# Measuring the Effect of an Inpatient Amputee Rehabilitation Program on the Control of Diabetes Mellitus

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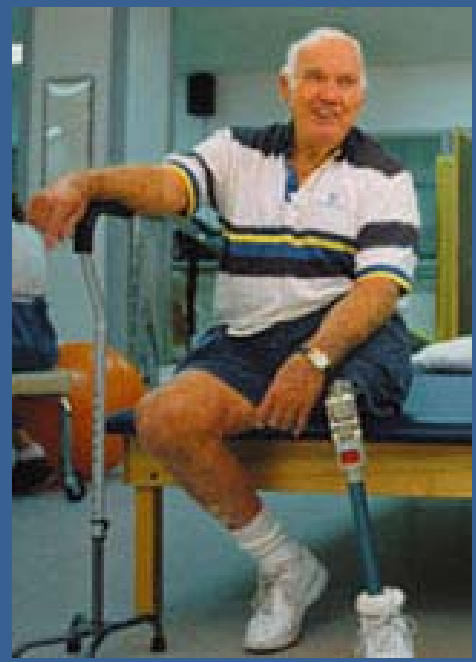
# Introduction

- Noticed a reduction in insulin dosing during in-patient amputee rehabilitation
- Literature search showed that insulin requirements decreased with increased activity in the diabetic population
- No research done specifically with amputee population



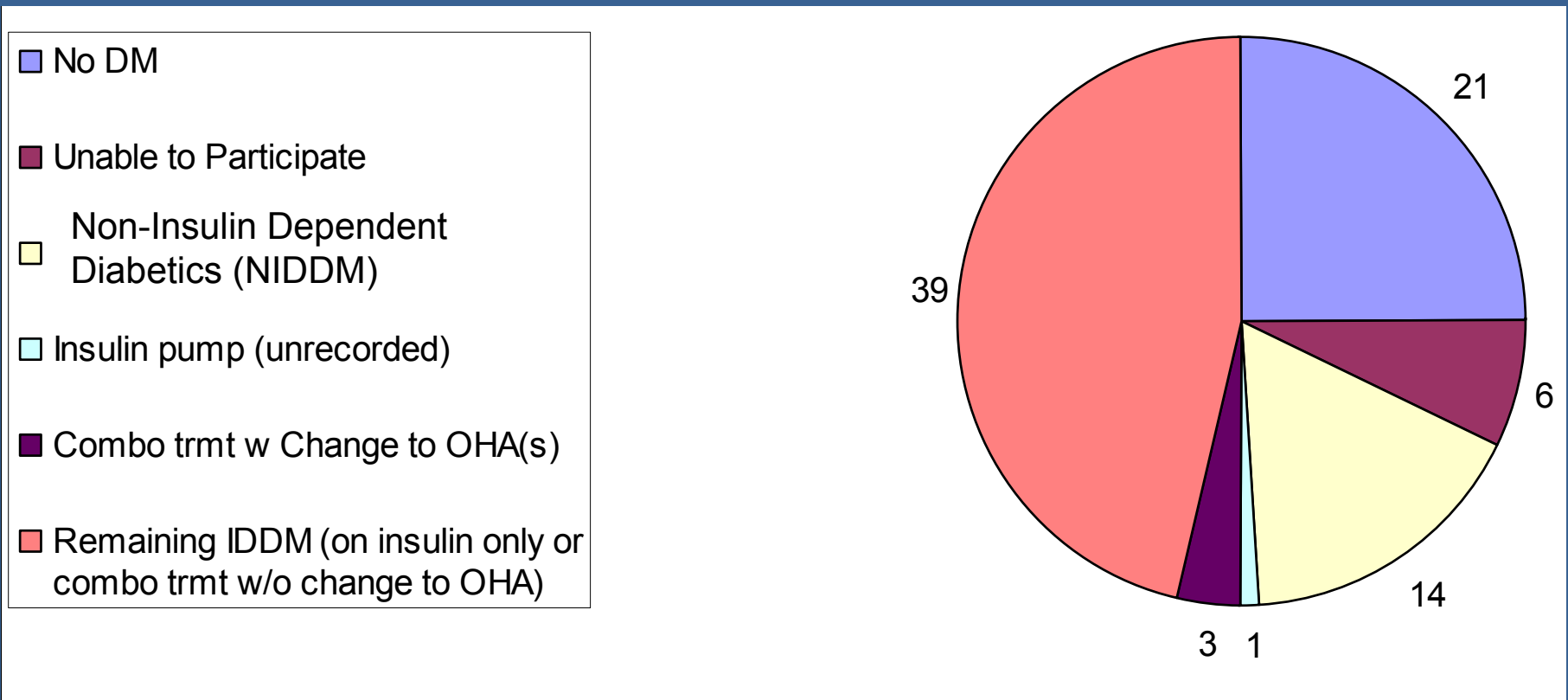
# Hypothesis

A significant reduction occurs in the total daily insulin requirement of the IDDM inpatient participating in amputee rehabilitation.

# Method

- Retrospective chart review
- 84 charts of the patients admitted to the Chedoke Amputee Rehabilitation program in the year 2008 were reviewed
- 39 patients were included in the sample population after exclusion criteria were applied

# Exclusions


No DM
Unable to Participate
Non-Insulin Dependent Diabetics (NIDDM)
Insulin pump (unrecorded)
Combo trmt w Change to OHA(s)
Remaining IDDM (on insulin only or combo trmt w/o change to OHA)
21
6
14
1
3
39

# Method

- Variables collected:
  - age
  - gender
  - level of amputation
  - length of stay
  - discharge mobility status
  - body weight
  - fasting blood glucose
  - HbA1c
  - total daily insulin

# Statistical Analysis

- Daily requirements of insulin at admission were compared to those at discharge using a paired t-test

- Pearson's tests were used to uncover correlations between various variables including the difference in insulin, age, HbA1c and body weight

- ANOVA tests were used to look for correlations between the difference in insulin and the level of discharge mobility, as well as the correlation between insulin and gender

# Population Characteristics

- Men outnumbered women almost 3:1 (10F, 29M)
- Average age: 59yo (range 29 – 85, median 62)
- Mostly unilateral transtibial level (2 Bilat TTs & 3 Symes)
- Average LOS: 5.7wks (range 2 – 8.5, median 6)

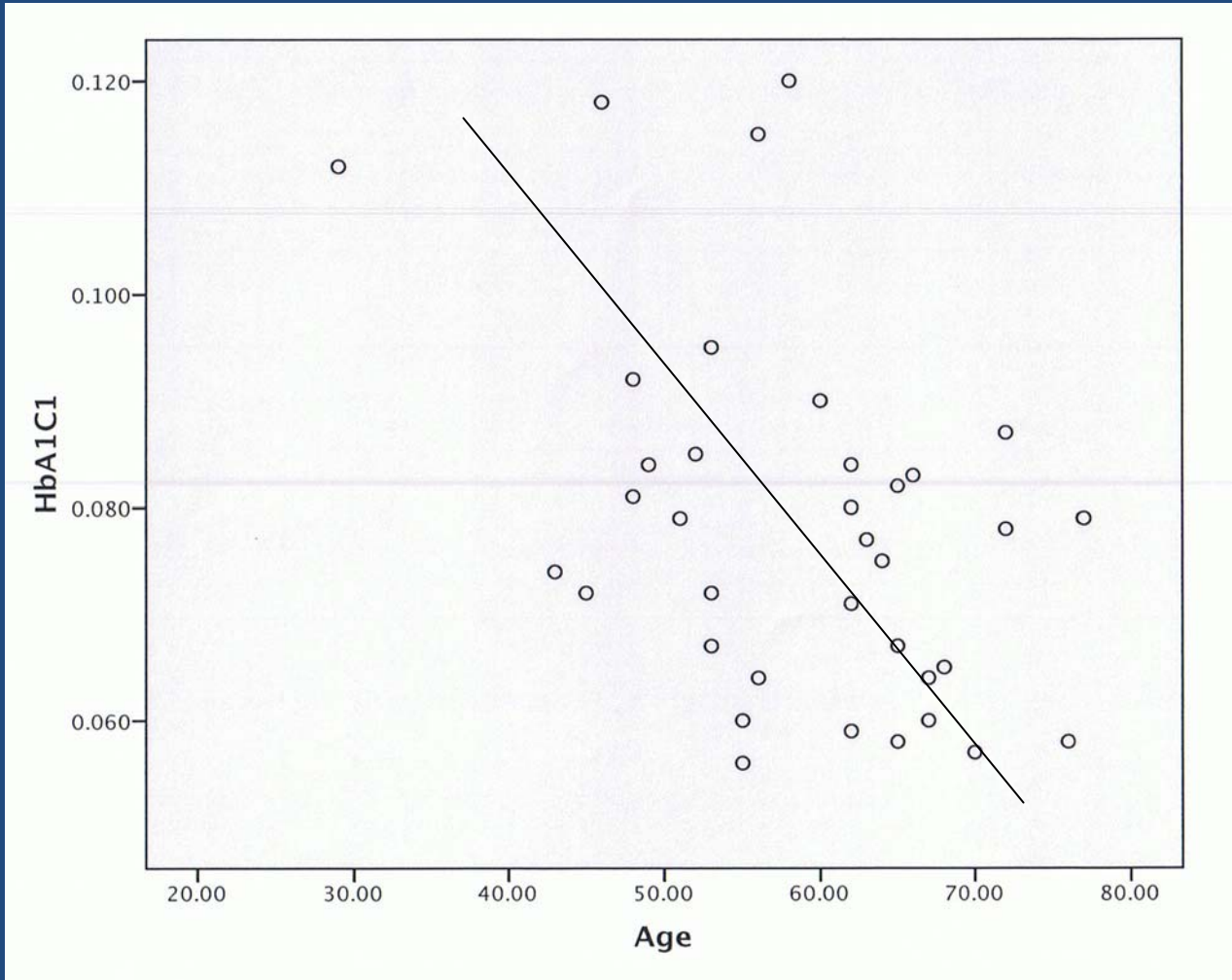
# Admission vs. Discharge Insulin

| Variable | ADM | D/C | Mean Diff (SD) | p* |
|---|---|---|---|---|
| Mean insulin dose (U/d) | 52.28 | 49.18 | 3.10 (12.96) | 0.072 |

# Correlations between Insulin Diff, Age, HbA1c & Wt

| | Insulin Dec. (U/d) | Age (yrs) | HbA1c (mmol/L) | Body Wt (kg) |
|---|---|---|---|---|
| Insulin Dec (U/d) | --- | 0.786 | 0.004 | 0.148 |
| Age (yrs) | 0.786 | --- | 0.009 | 0.595 |
| HbA1c (mmol/L) | 0.004 | 0.009 | --- | 0.703 |
| Body Wt (kg) | 0.148 | 0.595 | 0.703 | --- |

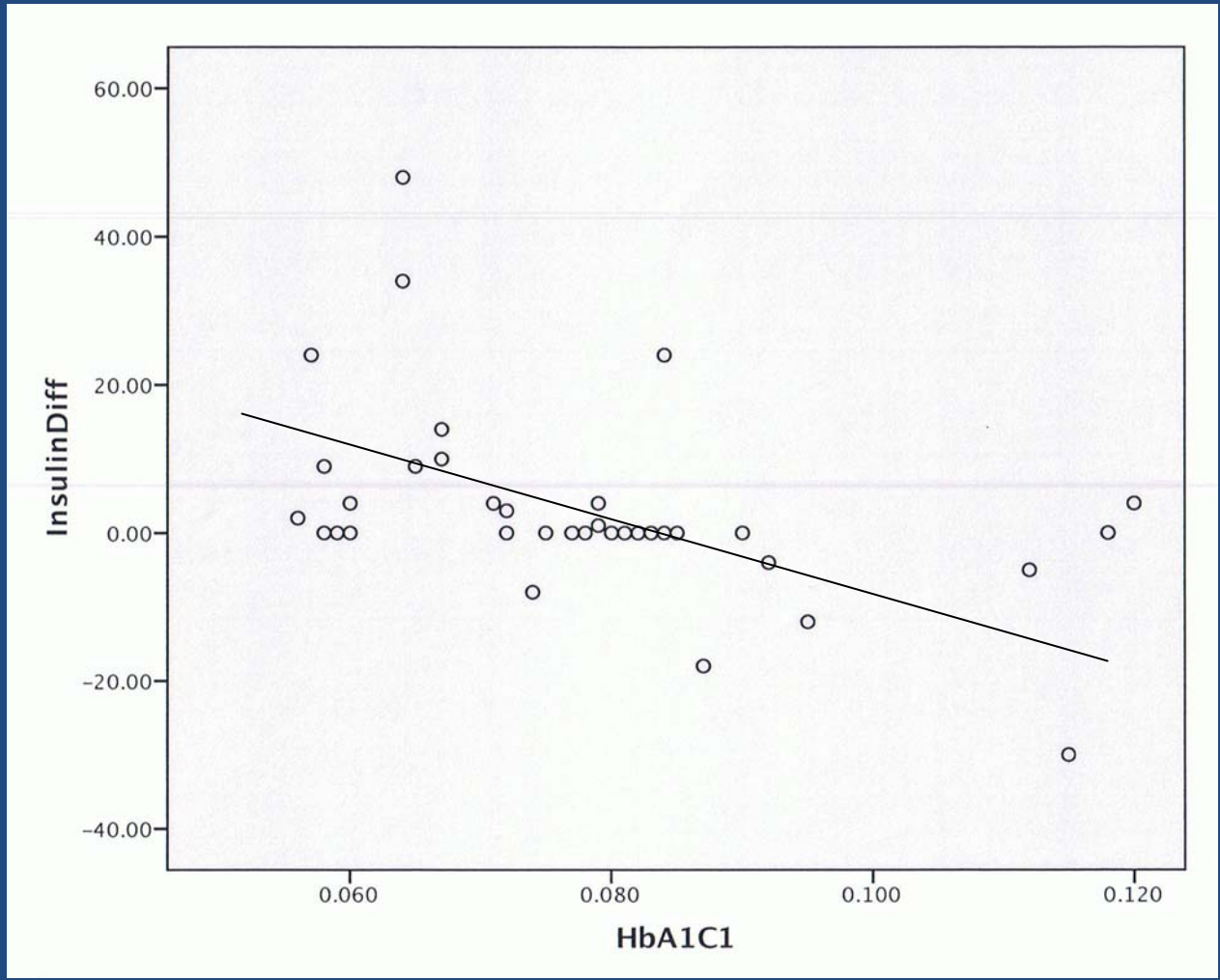
# Age vs HbA1c*




Correlational (Pearson's test) p value of 0.009.

*HbA1c value at admission (N=36)

# Insulin Difference vs HbA1c*




Correlational (Pearson's test) p value of 0.004.

*HbA1c value at admission (N=36)

# Discharge Mobility Status vs Insulin Requirement

| Mobility Categories | N | Mean Insulin Difference (SD) | p* |
|---|---|---|---|
| W/o aid or occas cane | 7 | 5.29 (9.21) | 0.902 |
| One to two canes | 19 | 2.05 (12.80) | |
| Rollator / Walker | 7 | 1.71 (5.91) | |
| Supervision / Transfers | 6 | 5.50 (22.85) | |

* Determined by ANOVA test

# Gender vs Insulin Requirements

| | N | Mean | Std. Dev. | p* |
|---|---|---|---|---|
| Male | 29 | 4.80 | 11.52 | 0.637 |
| Female | 10 | 2.52 | 13.56 | |

# Discussion

- No preadmission insulin values to know how controlled they were prior to admission. We did have HbA1c levels on admission.
- Self medication recording by patients
- Although on diabetic diet, no control over snacking while in program
- Skin breakdown was recorded in charts but not collected in this study

# Summary

- A statistically significant tendency for IDDM amputee rehabilitation inpatients to require less insulin with participation in the program was not shown by this retrospective chart review although 82% of our sample either had no change or a decreased need for insulin

- The p value of 0.072, came close to the significance level of 0.05, suggesting that a larger sample size would be required

- Also revealed by this study was that more complete records on measures of diabetes management in this patient population are needed.

# Future Work

- Assess fasting lipid profiles to determine if there is a correlation with insulin requirements or if there is any improvements in lipid profiles with an increase in level of activity
- Document admission and discharge height and weight for purposes of measuring BMI
- Use 2 minute walk test as an indicator for activity
- Prospective study

# References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Hamilton

# New Rehab Building

Front Entrance (West Elevation)

Wheeling Track (East Elevation)