

Technologies Supporting Care for Diabetes in Primary Care in the Czech Republic

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Abstract

Introduction: Since January 1st, 2010 the care for uncomplicated diabetic patients has moved from the diabetes specialists in the Czech Republic and it can be provided by the general practitioners henceforth. We refer about the technologies supporting this new system of care.

Aim and methods: This paper reports on the information systems used to support the diabetes care in GP office and on the technologies connected to this system.

Results: There have been two types of information systems in use: PC DOKTOR, and MEDICUS. Two Internet standards: "Diabetes", and "Prediabetes", have been published and regularly updated.

In the offices, there have been several laboratory devices for laboratory measurements used and directly connected to the information system.

Conclusion: The technical support for diabetes care has enabled a complex care for diabetic patient at the general practitioner's office even in the critical situation when the number of diabetic patients is extremely increasing.

Keywords

General practitioner, Information system, Diabetes care, HbA1c measurement, Diabetic patient record

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1 Introduction

In the past, the care for diabetic patients in the Czech Republic was organized by the Czech Diabetology Society and the patients were treated by the diabetes specialists. The number of diabetic patients has increased from 2% to 8%. Perhaps another 2-3% of diabetics stay unrecognized and about 5% of patients have the prediabetes. To solve this problem the Ministry of Health and the General health insurance company decided to move the part of diabetes care to general practitioners. Since January 1st, 2010 the care for uncomplicated diabetic patients in the Czech Republic has moved from the diabetes specialists and it can be provided by the general practitioners. The history of computer support of diabetes treatment in the Czech Republic is very long [1, 2]. Nowadays, two new problems have to be solved: new training of general practitioners (GP) and the technological support of this new system of care.

2 Methods

To support the care for diabetic patients in the GP office the following tasks have to be solved:

1. To find and adopt some information systems to support diabetes care in the GP office,
2. To educate general practitioners about the diabetes,
3. To introduce new laboratory devices to GP office and to connect them to the information system.

3 Results

In most offices, there have been two types of information systems in use: PC DOKTOR [3], and MEDICUS [4].

The PC DOKTOR website [3] also includes a demonstration video of the system. The module for GPs includes:

- Automatic detection of diabetic patients,
- Forming of dispensarisation group,
- Filling of patient's data,
- Checking of frequency of clinical and laboratory investigations,
- Generation of reports for an insurance company,
- Insurance code generation,
- Sorting of diabetic patients,
- Prescription of drugs,

- Yearly summary of diabetes care for the Ministry of Health.

The system can minimize the losses made at the insurance reimbursement for the health care, as well as optimize the income of office. It also sets the correct frequency of investigations.

Fig. 1 The screen for investigation of diabetic patient in the PC DOKTOR system (4 parts):

- investigations to be done at each consultation,
- investigations to be done every 6 months,

Vyšetření pacienta s diabetem

DG: **E11.9** Užívá **INSUMAN BASAL 100 IU/ML INJ SUS 5X3ML/300UT**
 Dispenzarizace: **DIABETES NA DIETĚ, DISP. U PL od 06.11.2011**
 V péči lékaře: **MUDR. JOSEF PILULKA**

Datum: **06.11.2011** Poslední změna: **06.11.2011** Plánovaná disp. prohlídka: **06.05.2012**

každá prohlídka

Hmotnost: **72** (07.10.2011) Výška: **152** BMI: **31.16**
 Tlak: **111** (03.11.2011) Glykémie na lačno: **310** (03.11.2011) Glyk. 2 hod:

Užívaný lék: **INSUMAN BASAL 100 IU/ML INJ SUS 5X3ML/300UT** Dávka:
 Užívaný lék: Dávka:

Způsob léčby: **neuvadena**
 Inspekce DK: **fdsat** (03.11.2011)

1x za 3 měsíce do kompenzace DM, jinak 1x za 6 měsíců HbA1c: **1** mmol/l (03.11.2011)
každých 6 měsíců při zvýšené hladině cholesterolu, jinak 1x ročně

Cholesterol celkový: **500** (26.10.2011) HDL: LDL:
 Triacylglyceroly: TSH (fakultativně): fT4 (fakultativně):

Moč bakter.:

1x ročně

Urea: Na: K: Cl: Kys. močová:
 Kreatinin: AST: GMT: eGRD dle MDRD rovnice:

Mikroalbuminurie/proteinurie:
 Palpace tepen DK:
 Moč chemsed:
 Interní vyš.:
 EKG:
 Neurolog vyš.:
 Oční vyš.:

Komplikace

Netropatie není
 Netropatie
 s renální insuf.
 Retinopatie není
 Retinopatie
 proliferativní
 slepota
 Diab. noha není
 Diab. noha
 s amputací

Recepty
 Trvalé léky
 Ulož kons. vyš.
 Lab.výsledky
 Vývoj lab.hodnot
 Dispenzarizace
 Esc Zpět
 Ulož

Závěr, doporučení, ka. atd.: |fgfsdgsdgsdgsdfVýplněno bolestně na úraz ze dne Dg.: Č. pol.: TN: 07.10.2011 11:41 pátek Subj.: bolest žaludku

Výkony, které lze naučkovat

01201 Péče o stabilizovaného nekomplik. diabetika 2. typu
 09532 Prohlídka osoby dispenzarizované

01298 (VZP) Pac. odeslán k diabetologovi ke konzultaci
 01299 (VZP) Pac. odeslán k diabetologovi k dispenzarizaci
 13101 (VZP) Signální kód pro HbA1C nižší než 53 mmol/l
 13102 (VZP) Signální kód pro HbA1C v rozmezí 53-59 mmol/l
 13103 (VZP) Signální kód pro HbA1C od 60 mmol/l výše

Vlozte datum měření

Figure 1: Screen for investigation of diabetic patient in the system PC DOKTOR [3].

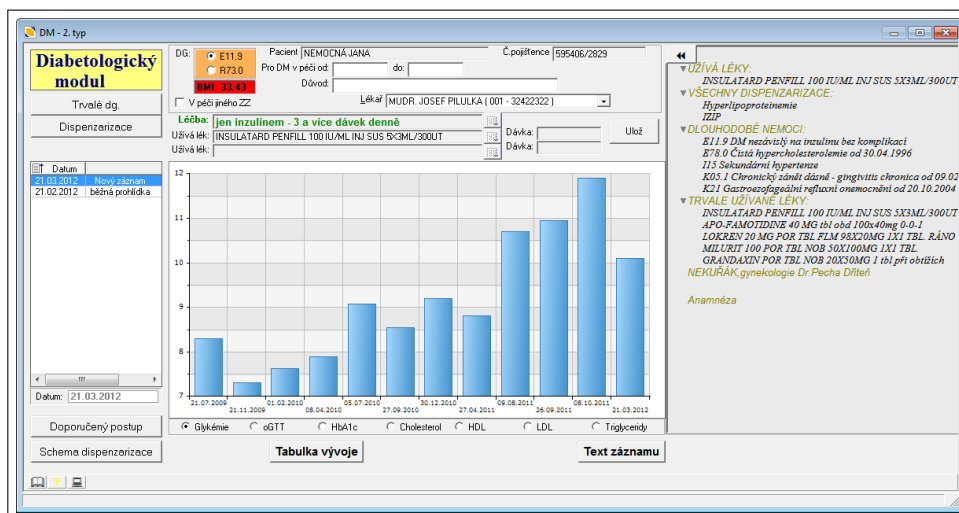


Figure 2: Review of laboratory data (blood glucose level) from one patient record [3].

- investigations to be done once a year,
- summary of insurance coding.

Fig 2 shows the summary of laboratory data from the record of one patient. The data can be filtered by investigation type – blood glucose level in this example.

To support the training of GPs two standards for “Diabetes“ and “Prediabetes“, concerning both diagnosis and treatment and evaluation of diabetic complications, have been defined, published, and also regularly updated on the Internet. The rules for sending the patients to the specialists are also included.

Several dry chemistry laboratory devices for laboratory measurements are used and directly connected to the system. The laboratory device has to be used directly in the GP’s office.

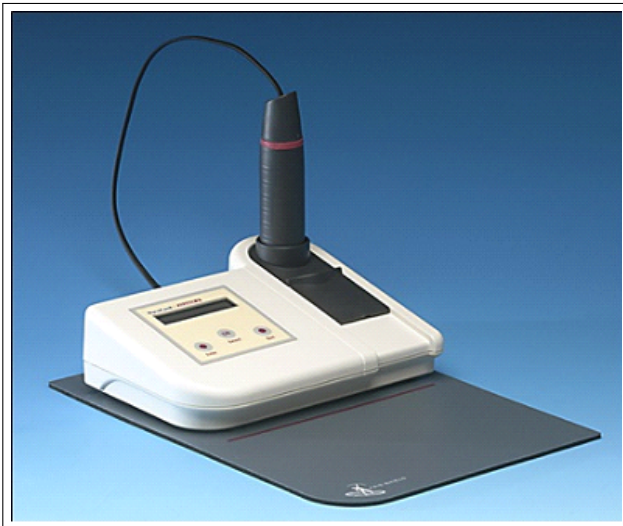


Figure 3: NycoCard Leader for HbA1c measurement.

The Quick Seal system enables to measure several parameters:

1. CRP – laboratory evaluation of the inflammation presence,
2. INR – coagulation test,
3. FOB – test for blood in stool,
4. HbA1c – long-term parameter of diabetes compensation,
5. Micro albuminuria – early detection of diabetes complications.



Figure 4: Quick Seal system Smart 700/340.

Both devices are used and directly connected to the information system in the office. Many systems for home blood glucose measurements done by the patients (glucometers) are also used. Data can be recorded to the information system from the patient’s device.

4 Conclusion

The technical support for diabetes care has enabled a complex care for diabetic patient even in the critical situation when the number of diabetic patients is extremely increasing. Using the information system support, the general practitioners have been able to perform high quality care for diabetic patients.

References

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