



WP 4 - Definition of rules for messages and warnings in PHC

DEV 4.1 Report “Description of possibilities to setup rules and controls in PHC IS”

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Podgorica, 11.08.2021





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1. Introduction

Based on analysis of obtained data on prescribing patterns of diclofenac in PHC, rules for prescription process should be set up in PHC IS, which will result in appropriate messages and warnings to appear in PHC IS in health care professional's application. This will result in better management of medicine prescription process in PHC. In order to achieve intended goals, PHC IS needs to be upgraded with rules setting up module and warning and messaging functionalities.

Better integration of CInMED IS with PHC IS will be established in order to allow definition of warning and control of diclofenac prescription by health care professional in the PHC at the daily level.

In PHC IS this will enable showing of messages to healthcare professionals and in CInMED IS this will enable definition of appropriate rules and controls based on conducted analysis in the project.

2. Description of possibilities to setup rules and controls in PHC IS

Rules and controls in PHC IS should be comprehensive in a way that includes all possibilities based on analysis of obtained data on prescribing patterns of diclofenac in PHC.

This means that when doctor prescribes diclofenac, the IS checks the previously available data for a specific patient (diagnosis – working (draft) and final in accordance with International Statistical Classification of Diseases and Related Health Problems – ICD-10 (cg. MKB-10)). IS should check the data in the form *Kontakt* that is used by doctors in daily practice (Fig. 1):





Fig. 1 Marked fields in the form *Kontakt* of PHC IS

These are fields that are filled by selecting one option from the list of values (from MKB-10).

Data (values) of interest related to contraindications for prescribing diclofenac, special warnings and special precautions for use, as well as risk factors are defined in approved *Summary of Product Characteristics* for diclofenac.

For fields that are filled by selecting one option from the list of values, the following values are of interest:

- Contraindications:

MKB-10: I20

Diagnosis (Montenegrin): Stezanje u grudima

Latin: Angina pectoris

MKB-10: I21

Diagnosis (Montenegrin): Akutan infarkt (izumiranje tkiva) srca

Latin: Infarctus myocardii acutus





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MKB-10: I22

Diagnosis (Montenegrin): Ponovljen akutni infarkt srca

Latin: Infarctus myocardii recidivus acutus

MKB-10: I23

Diagnosis (Montenegrin): Akutna komplikacija posle akutnog infarkta srca

Latin: Complicatio acuta post infarctum cordis acutum

MKB-10: I24

Diagnosis (Montenegrin): Druge akutne ishemijske bolesti srca

Latin: Morbi cordis ishaemici acuti alii

MKB-10: I25

Diagnosis (Montenegrin): Hronicna ishemijska bolest srca

Latin: Morbus cordis ischaemicus chronicus

MKB-10: I26

Diagnosis (Montenegrin): Zacepljenje krvnih sudova pluca

Latin: Embolia pulmonis

MKB-10: I27

Diagnosis (Montenegrin): Druge bolesti srca plucnog porekla

Latin: Morbi cordis pulmonales alii

MKB-10: I28

Diagnosis (Montenegrin): Druge bolesti krvnih sudova pluca

Latin: Morbi vasorum pulmonis alii

MKB-10: I42

Diagnosis (Montenegrin): Oboljenja srcanog misica

Latin: Cardiomyopathia

MKB-10: I43

Diagnosis (Montenegrin): Oboljenje misica srca u drugim bolestima

Latin: Cardiomyopathia in morbis aliis

MKB-10: I50

Diagnosis (Montenegrin): Nedovoljna funkcija srca

Latin: Insufficiencia cordis

MKB-10: I60

Diagnosis (Montenegrin): Krvarenje ispod paucinaste mozdanice

Latin: Haemorrhagia subarachnoidalis

MKB-10: I61

Diagnosis (Montenegrin): Krvarenje u mozgu

Latin: Haemorrhagia cerebri

MKB-10: I62

Diagnosis (Montenegrin): Drugo netraumatsko krvarenje u mozgu

Latin: Haemorrhagia intracranialis non traumatica, alia

MKB-10: I63

Diagnosis (Montenegrin): Infarkt mozga-izumiranje tkiva mozga

Latin: Infarctus cerebri



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MKB-10: I64

Diagnosis (Montenegrin): Apopleksija - Mozdana kap, neoznacena kao krvarenja ili infarkt mozga

Latin: Apoplexia cerebri ut haemorrhagia sive infarctus non specificata

MKB-10: I65

Diagnosis (Montenegrin): Zapusenje premozdanih arterija i suzenje premozdanih arterija brz infarkta mozga

Latin: Occlusio arteriae praecerebralis et stenosis arteriae praecerebralis sine infarctus cerebri

MKB-10: I66

Diagnosis (Montenegrin): Zapusenje arterije mozga i suzenje arterije mozga bez infarkta mozga

Latin: Occlusio arteriae cerebri et stenosis arteriae cerebri sine infarctu

MKB-10: I67

Diagnosis (Montenegrin): Druge bolesti krvnih sudova mozga

Latin: Morbi cerebrovasculares alli

MKB-10: I68

Diagnosis (Montenegrin): Bolest krvnih sudova mozga u drugim bolestima

Latin: Morbi cerebrovasculares in morbis aliis

MKB-10: I69

Diagnosis (Montenegrin): Posledice bolesti krvnih sudova mozga

Latin: Sequelae morbi cerebrovascularis

MKB-10: I70

Diagnosis (Montenegrin): Ateroskleroza - zakrecavanje velikih krvnih sudova

Latin: Atherosclerosis

MKB-10: I71

Diagnosis (Montenegrin): Aneurizma - ograniceno prosirenje srcanice i rascep srcanice

Latin: Aneurysma aortae et dissectio aortae

MKB-10: I72

Diagnosis (Montenegrin): Aneurizme drugih krvnih sudova

Latin: Aneurysmata alia

MKB-10: I73

Diagnosis (Montenegrin): Druge bolesti perifernih krvnih sudova

Latin: Morbi vasorum periphericorum alli

MKB-10: I74

Diagnosis (Montenegrin): Zacepljenje arterije i stvaranje krvnog ugruska u arterijama

Latin: Embolia arteriarum et thrombosis arteriarum

MKB-10: I77

Diagnosis (Montenegrin): Druge bolesti arterija i malih arterija

Latin: Morbi arteriales et arteriolares alli

MKB-10: I79

Diagnosis (Montenegrin): Bolesti arterija, malih arterija i kapilara u drugim bolestima

Latin: Morbi arteriales, arteriolares et capillares in morbis aliis



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- Special warnings and special precautions for use:

MKB-10: I10

Diagnosis (Montenegrin): Povišen krvni pritisak, nepoznatog porekla

Latin: Hypertensio arterialis essentialis (primaria)

MKB-10: I11

Diagnosis (Montenegrin): Bolest srca uzrokovana povišenim krvnim pritiskom

Latin: Morbus cordis hypertensivus

MKB-10: I12

Diagnosis (Montenegrin): Povišen krvni pritisak bubreznog porekla

Latin: Morbus renalis hypertensivus

MKB-10: I13

Diagnosis (Montenegrin): Bolest srca i bolest bubrega uzrokovana povišenim krvnim pritiskom

Latin: Morbus cordis et morbus renis hypertensivus

MKB-10: I15

Diagnosis (Montenegrin): Sekundarno povišen krvni pritisak

Latin: Hypertensio arterialis, secundaria

MKB-10: E10

Diagnosis (Montenegrin): Šećerna bolest, insulinozavisan oblik

Latin: Diabetes mellitus ab insulino dependens

MKB-10: E11

Diagnosis (Montenegrin): Šećerna bolest, insulinonezavisan oblik

Latin: Diabetes mellitus ad insulino independens

MKB-10: E12

Diagnosis (Montenegrin): Šećerna bolest kod pothranjenosti

Latin: Diabetes mellitus malnutritionalis

MKB-10: E13

Diagnosis (Montenegrin): Druga oznacena secerna bolest

Latin: Diabetes mellitus alius,specificatus

MKB-10: E14

Diagnosis (Montenegrin): Šećerna bolest, neoznacena

Latin: Diabetes mellitus,non specificatus

MKB-10: E78

Diagnosis (Montenegrin): Poremecaji metabolizma masti i drugi poremecaji masti u krvi

Latin: Disordines metabolismi lipoproteini et lipidaemiae alii

MKB-10: Z72.0 Pušenje



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At the moment when the doctor selects diclofenac through the forms *Recepti* and *Nalozi*, system should, depending on the performed data verification, display an appropriate warning message. Each message would reflect the results of the verification and would be tailored to it.

The trigger for the appearance of the warning message is matching of the data for a specific patient with the given criteria. The scheme is given below (Fig. 2):

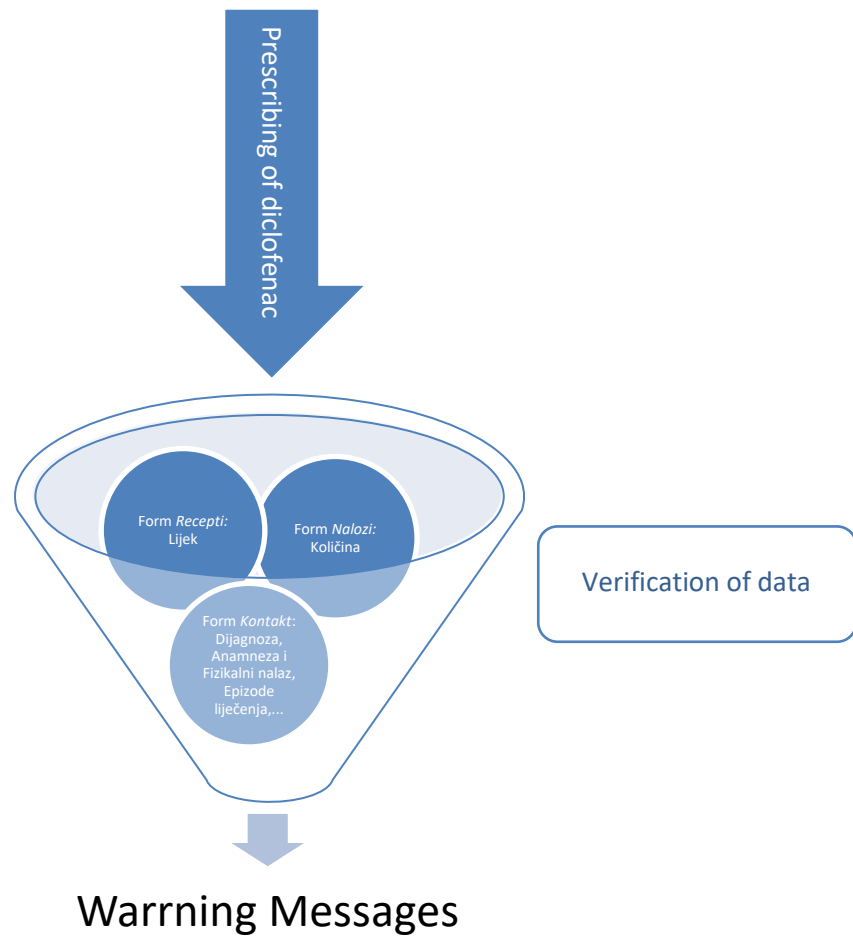


Fig. 2 Scheme of controls and message functionality in PHC IS





If selected diagnosis is on the list of diagnoses that are contraindicated for the use of diclofenac, on the form *Recepti*, after selecting the medicine, by clicking on the mandatory field *Upotreba*, following message will appear (Fig. 3):

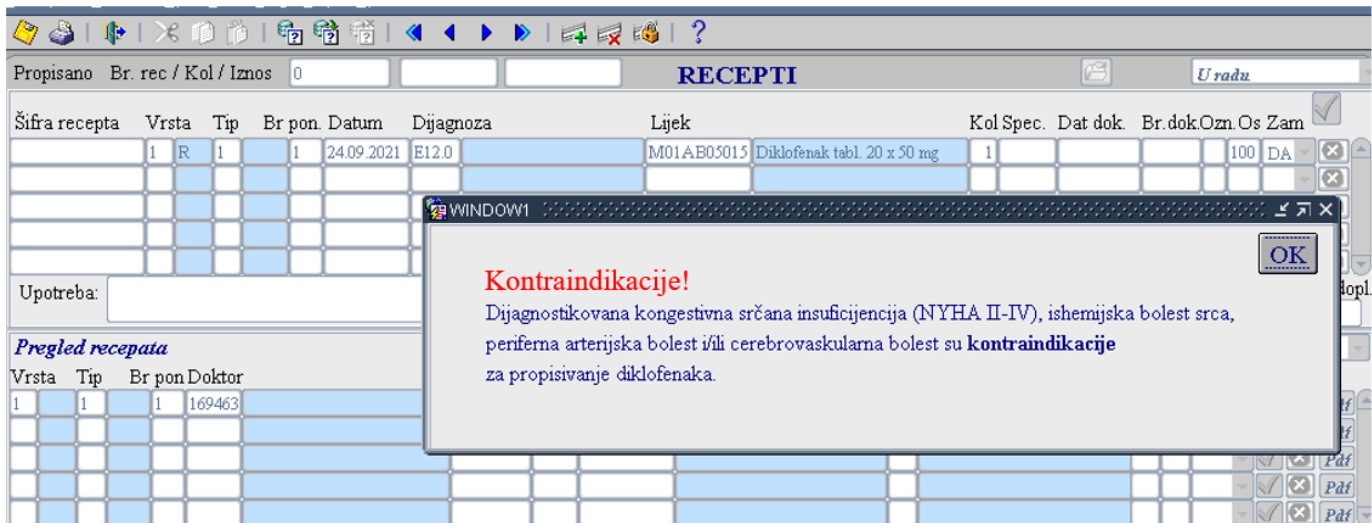


Fig. 3 Warning message 1

Same message will appear for diclofenac ampoules (after selecting medicines and before import of amount).

If selected diagnosis is on the list of diagnoses that are special warnings and special precautions for the use of diclofenac, on the forms *Recepti*, after selecting the medicine, by clicking on the mandatory field *Upotreba*, following message will appear:

For oral forms of diclofenac (Fig. 4):





The screenshot shows a software window titled "RECEPTI" with a table of prescriptions. A modal dialog box titled "WINDOW1" is overlaid on the screen, displaying a warning message in red and black text. The message reads: "Posebna upozorenja i mjere opreza! Pacijenti sa kongestivnom srčanom insuficijencijom (NYHA klasa 1) i pacijenti koji imaju značajne faktore rizika za nastanak kardiovaskularnih događaja (npr. hipertenzija, hiperlipidemija, dijabetes melitus, pušenje) terapiju diklofenakom **treba da započnu tek nakon pažljive procjene.** Preporučena maksimalna dnevna doza je 150 mg. **Kod blažih slučajeva, kao i kod dugotrajne terapije, 75 do 100 mg dnevno je obično dovoljno.** Neželjena dejstva se mogu svesti na najmanju moguću mjeru korišćenjem najniže efektivne doze, u najkraćem vremenskom periodu, neophodnom za kontrolu simptoma." The dialog box has an "OK" button.

Fig. 4 Warning message 2

For rectal forms of diclofenac (Fig. 5):

The screenshot shows the same software window "RECEPTI" but with a different prescription selected: "Diklofen supoz. 10 x 50 mg". The modal dialog box "WINDOW1" displays a similar warning message, but with a different recommendation: "Preporučena maksimalna dnevna doza je 150 mg." The rest of the message text is identical to the one in Fig. 4.

Fig. 5 Warning message 3





For diclofenac ampoules (Fig. 6):

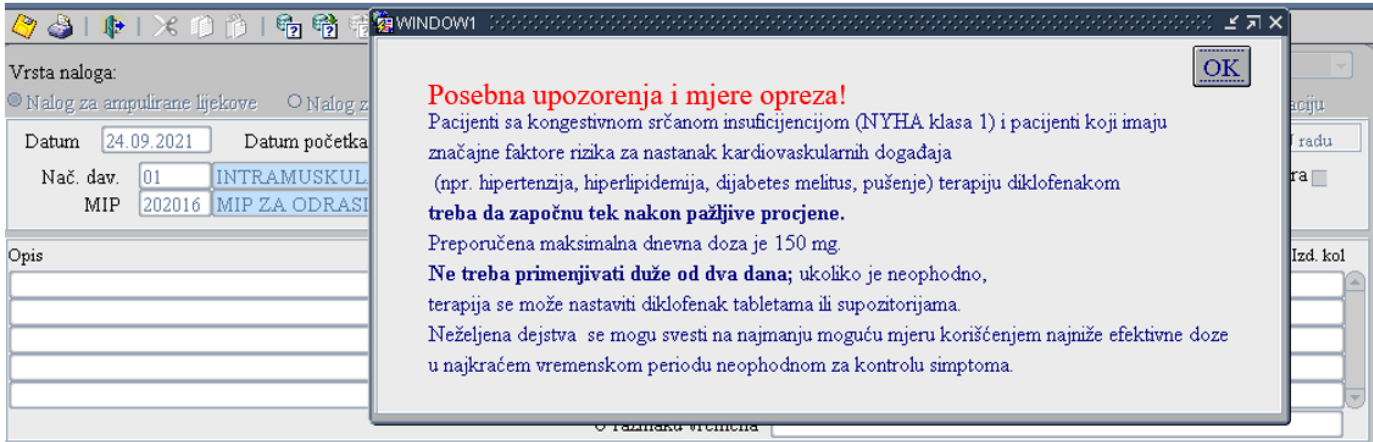


Fig. 6 Warning message 4

If patient has a diagnosis for which diclofenac is contraindicated, as well as a diagnosis for which there is special precautions, a warning message related to the diagnosis for which diclofenac is contraindicated will appear (Fig. 7):

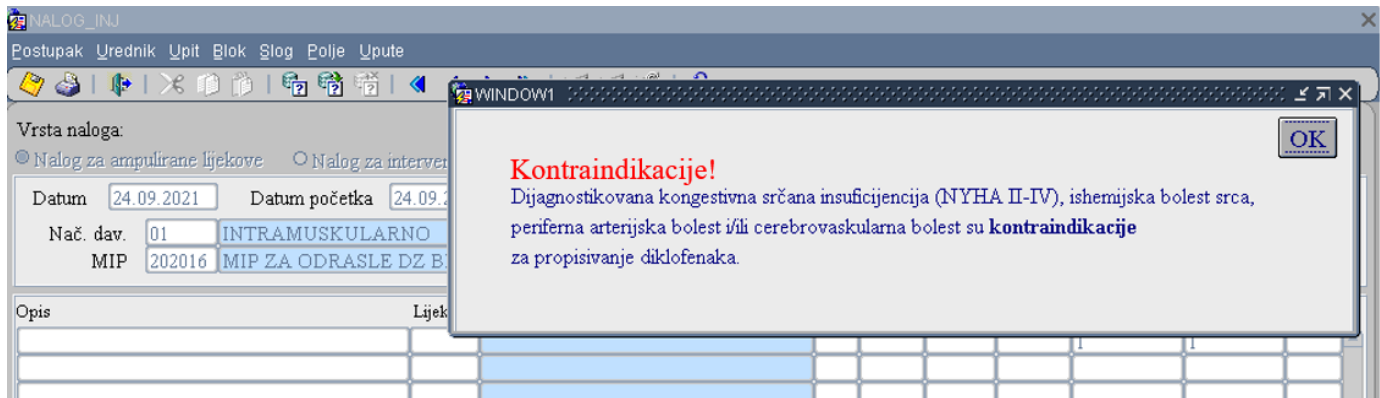


Fig. 7 Warning message 5





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3. Conclusion

New functionalities needs to be well defined and tested in production environment. Also, it sholud be presented to users in PHC IS, in order to achieve best project results and influence prescribing medicine process. Information and warning messages need to be clear and precise in order to avoid confusion.



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