects from the medication prescribed by the rheumatologist?

Yes:

No:

b) Can you indicate which medications work insufficiently?

Procumolnatrium tablet 1000mg:

Acetylsalicylzuur tablet 100mg:

Dexamethasonpreparaat flacon 10ml:

Next

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Questions asked by the Sint Maartenskliniek - step 3

1 2 3 4

a) Do you notice any side-effects from any medication you currently use which are prescribed by your rheumatologist?

Yes:

No:

Next

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Questions asked by the Sint Maartenskliniek - step 3

1 2 3 4

4) Do you notice any side-effects from any medication you currently use which are prescribed by your rheumatologist?

Yes

No

5) Can you indicate in which medication side-effects occur?

Prevalent tablet 333mg

Leflunomide-tablet 20mg

Chondroitin sulphate-tablet 250mg

6) Which side-effects did you notice?

You have 10 characters left

7) Since when have you noticed side-effects?

You have 10 characters left

Next

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Questions asked by the Sint Maartenskliniek - step 4

1 2 3 4

8) Do you worry about your medication?

Yes

No

Next

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Demo Zorgdoc - PATIENT



 A screenshot of a mobile application interface for a patient questionnaire. The title bar reads "Questions asked by the Sint Maartenskliniek - step 5". Below the title bar is a progress indicator with five colored squares (green, yellow, yellow, yellow, blue) and a question mark icon. The main question is "a) Do you have any difficulties taking/applying any medication?". There are two radio button options: "Yes" (which is selected with a checkmark) and "No". Below this is a text input field for question "b) Can you explain which difficulties you have?". The input field contains the text "Over de toediening" and has a character count "You have 24 characters left". At the bottom is a blue "Next" button.

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Demo Zorgdoc - PATIENT



 A screenshot of a mobile application interface for a patient questionnaire. The title bar reads "Questions asked by the Sint Maartenskliniek - step 6". Below the title bar is a progress indicator with six colored squares (green, yellow, yellow, yellow, yellow, blue) and a question mark icon. The main question is "a) Do you have any other questions about your medication?". There is a text input field for the answer, which is currently empty. Below the input field is a character count "You have 100 characters left". At the bottom is a blue "Next" button.

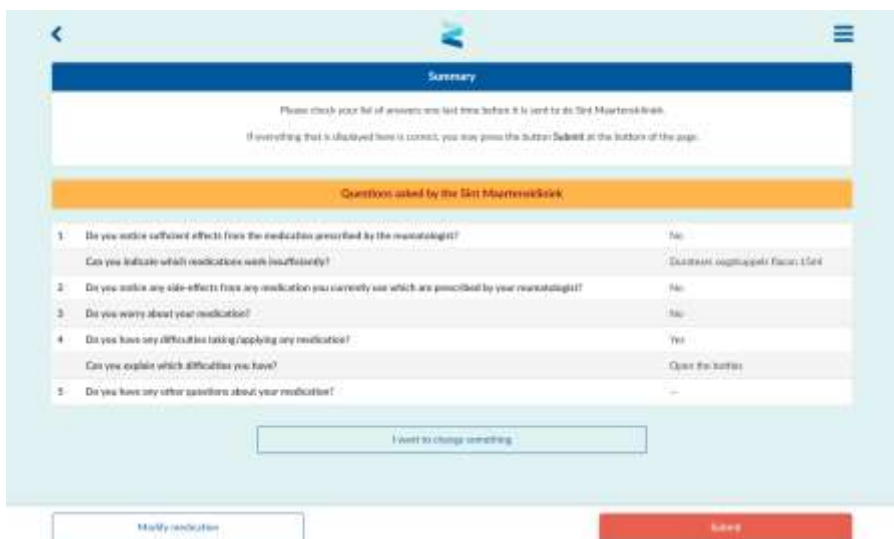
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Demo Zorgdoc - PATIENT



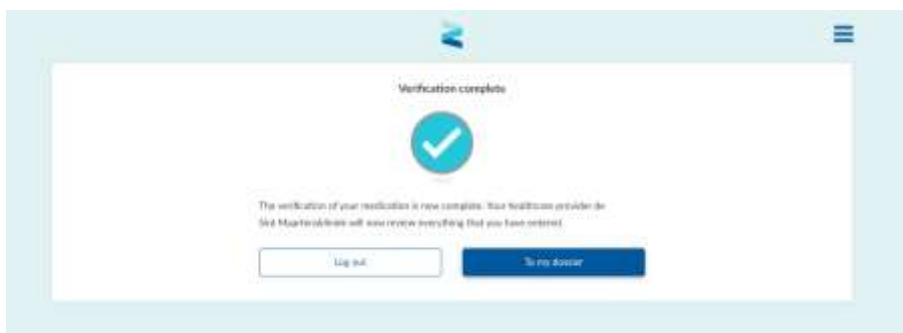
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Demo Zorgdoc - PATIENT



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Demo Zorgdoc - PATIENT



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Medication reconciliation process at SMK



In case of an online check-in:

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At the day of the visit	Pharmacy technician <ul style="list-style-type: none"> - processes changes made by physicians during visit
At the day of the visit	Patient <ul style="list-style-type: none"> - sees changes made by the physician in online personal health record

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Medication reconciliation process at SMK



In case of an online check-in:

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At the day of the visit	Pharmacy technician <ul style="list-style-type: none"> - processes changes made by physicians during visit
At the day of the visit	Patient <ul style="list-style-type: none"> - sees changes made by the physician in online personal health record

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Demo Zorgdoc - PATIENT



The screenshot displays a patient's medication list in the Zorgdoc system. At the top, it states "I'm using these 6 medications". The list includes the following items:

- Acuva 20mg tablet orshuld**: Influenza-ic tablet 20mg, 1 tablet once a day.
- Duroton oogdr 1% 15ml**: Duroton 2% Hydrochloride oogdr 1.5mg/ml 15ml, Twice a day in the left eye.
- Meloxicam tablet 7,5mg**: 1 tablet twice a day.
- Medforonine hcl-mylor 500 tb**: Metformine tablet 500mg, 1 tablet three times a day.
- Paracetamol tva 1000mg tb**: Paracetamol tablet 1000mg, when necessary 1 tablet twice a day.
- Simvastatine wdr 40mg t fo**: Simvastatine tablet 40mg, 1 tablet once a day.

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Considerations



- Is the patient capable of using the online personal health record?
- How does the patient feel about it?
- Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?
- Does online medication reconciliation save time?
- Is the verified medication information used during the visits by the physicians?

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Considerations



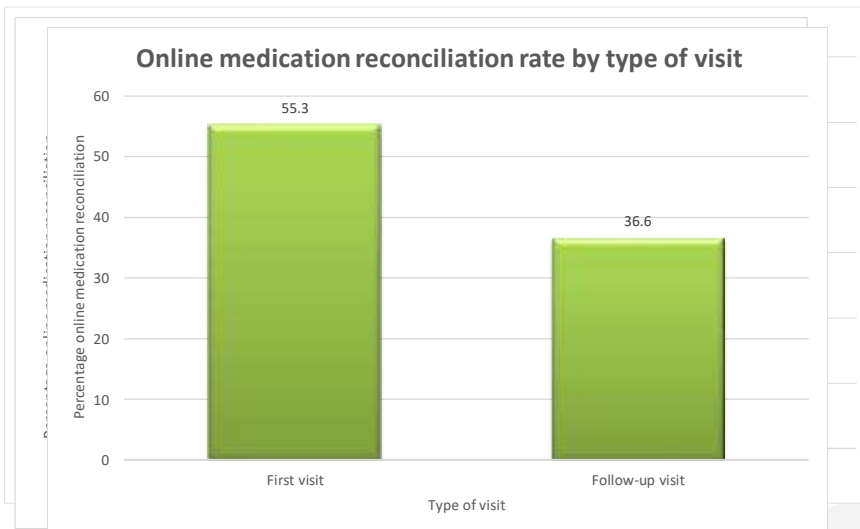
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Is the patient capable of using online personal health record? (1)

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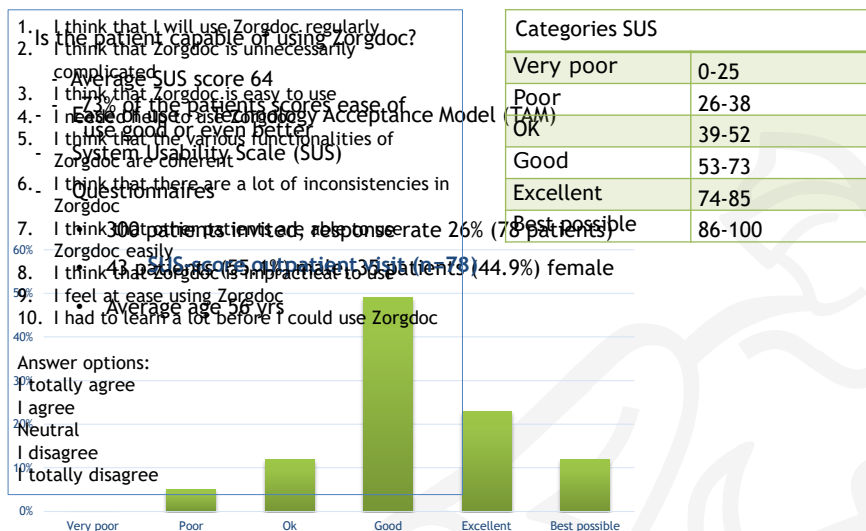


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Is the patient capable of using online personal health record? (2)

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Asaah et al. 2018

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Considerations



- Is the patient capable of using the online personal health record?
- **How does the patient feel about it?**
- Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?
- Does online medication reconciliation save time?
- Is the verified medication information used during the visits by the physicians?

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How does the patient feel about it? (1)



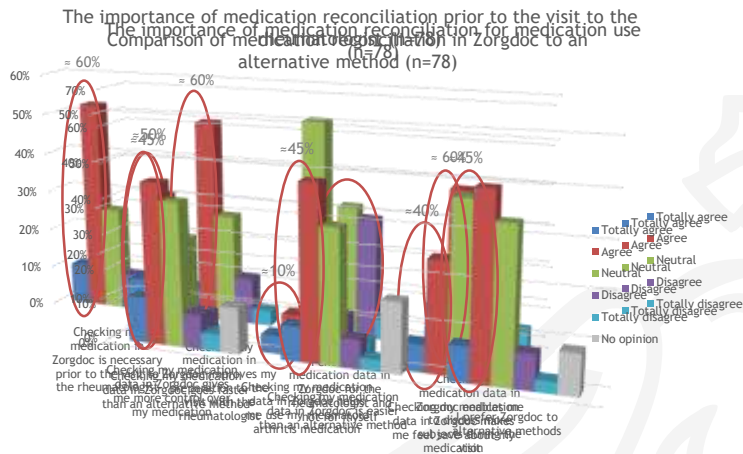
- How does the patient feel about medication reconciliation and the use of Zorgdoc?
 - Perceived usefulness -> TAM
 - Questionnaires
 - 300 patients invited, response rate 26% (78 patients)
 - 43 patients (55.1%) male, 35 patients (44.9%) female
 - Average age 56 yrs

¹Asaah et al. 2018

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How does the patient feel about it? (2)



'Asaah et al. 2018



Considerations

- Is the patient capable of using the online personal health record?
- How does the patient feel about it?
- Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?
- Does online medication reconciliation save time?
- Is the verified medication information used during the visits by the physicians?

Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?



Current research:

- RCT, two arms¹:
 - Online Medication reconciliation before hospital admission
 - Live medication reconciliation before hospital admission
- Primary outcome measure: number of medication discrepancies between the Current Medication List after medication reconciliation and the medication record on the National Exchange Point
- 450 patients included yet
- Interim analysis based on 119 patients:
 - No difference in the number of medication discrepancies between live medication reconciliation and online medication reconciliation

¹ M. Ebben et al., 2019, Leiden University Medical Center

Considerations



- Is the patient capable of using the online personal health record?
- How does the patient feel about it?
- Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?
- **Does online medication reconciliation save time?**
- Is the verified medication information used during the visits by the physicians?



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Does online medication reconciliation save time?

	Online	Live	Telephone
Minutes spent per medication reconciliation	3	10	15
# medication reconciliations per FTE healthcare practitioner per year	38000	11000	7500

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Considerations

- Is the patient capable of using the online personal health record?
- How does the patient feel about it?
- Is the quality of online medication reconciliation comparable to the quality of live medication reconciliation?
- Does online medication reconciliation save time?
- Is the verified medication information used during the visits by the physicians?

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Is the verified medication information used during the visits by the physicians? (1)



Observational pilot study¹:

- Which medication information is used during the visit
- In which sources is this information available?
 - Observation of 84 visits with 9 rheumatologists
 - 130 actions related to medication use
 - Rheumatologist needs information in 51% of the actions and 58% of the visits
 - Availability required information: Current Medication List (CML) 92% of the visits, National Exchange-Point (NEP) 72% of the visits
- A risk-based approach to improve the effectiveness and implementability of medication reconciliation²

¹Geurts et al. 2018. Sint Maartenskliniek, The Netherlands

²Sint Maartenskliniek and Amphia Hospital, Breda, The Netherlands

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Is the verified medication information used during the visits by the physicians? (2)



	Guideline 2008 ¹	Guideline 2019 ²
Medication reconciliation prior to hospital admission	Always	Always
Medication reconciliation during outpatient visit	Always	Medication reconciliation based on risk assessment by the prescriber

¹ Guideline Transfer of Medication data in the chain (2008)

² Guideline Transfer of Medication data in the chain (published in november 2017, not yet a formal guideline)

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Summary



Get MR organized in an efficient way for a large number of patients!

- 1) Critically assess and determine in which situations it is useful to perform medication reconciliation -> risk based approach
- 2) Consider to implement online medication reconciliation
 - Quality of online MR is comparable to live MR in terms of the number of discrepancies
 - Online MR is much more efficient (3 times faster than live, 5 times faster than telephone)
 - Patients are willing and able to perform online medication reconciliation -> patient empowerment



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Thank you for your attention

More information?

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