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CGMS™ in combination with KADIS® has a high potential to improve out-patient diabetes care

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[2]Ajman University of Science and Technology Network, Ajman, UAE

The World Congress on **C**ontroversies in **O**besitas, **D**iabetes and **Hy**pertension (**CODHy**)
October 26-29 2006, Berlin, Germany

Background

Proof of concept, technology and acceptance for:

- ✓ **CGMS™**, continuous 72-hour glucose monitoring
- ✓ **KADIS®**, a patient-centred advisory system applicable as decision support for GP's with diabetic patients
- ✓ **TeleDIAB®**, a telemedicine-based communication system for Integrated Diabetes Care

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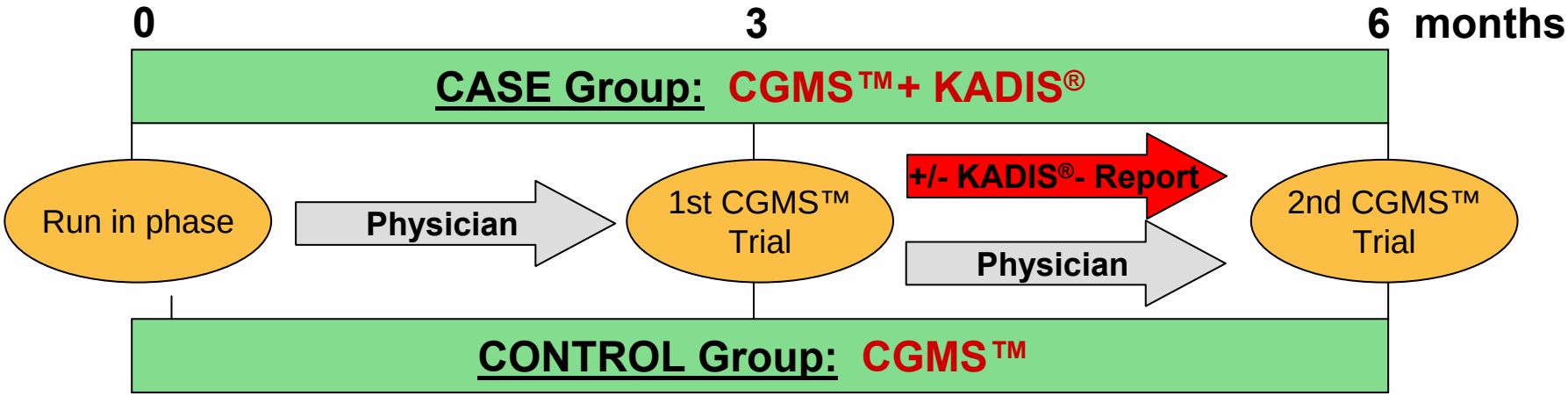
Research Design and Methods

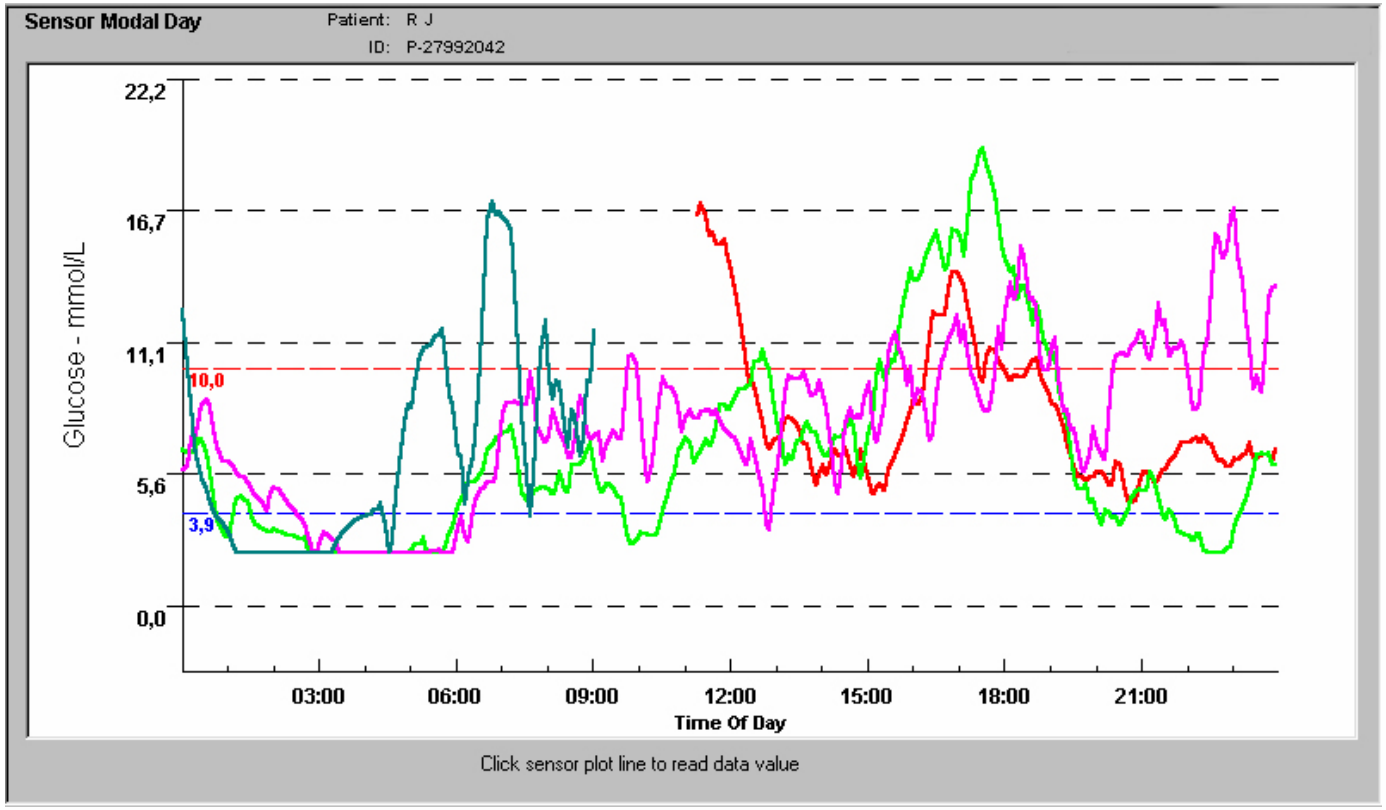
I. Design:



- Multi-centric case/control study with 5 outpatient centres
- Insulin-treated diabetics (n=62), Age 17-75 years,
- Randomization for CGMS™- or CGMS™+ KADIS®-based decision support

II. Methods:

(1) Continuous 72h-blood glucose monitoring



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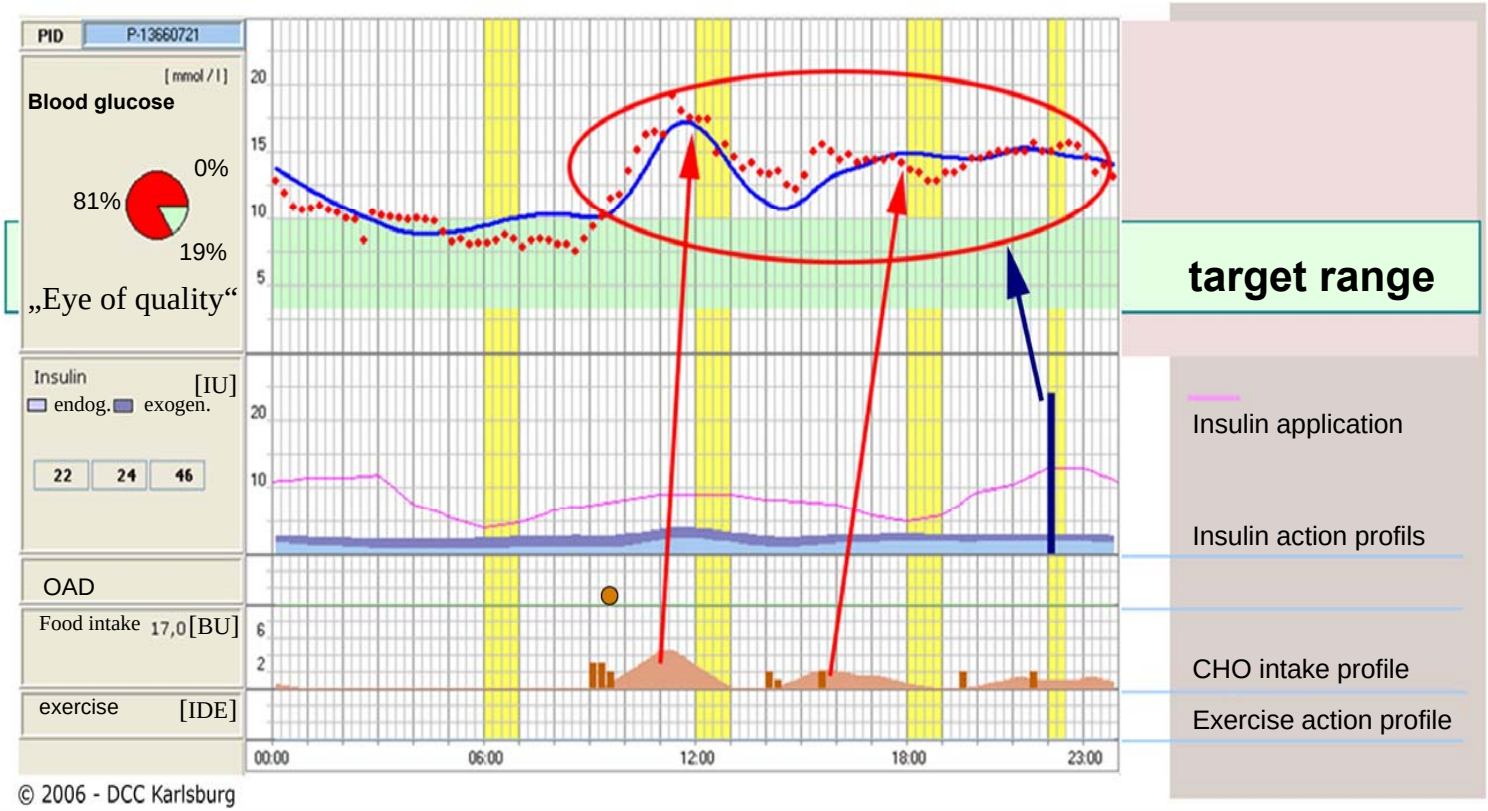
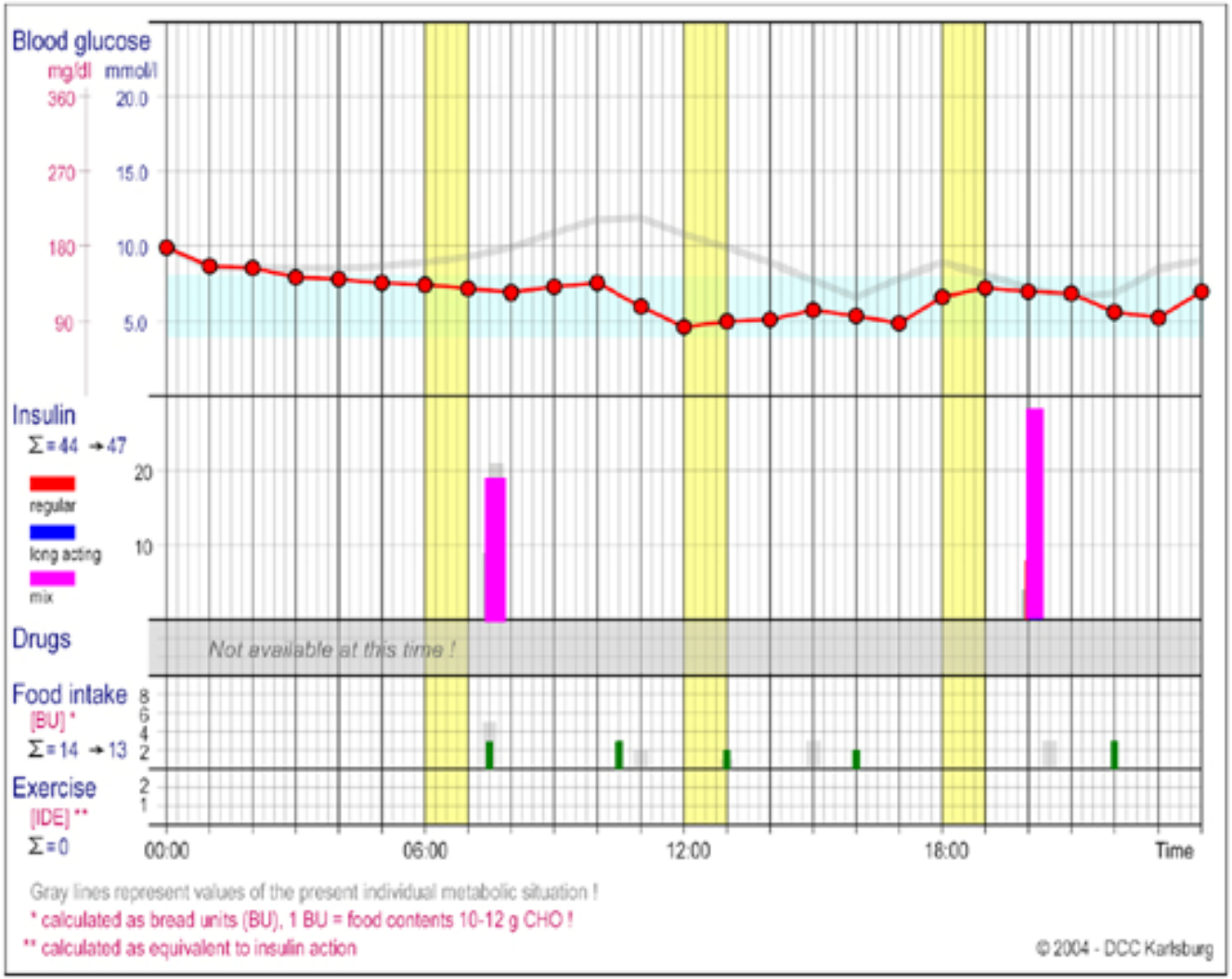
(2) Charateristic blood glucose profile CTP, the „Metabolic Finger-Print“ estimation and weak point analysis

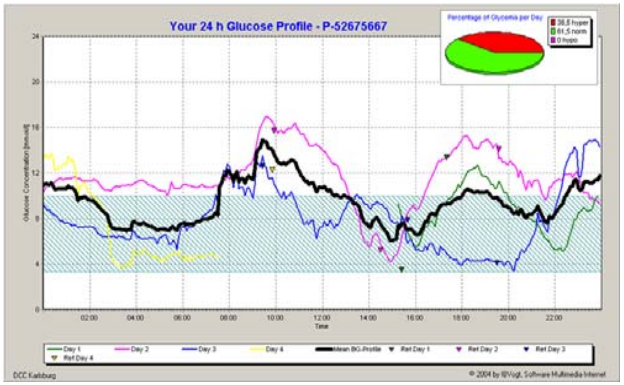


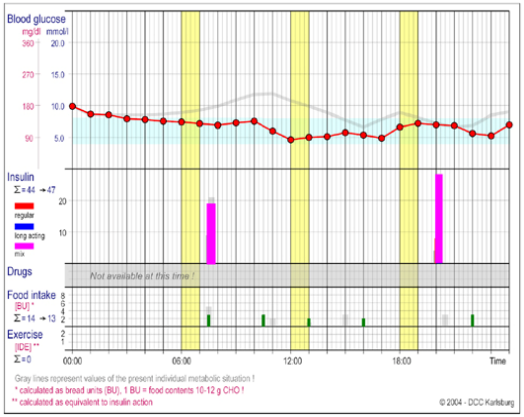
(3) KADIS® - Report

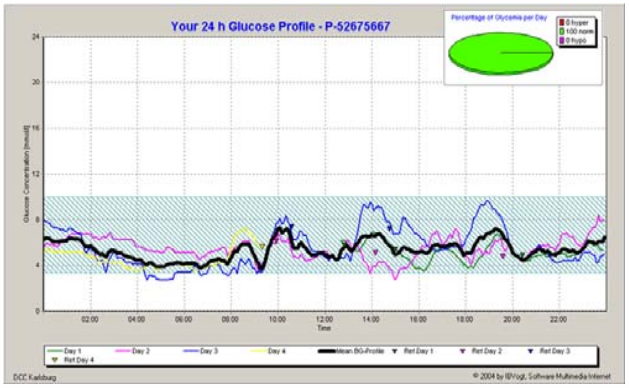


(4) Application of KADIS®-based recommendations

at baseline → 3 months later







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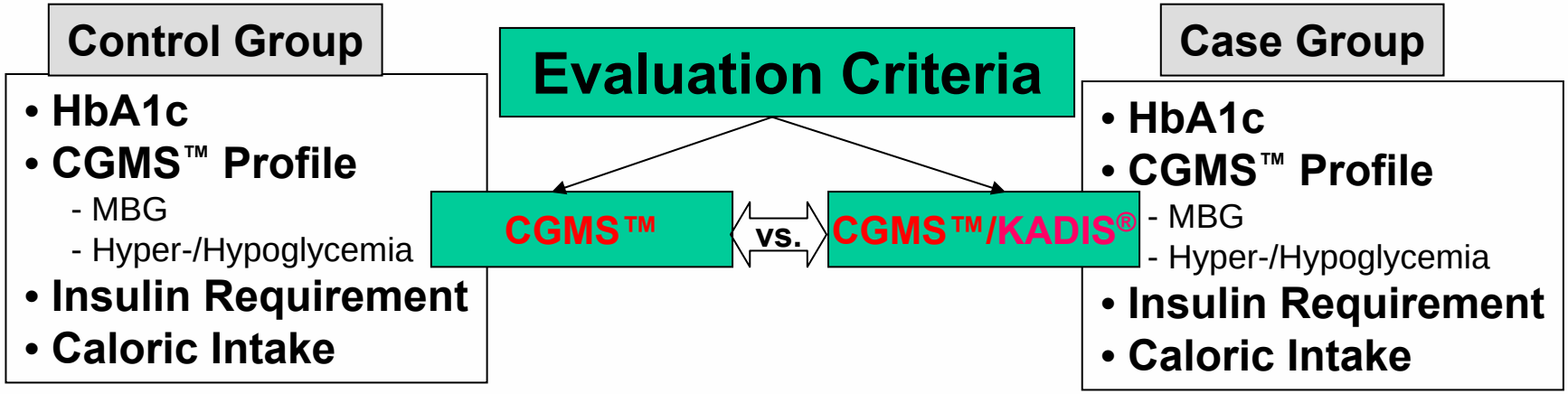
III. Statistics:

Verification of the **outcome:** HbA1c (%), MBG (mmol/L) and hyperglycemia (h/day)] by **matching** for HbA1c and MBG at baseline



N = 31

N = 31

IV. Patient demographics

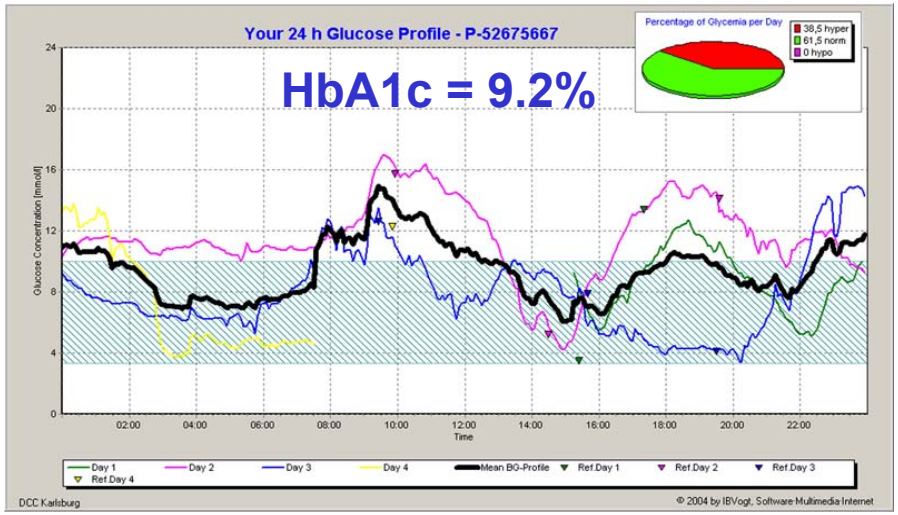
Parameter	CGMS™	CGMS™/KADIS®
N	31	31
Sex (f/m)	15/16	14/17
Age (y)	47.5 ± 2.4	45.5 ± 2.5
Diabetes duration (y)	12.2 ± 1.9	13.7 ± 1.6
BMI (kg/m^2)	30.1 ± 1.4	31.5 ± 1.1
Diabetes type (1/2)	19/12	14/17
Insulin (IU)	59.0 (37–76)	53.0 (34–80)
Diabetes specialist/ General practitioner	26/5	18/13

RESULTS

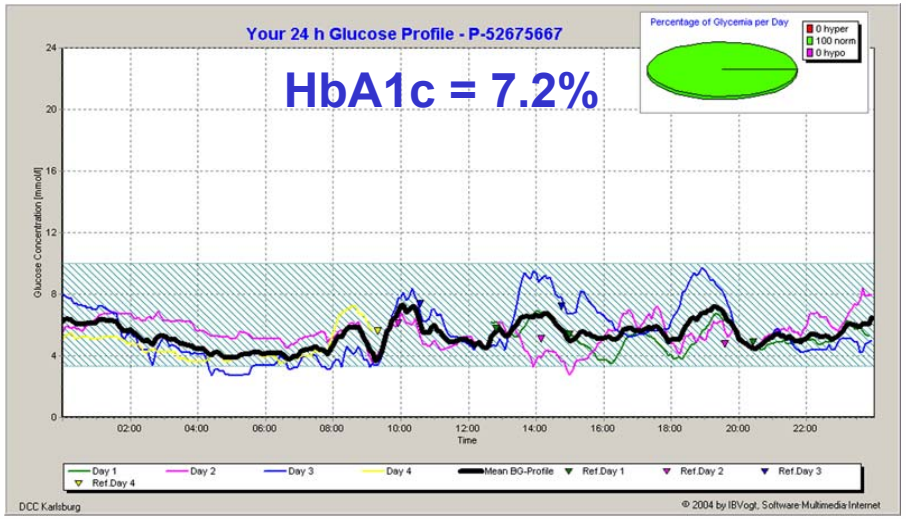
Type 1 Diabetes

Before & After Application of CGMS™/ KADIS®-based Recommendations

P-52675667
Gender: f
Age: 20 years



1st CGMS™/KADIS® Trial



2nd CGMS™/KADIS® Trial

Two CGMS™ Trials, <u>3 months apart</u> in a type 1 diabetic volunteer before and after application of KADIS®-based recommendations

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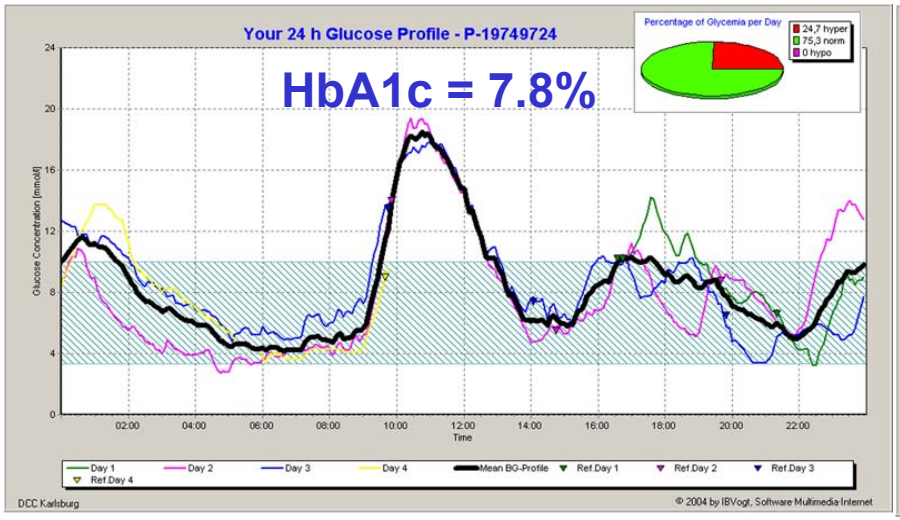
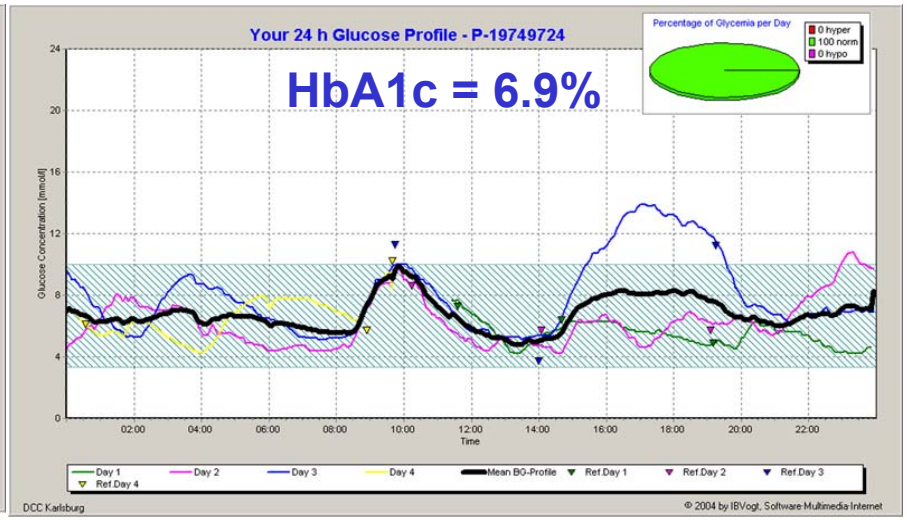
Type 2 Diabetes

Before & After Application of CGMS™/KADIS®-based Recommendations

P-19749724
Gender: m
Age: 49 years





1st CGMS™/KADIS® Trial **2nd CGMS™/KADIS® Trial**

Two CGMS™ Trials 3 months apart in a type 2 diabetic volunteer before and after application of KADIS®-based recommendations

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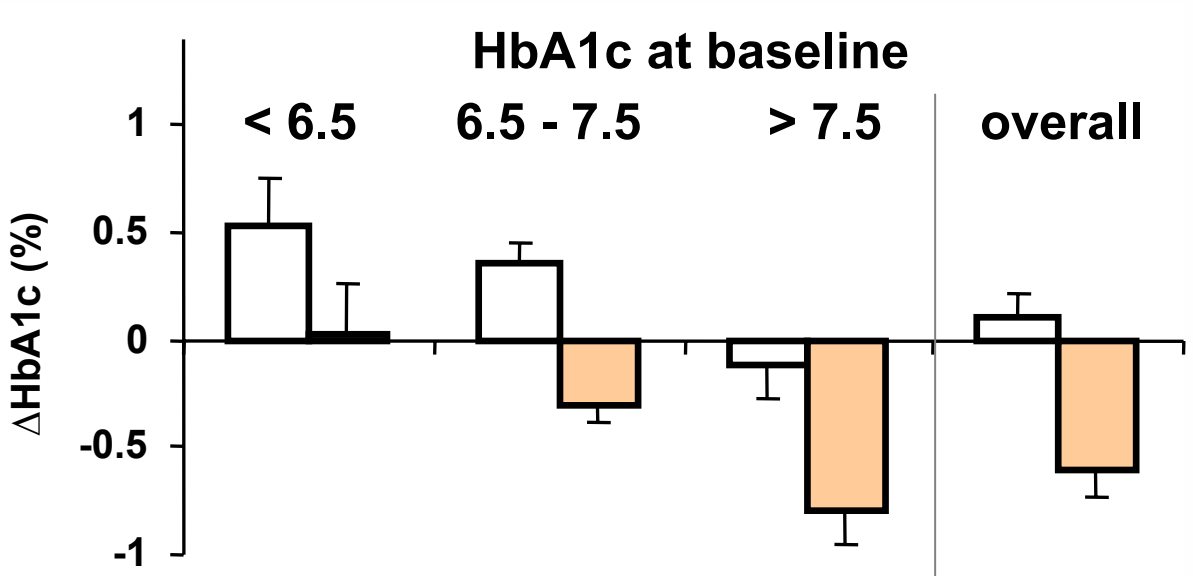
Outcome: HbA1c



Change in HbA1c within 3 months				
CGMS™	6.0 → 6.5	7.2 → 7.6	8.6 → 8.5	7.9 → 8.0
CGMS™/KADIS®	6.1 → 6.1	7.2 → 6.9	8.5 → 7.7	8.0 → 7.4
net KADIS® effect	**0.5 ± 0.3**	**0.7 ± 0.1****	**0.6 ± 0.2****	**0.7 ± 0.2****

*p< 0.05; ** p< 0.01

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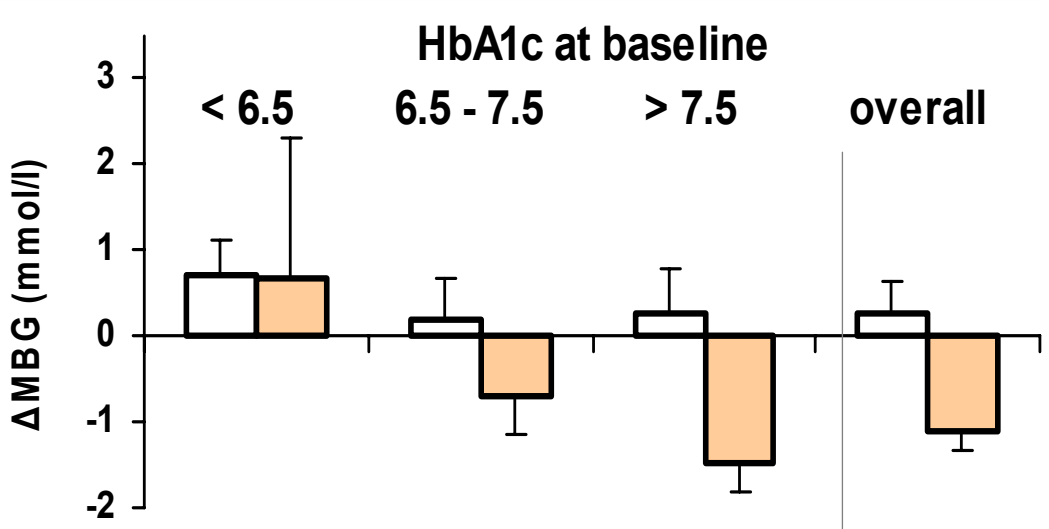
Outcome: Mean Blood Glucose (MBG)



Change in MBG within 3 months				
CGMS™	6.0 → 7.3	8.4 → 8.6	9.1 → 9.4	8.6 → 8.9
CGMS™/KADIS®	6.7 → 7.3	8.0 → 7.3	9.2 → 7.7	8.7 → 7.6
net KADIS® effect	**0.1 ± 1.7**	**0.8 ± 0.7**	**1.7 ± 0.6****	**1.4 ± 0.5****

*p< 0.05; ** p< 0.01

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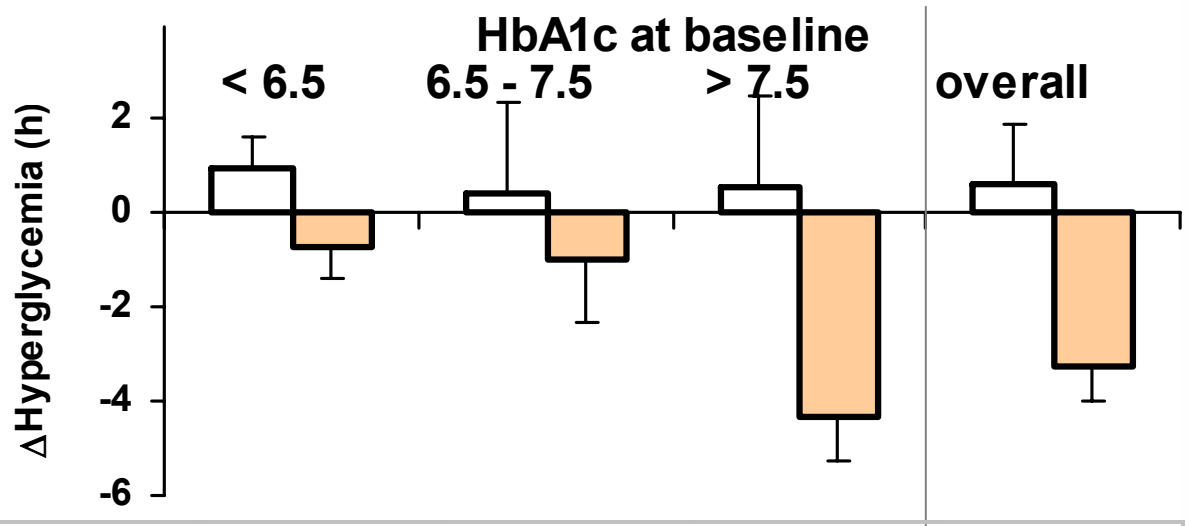
Outcome: Hyperglycaemic Episodes (h/day)



Change in duration of hyperglycemia within 3 months				
CGMS™	0.6 → 1.6	5.5 → 6.1	7.7 → 8.2	6.2 → 6.8
CGMS™/KADIS®	0.7 → 0.0	4.4 → 3.3	8.7 → 4.3	6.9 → 3.7
net KADIS® effect	**1.7 ± 0.9**	**1.7 ± 2.3**	**4.8 ± 2.0***	**3.8 ± 1.4***

*p< 0.05; ** p< 0.01

Conclusion

- ✓ Applicability of the combined KADIS®/CGMS™ approach
- ✓ Implication as powerful tool for out-patient diabetes care
- ✓ Proof of concept, technology and acceptance for a

Integrated Diabetes Health Care Network

providing KADIS®/CGMS™/TeleDIAB®
for out-patient diabetes care

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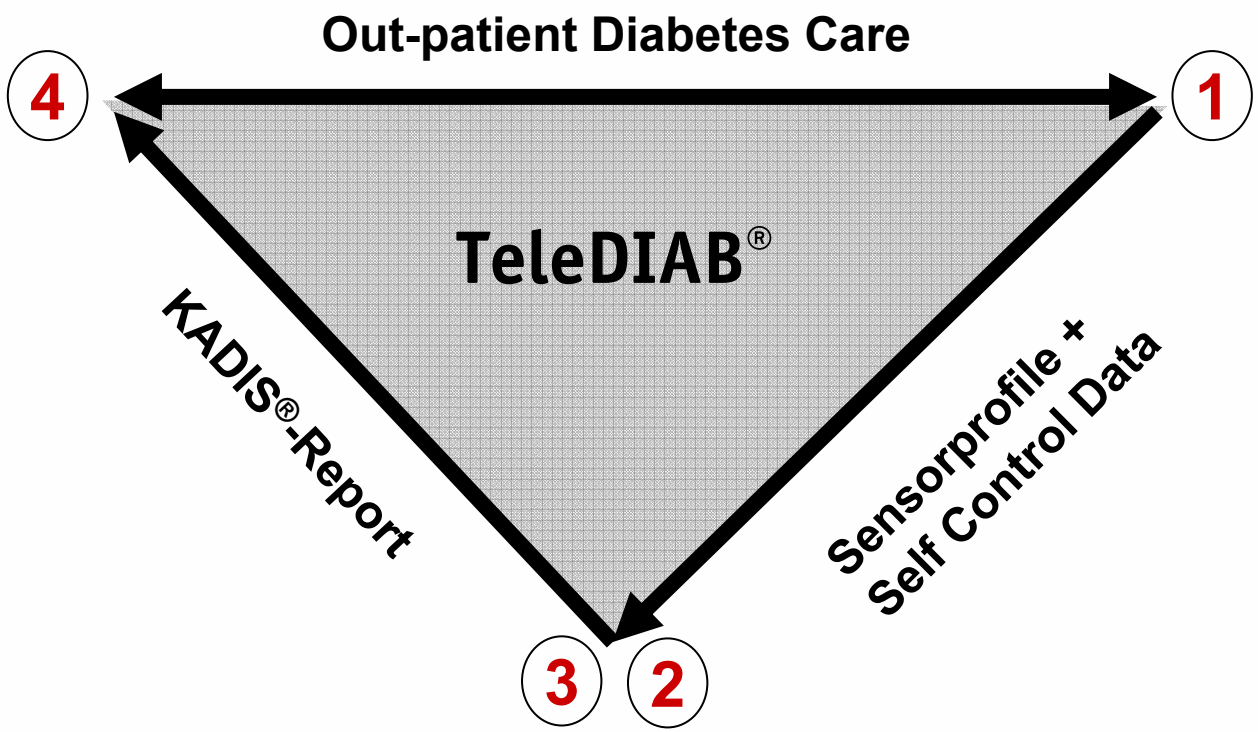
Integrated Diabetes Health Care Network

Physician/ Patient: Application of CTP and KADIS® - Report



CGMS™ Monitoring: Patient at home

DCC®: Generates the patient specific CTP („Metabolic Finger-Print“) and provides recommendations to optimize metabolic control (The KADIS®-Report)

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Further Activities

Establishing the
Integrated Diabetes Health Care Network (IDN)

Services, which will be provided by the IDN:

(1) Continuous 72h-glucose monitoring under daily life conditions
(2) Estimation of the patient specific CTP ("Metabolic Finger-Print") including "Weak Point" analysis
(3) Generation of evidence-based recommendations to overcome the identified weak points (KADIS®-Report)
(4) Application of KADIS®-based recommendations

The generous support of this study by grants of the German Ministry for Education and Research (BMBF) and Medtronic MiniMed Inc., Northridge, USA, is highly appreciated

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