



*Improvement on Outcomes of Overweight Type 2
Diabetics after an Enhanced Disease Management
Programme*

Presented by

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NTW Diabetes Centre

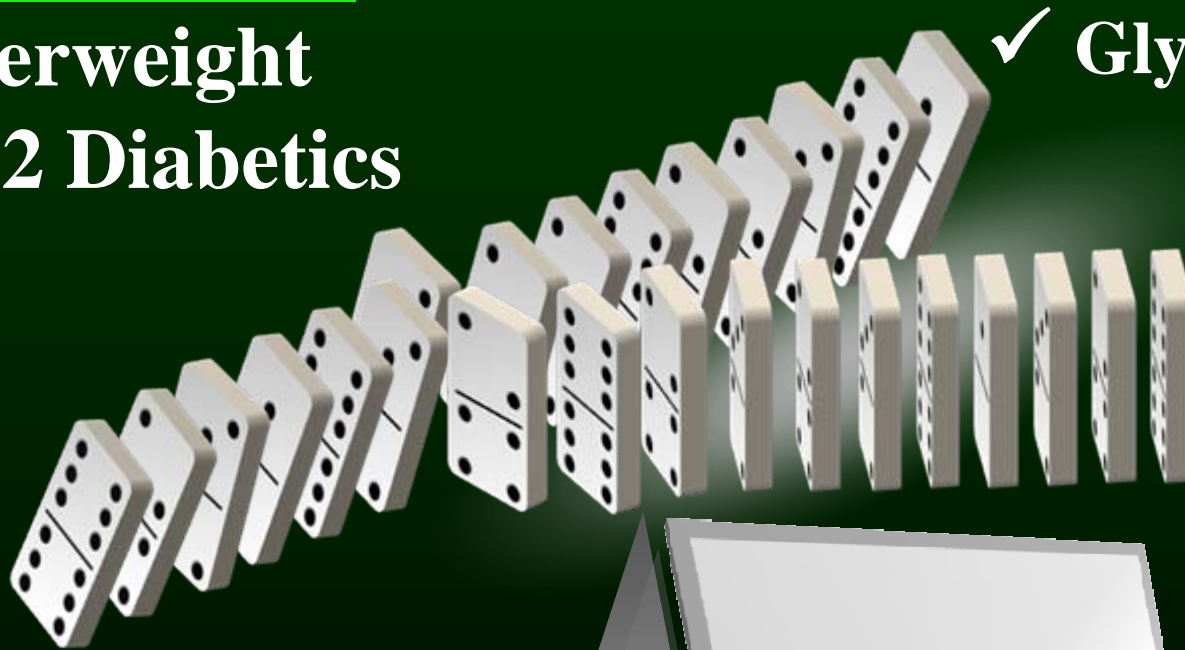
Background

Target group:

Overweight
Type 2 Diabetics

Outcome:

Glycaemic control ✓



Reduction on
body fat

Integrated Patient Care Plan
(IPCP) since 2004, POH

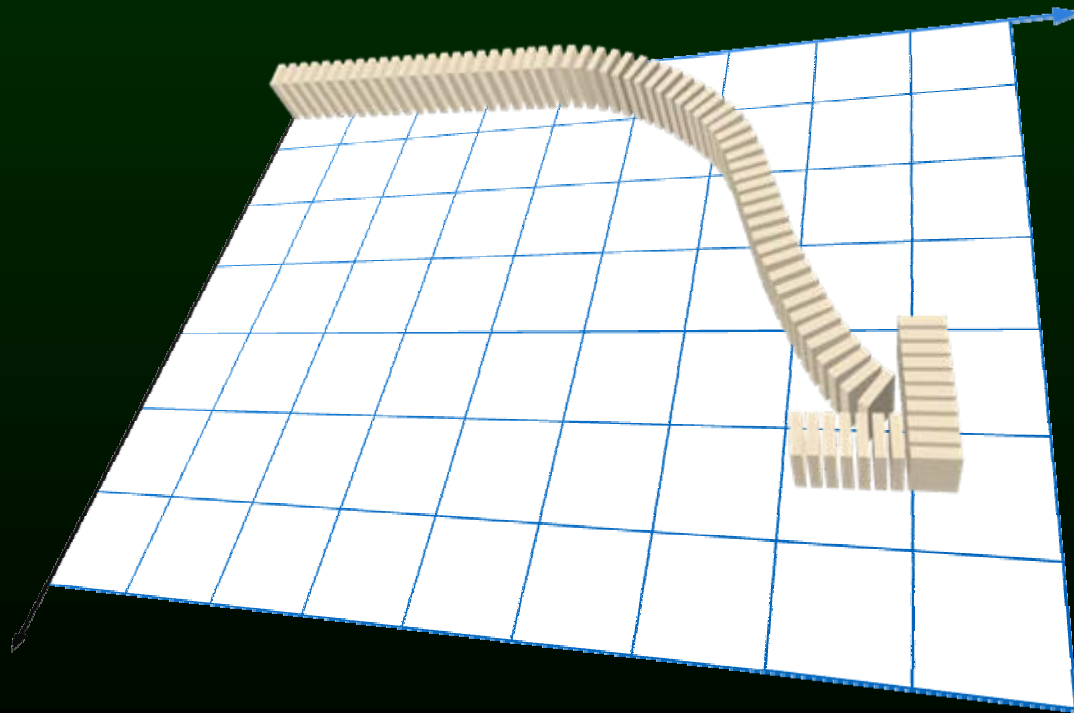
Endocrinologist
Family physician
Diabetes nurse
Dietitian

+

Physiotherapist class
in Aug, 2008

Objective of current study

To evaluate the impact of enhanced diabetes management programme on patient outcomes



Obesity

Subjects

■ **Inclusion Criteria:**

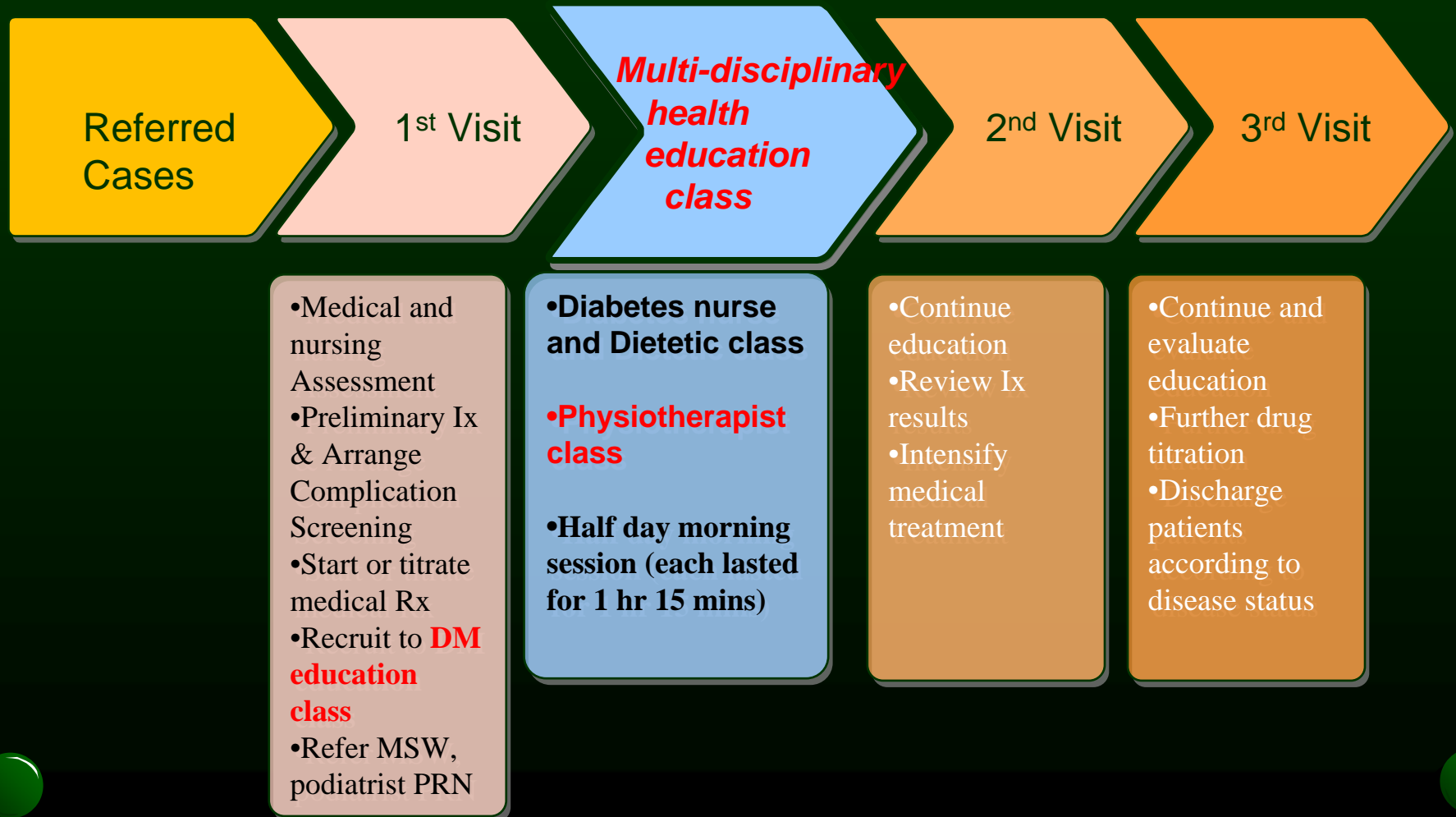
- ❖ **Newly referred Type 2 DM and never received formal diabetes education**
- ❖ **GOPC / FMSC cases with poor DM control**

■ **Exclusion Criteria:**

- ❖ **Significant mental or physical disability**
- ❖ **Limited life expectancy/ poor quality of life**
- ❖ **Co-existing disease requiring other specialist care**

Flow Diagram of Enhanced Diabetes Management Programme

One stop service: facilitate patients' compliance & minimize internal wastage due to default



Recruitment to Physiotherapist Class

1. Pre-exercise screening (by Senior Family Physician)

- × Physical immobility
- × Identify and exclude patient with contraindications to exercise e.g. history of IHD, MI
- ✓ Overweight with BMI > 28 Kg /m²

2. Monitoring during Physiotherapist Class (by Physiotherapist)

- ❖ Close monitoring of physical condition (BP, Histix, Heart rate)
- ❖ Emergency support from Family physician if patient's condition change

Physiotherapist Class

Exercise Education (20 mins)



Goal Setting (10 mins)



Guidance on Physical Training Equipments (45 mins)



Methods

- From 7/8/2008 to 21/5/2009, Type 2 diabetics who FU FMDM clinic were recruited.
- Pre & Post outcome indicators measured:
 - 1) Biochemical data (including BW, BMI, Blood pressure, HbA1c, Lipid profile)
 - 2) Anthropometrics (Body Fat Composition)



Methods

- 3) **Physical fitness data (Hand grip strength and Heart rate of Young Men Christian Association (YMCA) step test) by physiotherapist**

- 4) **Chinese Diabetes Empowerment Scale (DES)**
 - Quoted from “Shiu, A.T.Y., Wong, R.Y.M., and Thompson, D.R. (2003). Development of a Reliable and Valid Chinese Version of the **Diabetes Empowerment Scale**, Diabetes Care, 26 (10), p.2817-2821”

 - A questionnaire with 20-item Chinese DES including five subscales: overcoming barrier, determining suitable methods, achieving goal, obtaining support and coping

- 5) **Diabetes Knowledge Score (DKS)**
 - A questionnaire (total 10 questions) developed by Diabetes nurse, dietitian and physiotherapist

Results

Total no. of patients being recruited: 207

<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>
n=139	n=36	n=32
A. DM nurse B. Dietitian C. Physiotherapist class A+B+C	A. DM nurse B. Dietitian A+B	Refused all multi- disciplinary health education class X

Baseline characteristics (1)

	Group1 n = 139	Group 2 n = 36	Group 3 n = 32	Group 1 vs Group 2 p-value *	Group 1 vs Group 3 p-value *
Body Weight(baseline) kg	70.3 ± 14.8	65.3 ± 12.2	64.2 ± 14.1	0.063 (ns)	0.035
BMI (baseline) Kg/m²	26.3 ± 4.4	25.3 ± 4.4	25.1 ± 4.0	0.207 (ns)	0.168 (ns)
Body Fat composition (baseline) %	28.2 ± 8.1	27.7 ± 9.9 (n=33)	29.1 ± 8.4	0.753 (ns)	0.603 (ns)
SBP (baseline) mmHg	131 ± 20.1	132 ± 19.8	138 ± 20.7	0.678 (ns)	0.066 (ns)
DBP (baseline) mmHg	78 ± 12.3	80 ± 13.3	82 ± 11.6	0.589 (ns)	0.113 (ns)
Mean of HbA1c (baseline) %	8.3 ± 1.9 (n=138)	8.8 ± 2.3 (n=29)	7.9 ± 1.8 (n=27)	0.146 (ns)	0.354 (ns)

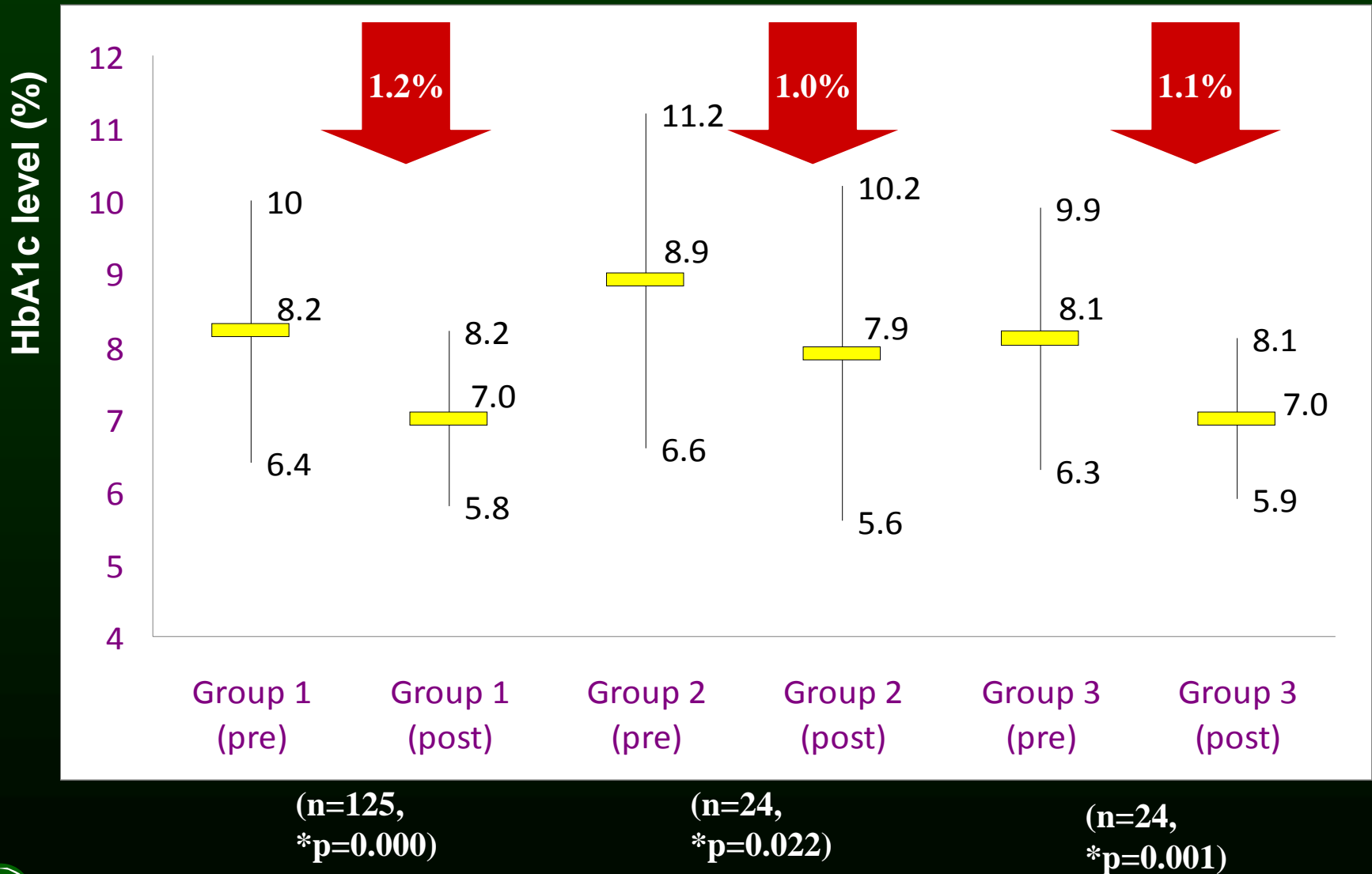
* Independent t-test, result of Gp 1 vs Gp 2; Gp 1 vs Gp 3

Baseline characteristics (2)

	Group1 n = 139	Group 2 n = 36	Group 3 n = 32	Group 1 vs Group 2 p-value *	Group 1 vs Group 3 p-value *
TC (pre) mmol/L	5.1 ± 1.0 (n=139)	5.7 ± 0.9 (n=32)	4.9 ± 0.9 (n=27)	0.002	0.392 (ns)
LDL (pre) mmol/L	3.1 ± 0.8 (n=132)	3.6 ± 0.7 (n=29)	2.8 ± 0.8 (n=26)	0.004	0.09 (ns)
HDL (pre) mmol/L	1.2 ± 0.3 (n=138)	1.3 ± 0.3 (n=32)	1.3 ± 0.3 (n=27)	0.511 (ns)	0.143 (ns)
TG (pre) mmol/L	1.8 ± 2.2 (n=138)	2.0 ± 1.7 (n=32)	1.7 ± 1.3 (n=27)	0.693 (ns)	0.761 (ns)
Mean of Diabetes Knowledge Score (pre)	6.5 ± 2.2	5.7 ± 2.2 (n=34)	5.9 ± 2.8 (n=31)	0.056 (ns)	0.281 (ns)
Mean of Diabetes Empowerment Scale (pre)	77.9 ± 8.9 (n=138)	76.5 ± 8.9 (n=30)	78.9 ± 7.6 (n=30)	0.429 (ns)	0.590 (ns)

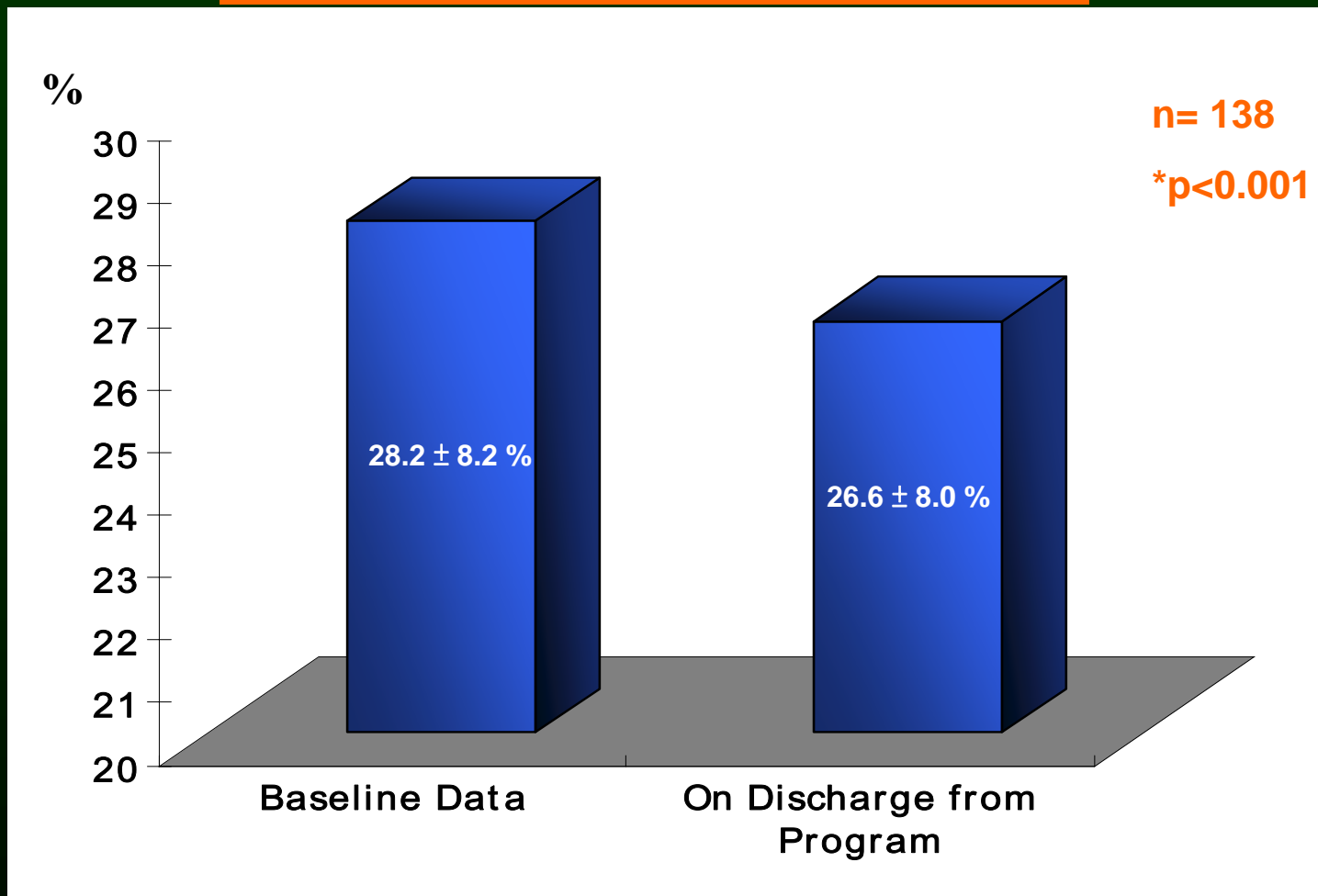
* Independent t-test, result of Gp 1 vs Gp 2; Gp 1 vs Gp 3

Reduction of Mean HbA1c among 3 groups



* paired t-test, baseline compared with post result in 3 groups

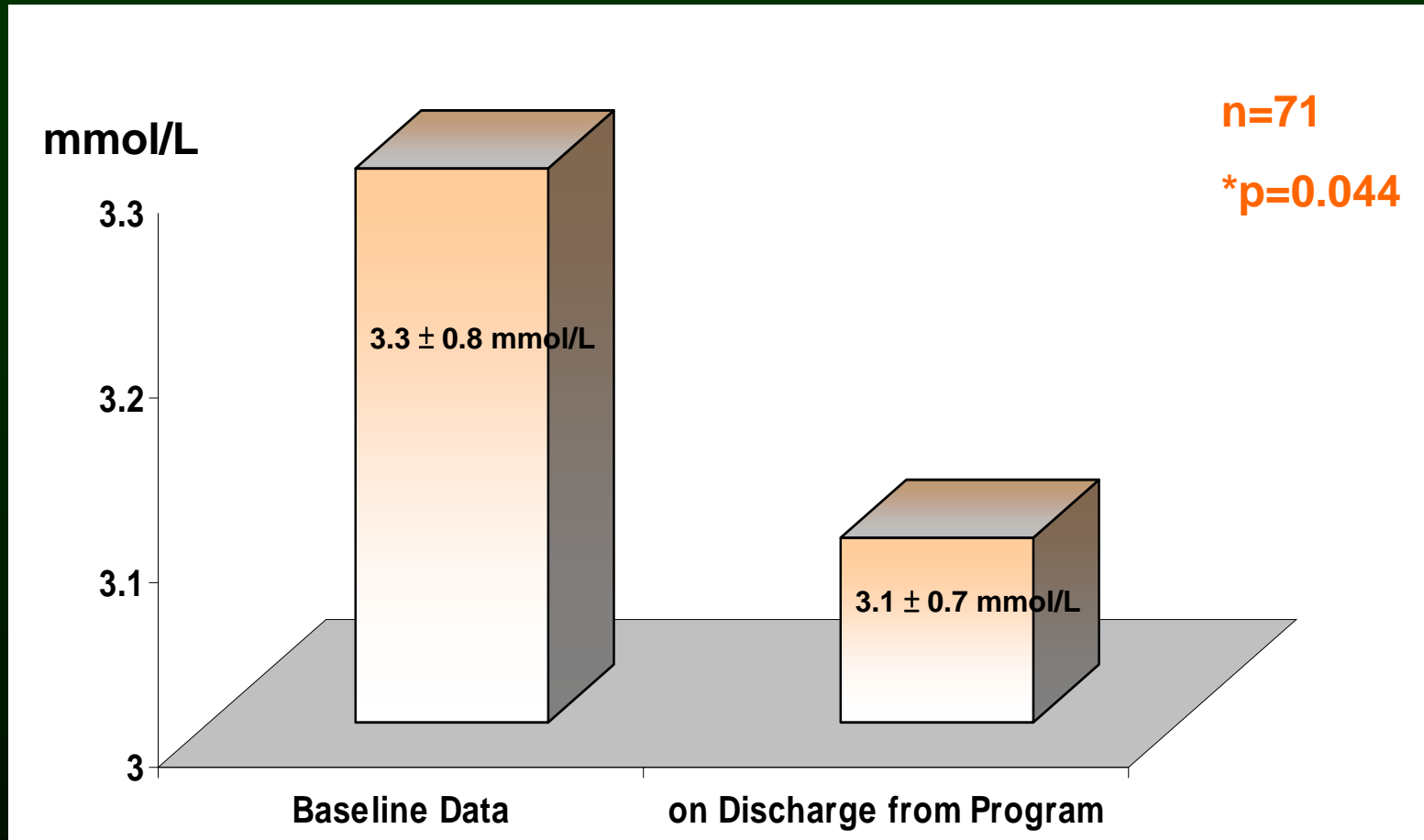
Reduction of Body Fat Composition by 1.6% after programme



Group 1

** Paired t-test, results vs baseline*
Gp 2 & 3 pts not showing significant improvement

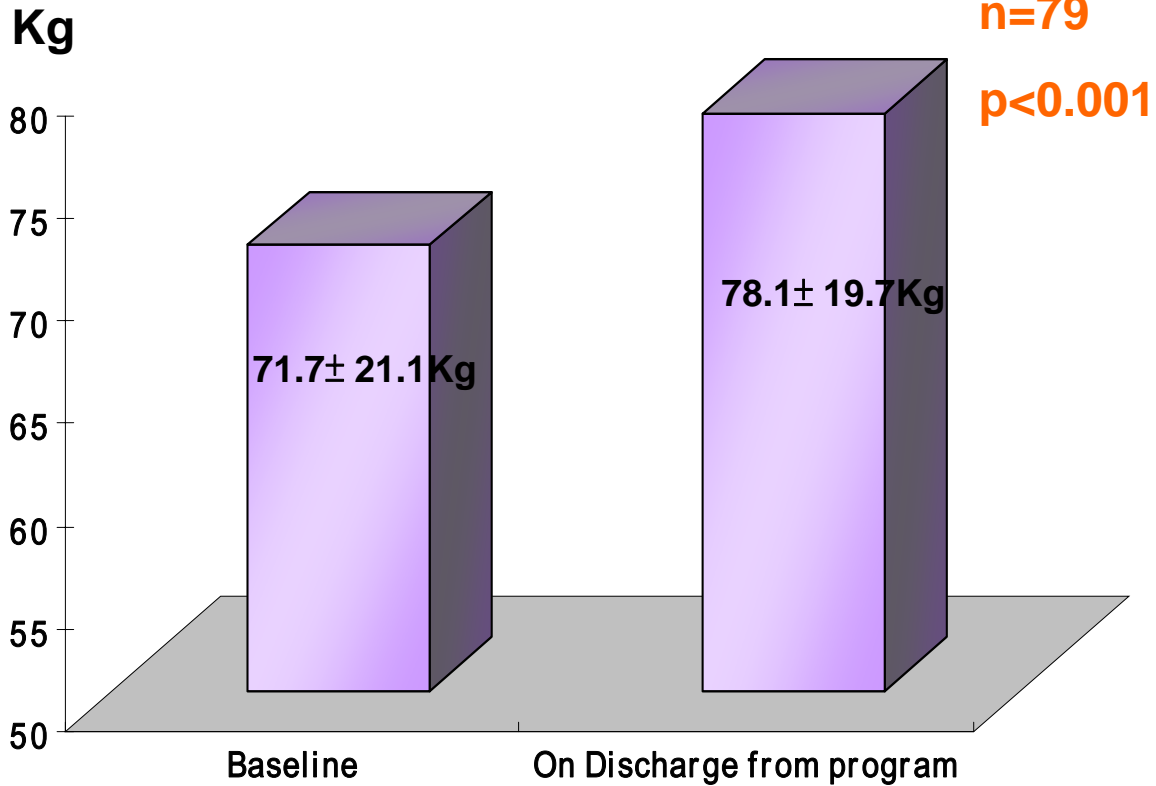
Significant Reduction in LDL-Cholesterol



Group 1

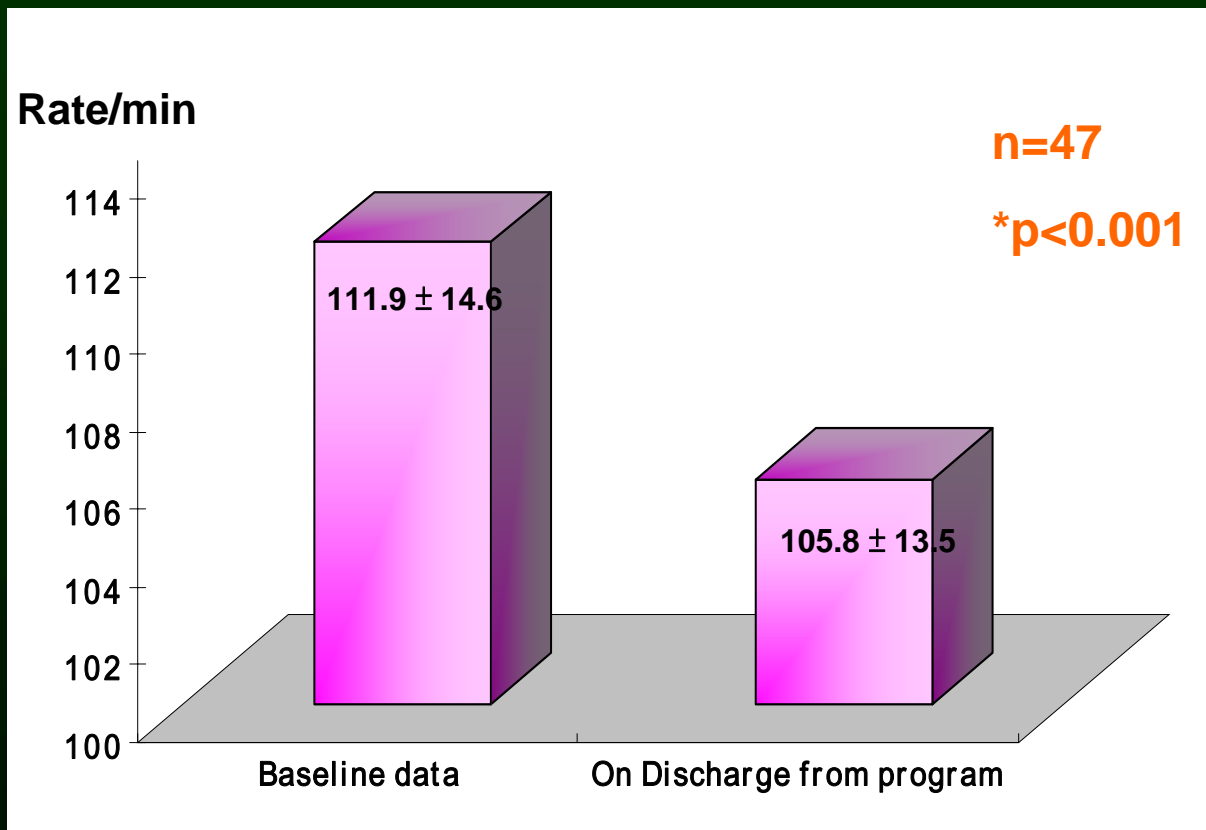
**Paired t-test, results vs baseline*
Gp 2 & 3 pts not showing significant improvement

Improvement in Hand Grip Strength



****Paired t-test, results vs baseline**

Improvement of Heart Rate in YMCA Step Test



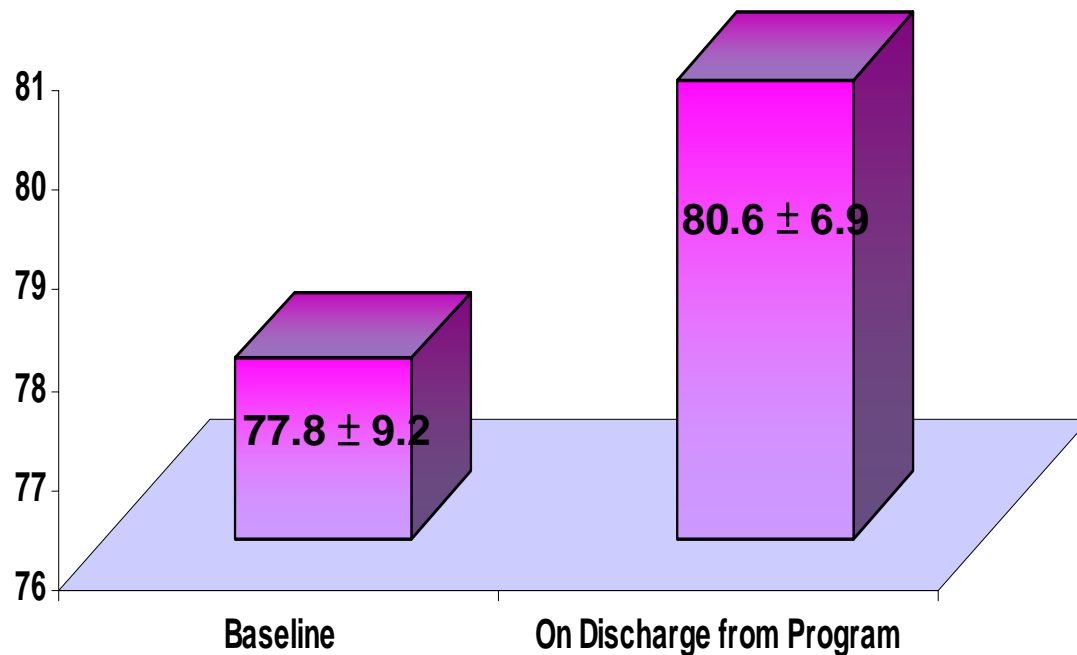
Young Men Christian Association (YMCA) Step Test

**Paired t-test, results vs baseline*

Significant improvement on Diabetes Empowerment Scale after the program

n= 127

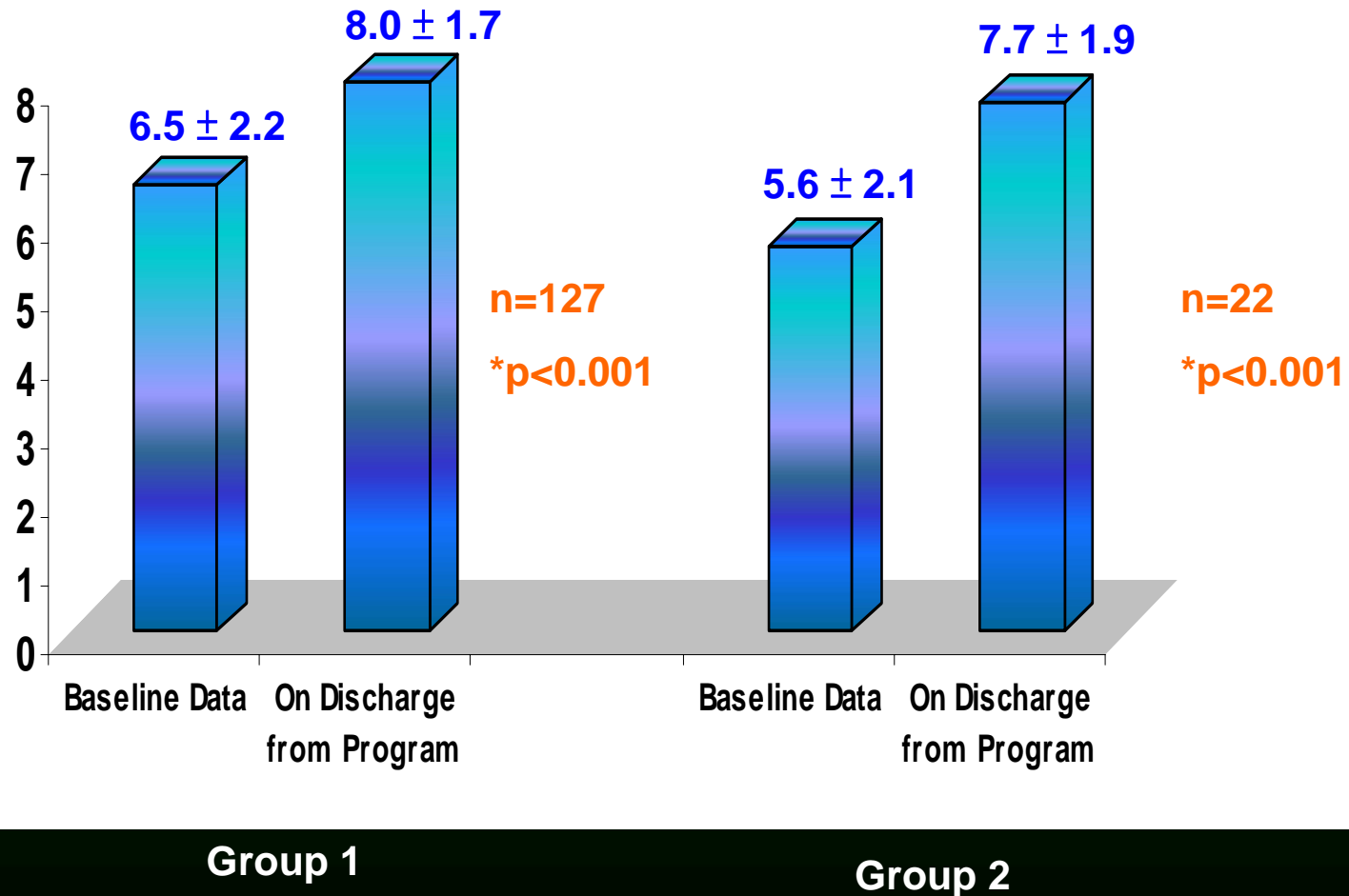
*p<0.001



Group 1

***paired t-test, results vs baseline
Gp 2 & 3 pts not showing significant
improvement**

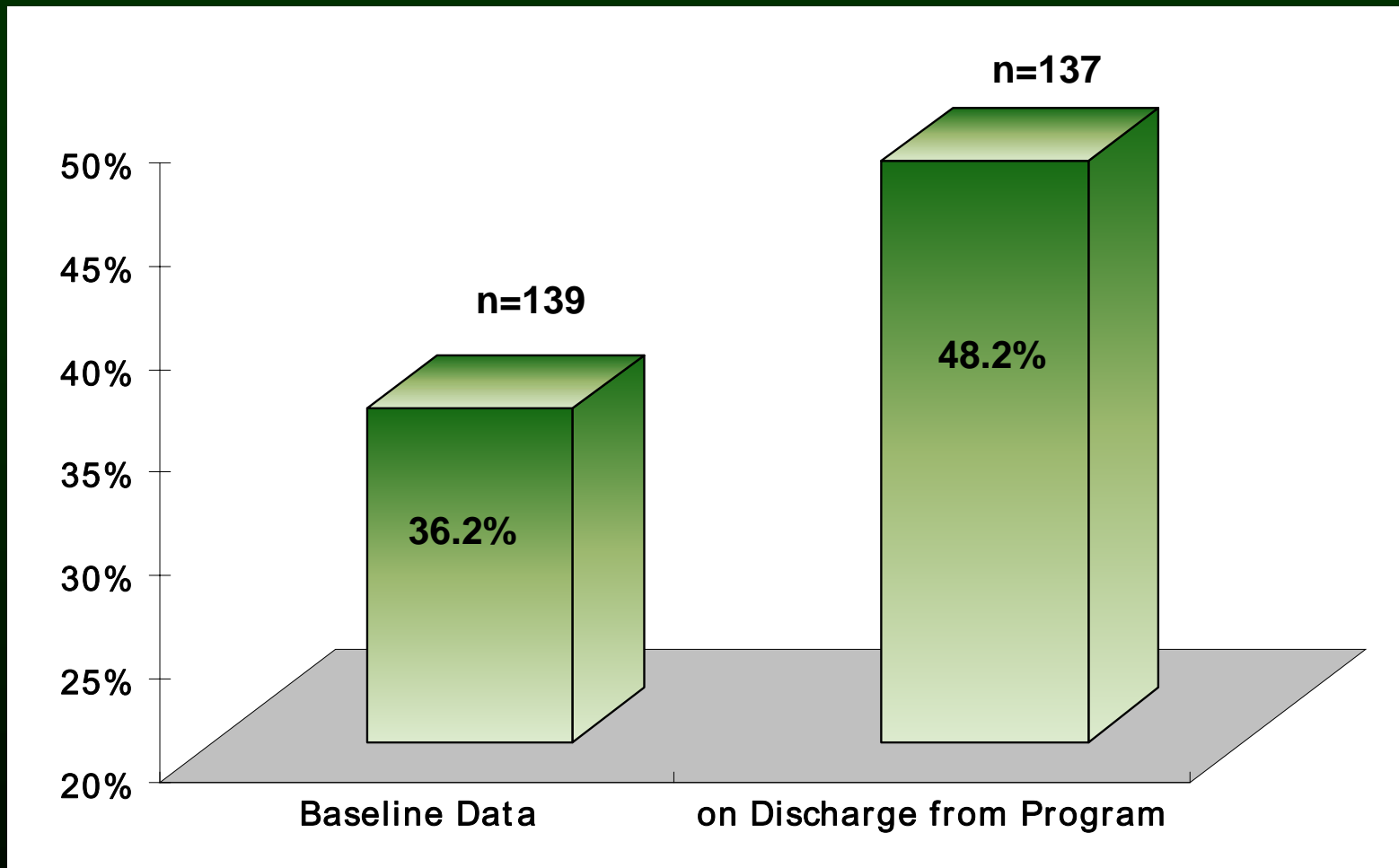
Significant improvement on Diabetes Knowledge Score after the program



*paired t-test, results vs baseline

Group 3 not showing significant improvement

Self-Blood Glucose Monitoring for patients on discharge from program



Group 1

****vs baseline, Chi square test, $p=0.03$
Gp 2 & 3 pts not showing significant
improvement**

Conclusions

- Enhanced diabetes disease management programme incorporating physiotherapist education:
 - Significant improvement on: mean HbA1c, Body fat composition, LDL-cholesterol, Hand grip strength, Heart rate in YMCA step test and SMBG,
 - Significant improvement on Chinese Diabetes Empowerment Scale for Group 1 patients and Diabetes Knowledge Score for Group 1 and Group 2 patients.

Team Composition

Team Leader

- **Dr. Andrew Ho, AC (M&G), TMH**

Team Members

- **Dr. Jun Liang, CON (FMed), TMH**
- **Dr. Laam Chan, MO (FMed), TMH**
- **Ng Sau Yee, APN, M&G, POH**
- **Chow Miu Fan, APN, M&G, POH**
- **Ng Hoi Fan, DM nurse, POH**
- **Hung Siu Chan, Veronica, APN, M&G, POH**
- **Ma Ka Man, Triage Nurse, ACC, TMH**
- **Law Yuen Tung, Physiotherapist, POH**
- **Ng Siu Ping, Physiotherapist, POH**
- **Mrs Sally Ng, CC (Diet), NTWC**
- **Joanne Koo, Dietitian, POH**
- **Vivian Chan, DOM, NSD, TMH**
- **Tang Pui Fun, APN, NSD, NTWC**
- **All SOPD nurses in POH**

Thank You

Discussions

- Limitations
 - Small sample size
 - Non-randomized patient selection
- Positive outcomes due to
 - Role of physiotherapist vs. patient motivation
 - Actual exposure and experience on exercise
- Evidence of exercise on overweight diabetics strong
 - Role of physiotherapist requires further study

DM nurse / Dietetic education class

DM nurse class

- ◆ General DM knowledge, signs & symptoms and DM complications
- ◆ DM treatment principles and ideal target controls
- ◆ Commonly used oral anti-diabetic drugs (OAD) (actions, S/E & special precautions)
- ◆ Basic survival skills
- ◆ “Sick Day” Management
- ◆ Demonstration on use of blood glucose meter and Histix charting
- ◆ Individual assessment (checking BP/P, BW and Histix) & goal setting
- ◆ Give DM educational booklet and Reminder card

Dietetic class

- ◆ Diet assessment, estimation of current calorie, CHO, fat, protein intake
- ◆ Setting of individual goal – estimation of energy requirement, devise diet plan with energy level
- ◆ Education talk on DM special diet:
 - Suitable choice & portion size of cereals, fruits, and milk, protein foods and fats;
 - Attitude towards refined & unrefined carbohydrate,
 - Glycaemic index;
 - CHO counting and food exchange system
 - Food labelling
 - Meal time arrangement; guidelines for eating out, alcohol consumption
- ◆ Cooking demonstration
- ◆ Give DM diet handbook with meal plan



Physiotherapist Class

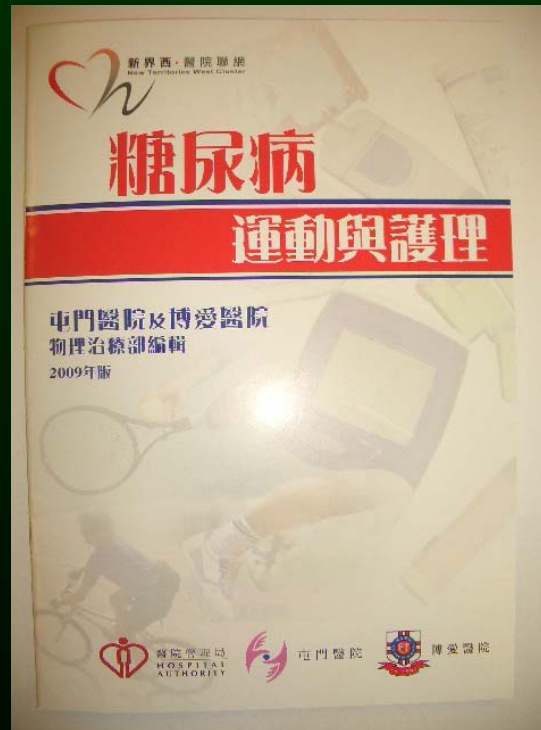
Exercise Education (20 mins)

- ◆ Benefits of exercise to DM pts
- ◆ Modes of Ex (warm up, aerobic, resistance & cool down)
- ◆ Recommended exercise frequency, intensity & duration
- ◆ Exercise precaution
- ◆ How to prevent hypo / hyperglycaemia during & after exercise
- ◆ Recommendations for pts with other Cxs (e.g. retinopathy, peripheral neuropathy)



Goal Setting (10 mins)

- ◆ Setting, sharing & discussion of goal setting
- ◆ Introduce & explain usage of exercise logbook



Guidance on Physical Training Equipments (45 mins)

- ◆ Exercise Demonstration and Practice

