



## **Effectiveness of a Chronic Care Management Programme for Patients with Type 2 Diabetes mellitus**

**Mascha Bethke, Eva Blozik, Nicole Toelle, Jan von Overbeck  
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# Swiss Center for Telemedicine

[www.medgate.ch](http://www.medgate.ch)

- Modern teleconsultation center in Basel
- The largest telemedical center in Europe run by medical professionals
  - Overall, up to 4'300 patient encounters per day
  - More than 2.5 million patient encounters since the start in October 2000
  - Telephone, Internet, video-conferencing and telemonitoring
- The medical setting is primary health care, similar to that of a general physician

# Medgate Chronic Care Management

- Medgate specializes in the provision of telemedical care to patients with chronic illnesses, such as:
  - **Arterial hypertension**
  - **Congestive heart failure**
  - **Diabetes mellitus type 2**
  - **Obesity and overweight**
- Patients benefit from:
  - structured **educational programs** that are specific to their illness while also addressing overlapping illnesses
  - **optimization of treatment**
  - **individual coaching**
  - ongoing **telemedical monitoring of the bodily functions** relevant to the course of the illness through the MEDGATE Telelabor if indexed

# Individualization

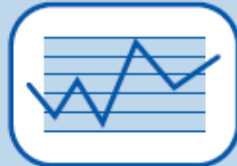
- ▣ Focusing on patients not on the disease
- ▣ MSOG technology
  - Multiple Sensor One Gateway
- ▣ Modular programs
- ▣ Integration of GPs
- ▣ Integration of existing diabetes counselling: Schweizerische Diabetes-Gesellschaft (Swiss Diabetes-Association)
  - incl. education in groups



# Chronic Care Management (CCM)

Individual combination of modules for each patient

## Modular Structure of Intervention



Tele-  
biometrie



Alarm



Basis-  
untersuchung



Schulung



Coaching

**Telemonitoring**

**Consultation**

**Education + Coaching**



GP or Medgate



GP or specialist



GP or Medgate and/or Diabetes-Nurse

# Modular Approach

## For patients with type 2 diabetes

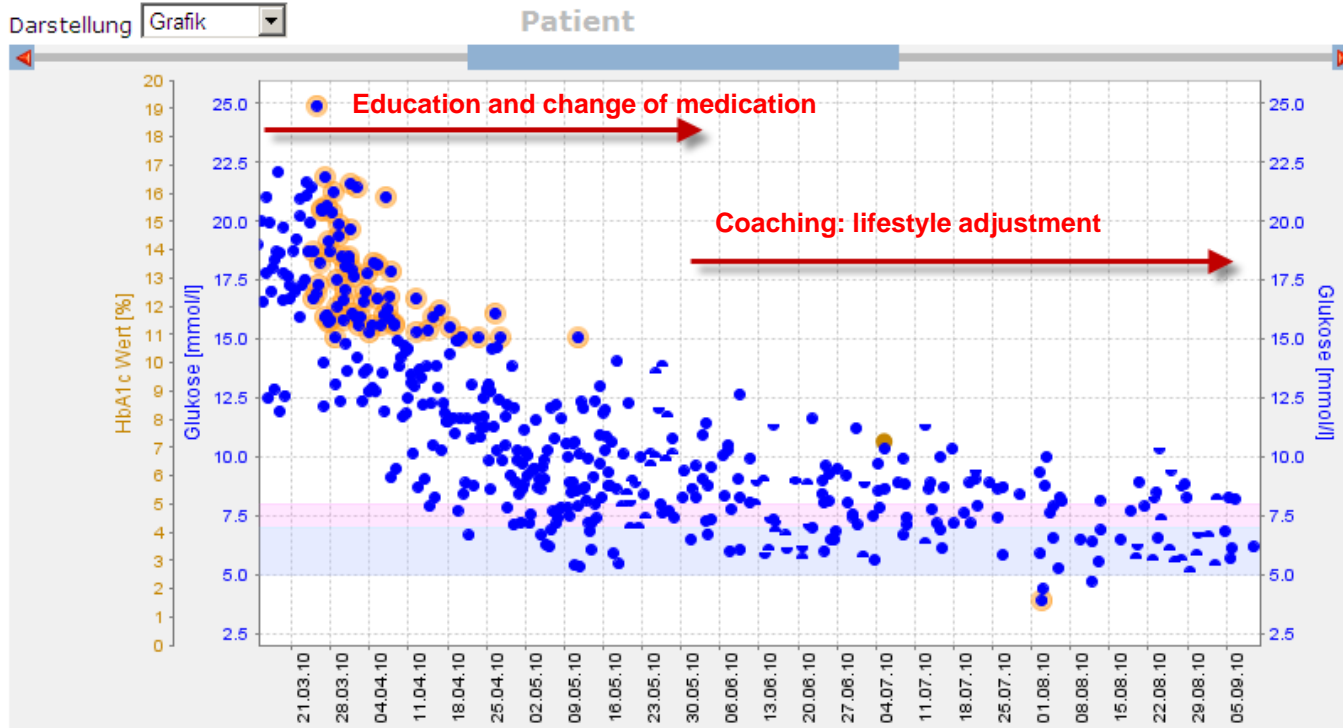
- Consultation, physical examination and laboratory values at the GP's practice: **check-up** and «bench marks»
- Information and education: **patient empowerment**
  - at the GP's practice
  - on the phone by Medgate
  - education in groups by the Swiss Diabetes Association
- Individual coaching by phone (Medgate): **changing lifestyle**
- Telemonitoring if required and necessary: **education and change of medication**
  - GP, specialist (diabetologist) or Medgate
- Addition of further disease-modules possible, such as hypertension: **prevention of complications**

# Change of Medication with Telebiometry

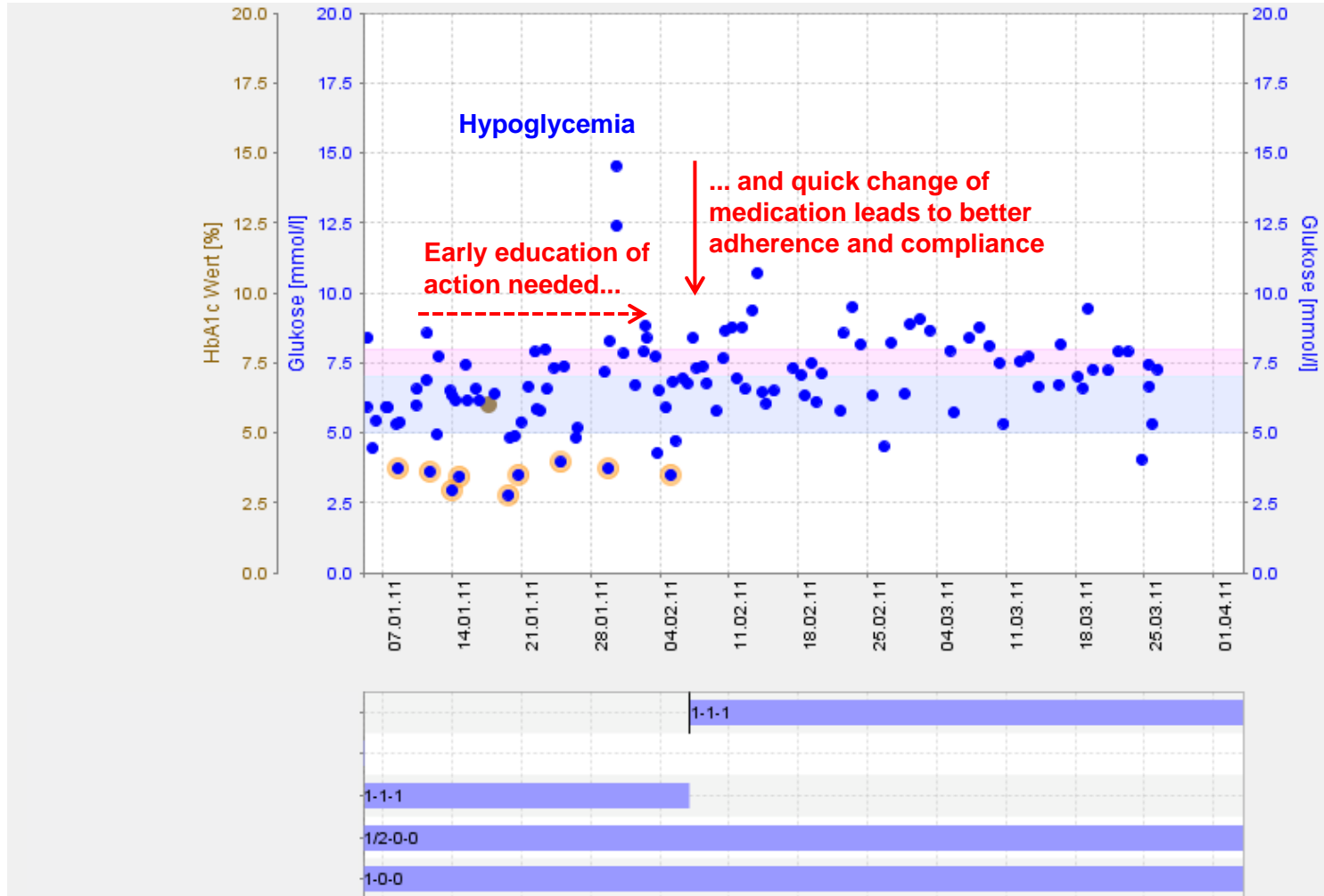
## Diabetes mellitus type 2: glucose-monitoring

Patientenliste · Alarmverwaltung ·

Übersicht | Stammdaten | Dokumente | Gewicht | Blutdruck | **Blutzucker** | Lunge | Pulsoximetrie | Blutgerinnung | EKG | Nachrichten



# Alarm Management – Timely Response Hypoglycemia





## Baseline Characteristics

144 patients started with the programme, 4 patients interrupted it

▣ N = 123 patients completed the programme until evaluation date, with a maximal duration of 1 year

▣ N = 84 male (68.3%)

▣ N = 39 female (31.7%)

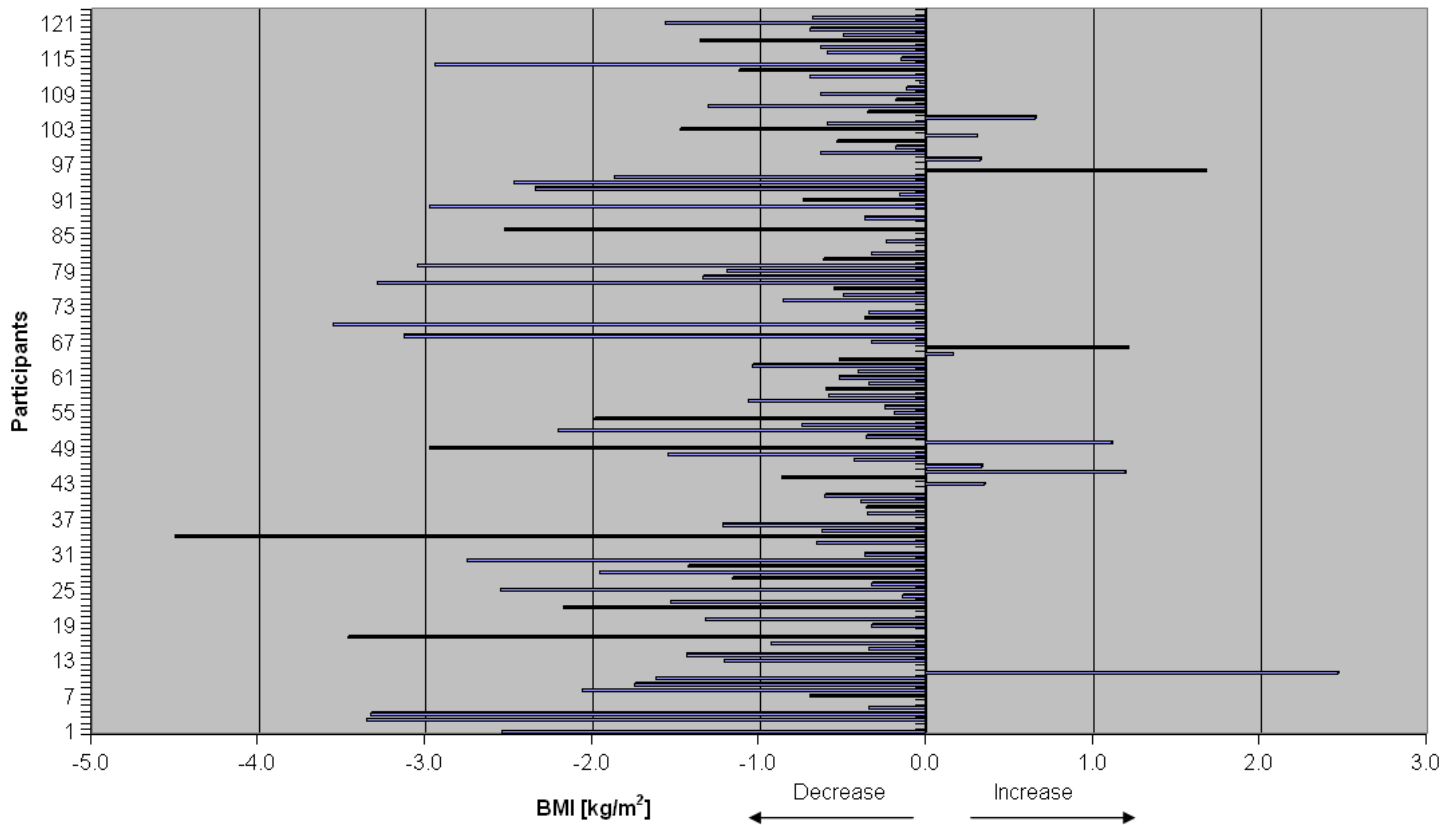
▣ Mean age: 60 ± 8 years (range: 33 - 75 y)

## Descriptive Evaluation (N = 123)

- Mean duration of participation:  $233.8 \pm 101$  days
- Mean BMI      start:  $30.5 \pm 5.3$  kg/m<sup>2</sup> (range: 19.8 - 47.8)  
                    end:  $29.7 \pm 5.2$  kg/m<sup>2</sup> (range: 19.5 - 46.3)
- Mean HbA1c: start:  $7.3 \pm 1.4\%$                     (range: 4.9 - 13.5)  
                    end:  $6.8 \pm 0.9\%$                         (range: 5.0 - 9.8)

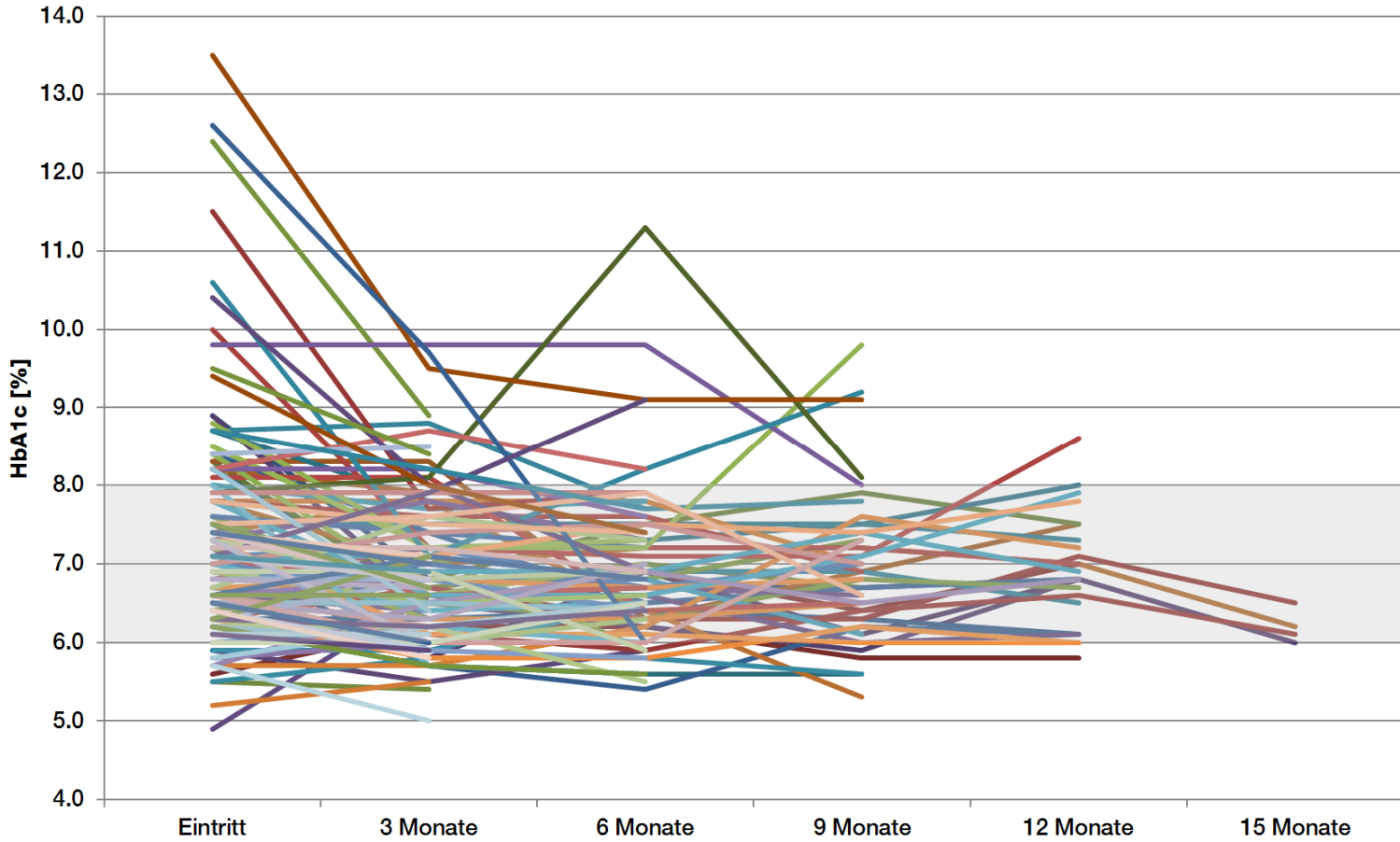
# Descriptive Evaluation

## Improvement of the Body Mass Index by lifestyle adjustment



# Descriptive Evaluation

## Glycosylated hemoglobin: HbA1c



# Conclusion

- **Telemedical Chronic Care Management is very effective to improve management of type 2 diabetes**
  - Patient empowerment, information and education
  - Collaboration among medical staff is crucial
  
- **Further studies are needed to:**
  - Investigate long term impact of chronic care management programs
  - Assess long term outcomes (i.e. cardiovascular events, mortality)



**Thank you for your attention**