

# DAFNE

(Dose Adjustment For Normal Eating)

## Promoting the Expert Patient

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# DAFNE and OzDAFNE



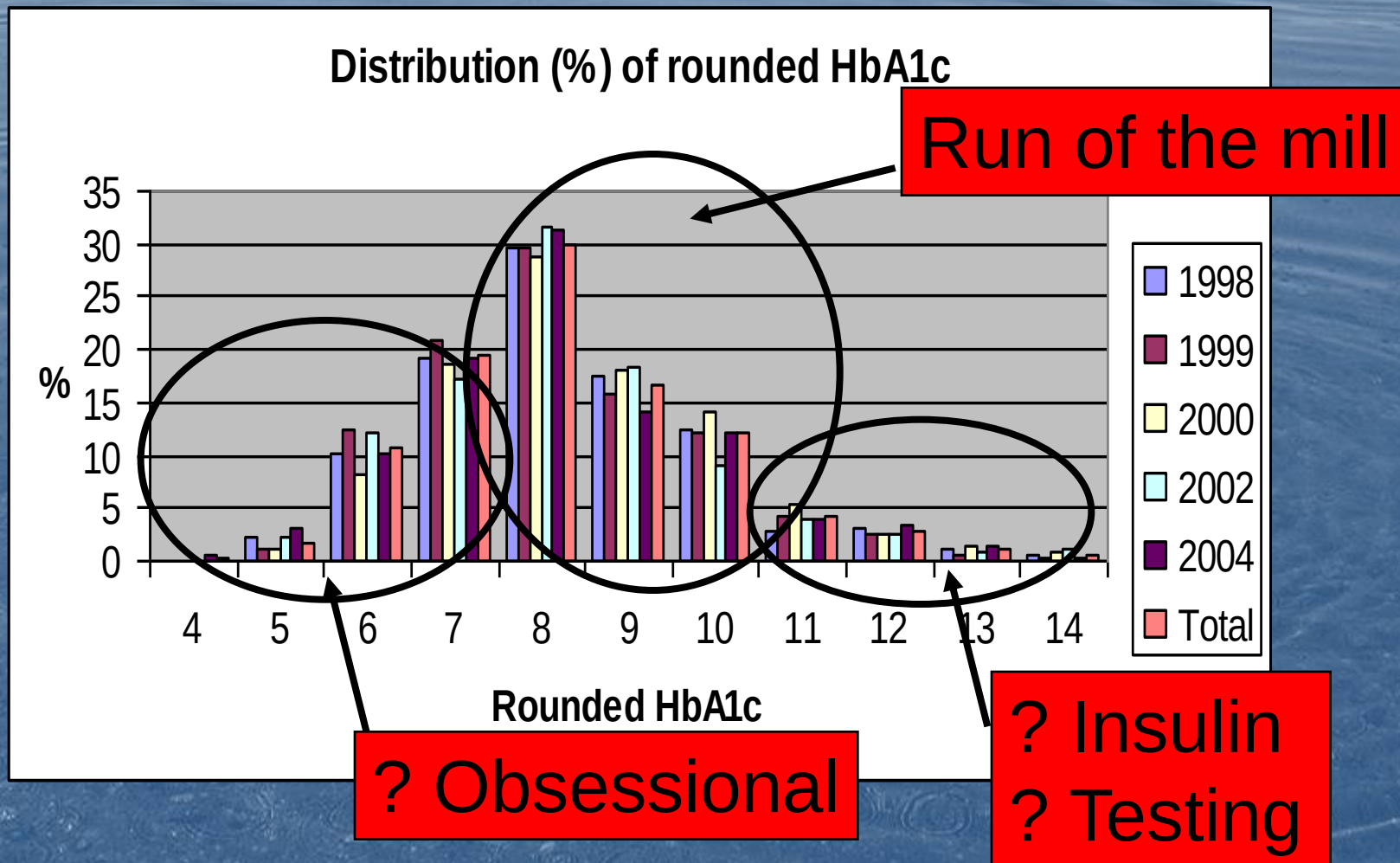
**EAT  
WHAT  
YOU  
LIKE**



# Outline

- Context of intensive insulin therapy for Type 1 DM
- Description of DAFNE program
- DCCT vs. DAFNE
- DAFNE outcomes in Australia
- DAFNE expert patients?
- Considerations for DAFNE implementation

# ANDIAB HbA1c results in T1DM Australian specialist practice

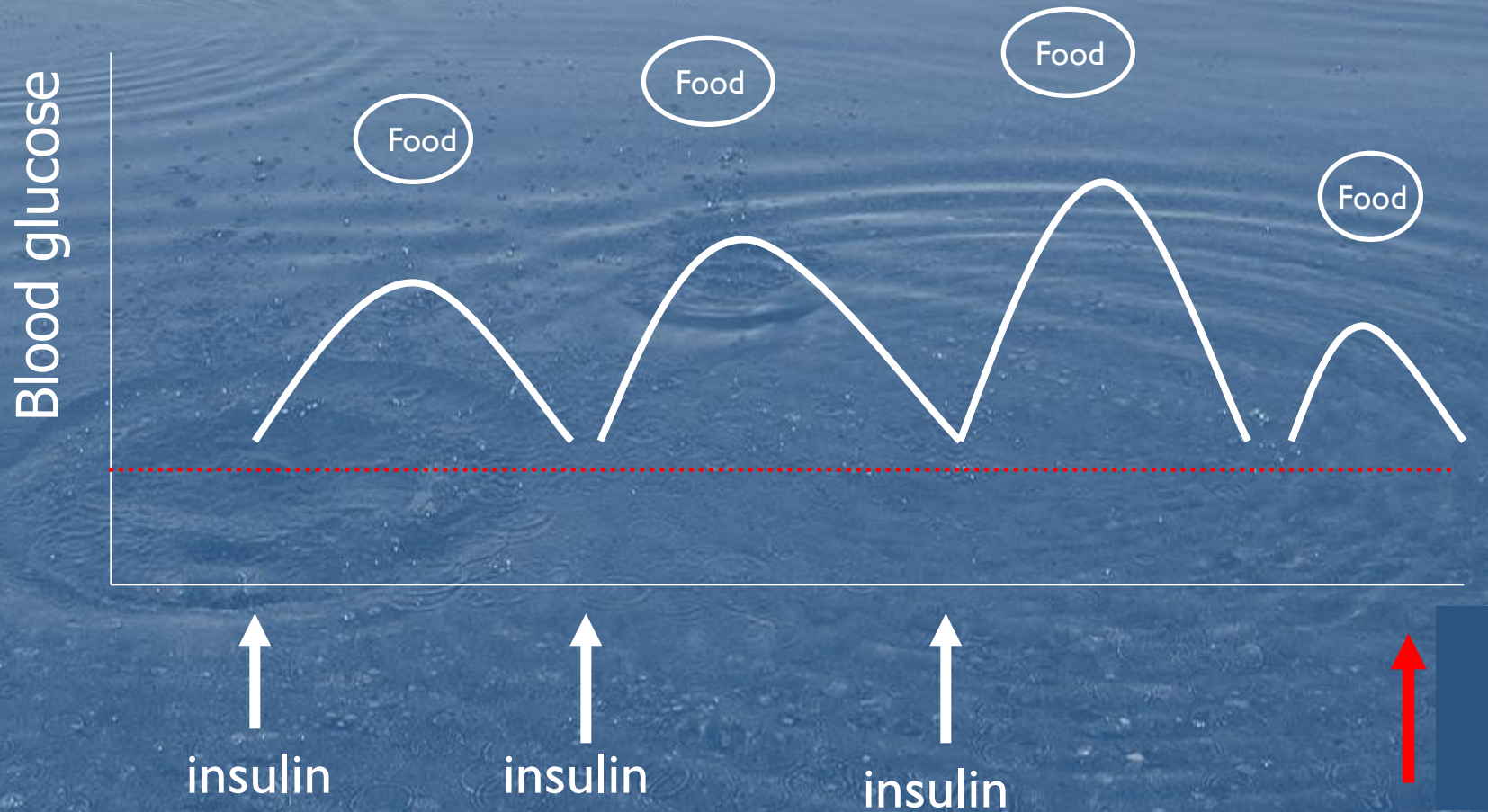




# Insulin therapy in Type 1 DM

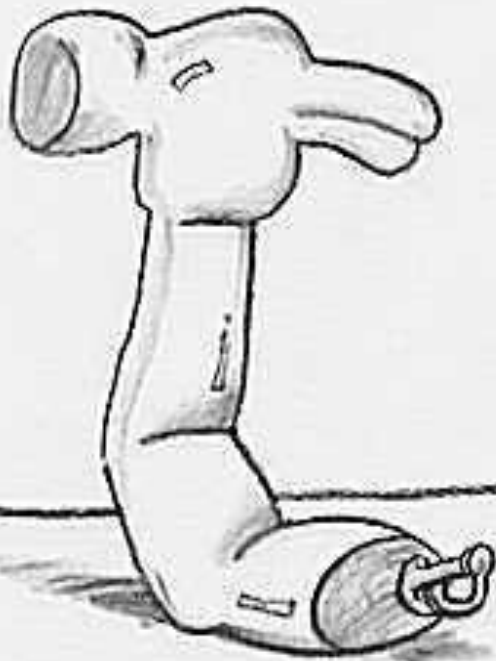
- Insulin replacement rather than insulin supplementation (as in T2DM)
- Higher insulin sensitivity
- Higher risk of hypoglycemia if excess insulin or reduced carbohydrate intake

# Common 4 injection treatment





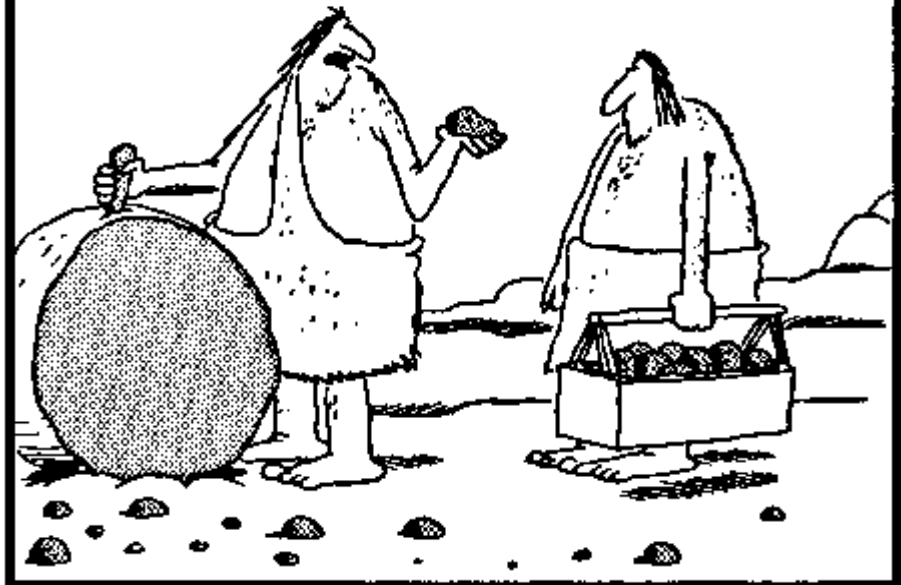
## COMPLETELY USELESS TOOLS



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## The Inflatable Hammer

## Know your Tools



"So what's this? I asked for a *hammer*!  
A hammer! *This* is a crescent wrench! ...  
Well, maybe it's a hammer. ... Damn these stone  
tools."

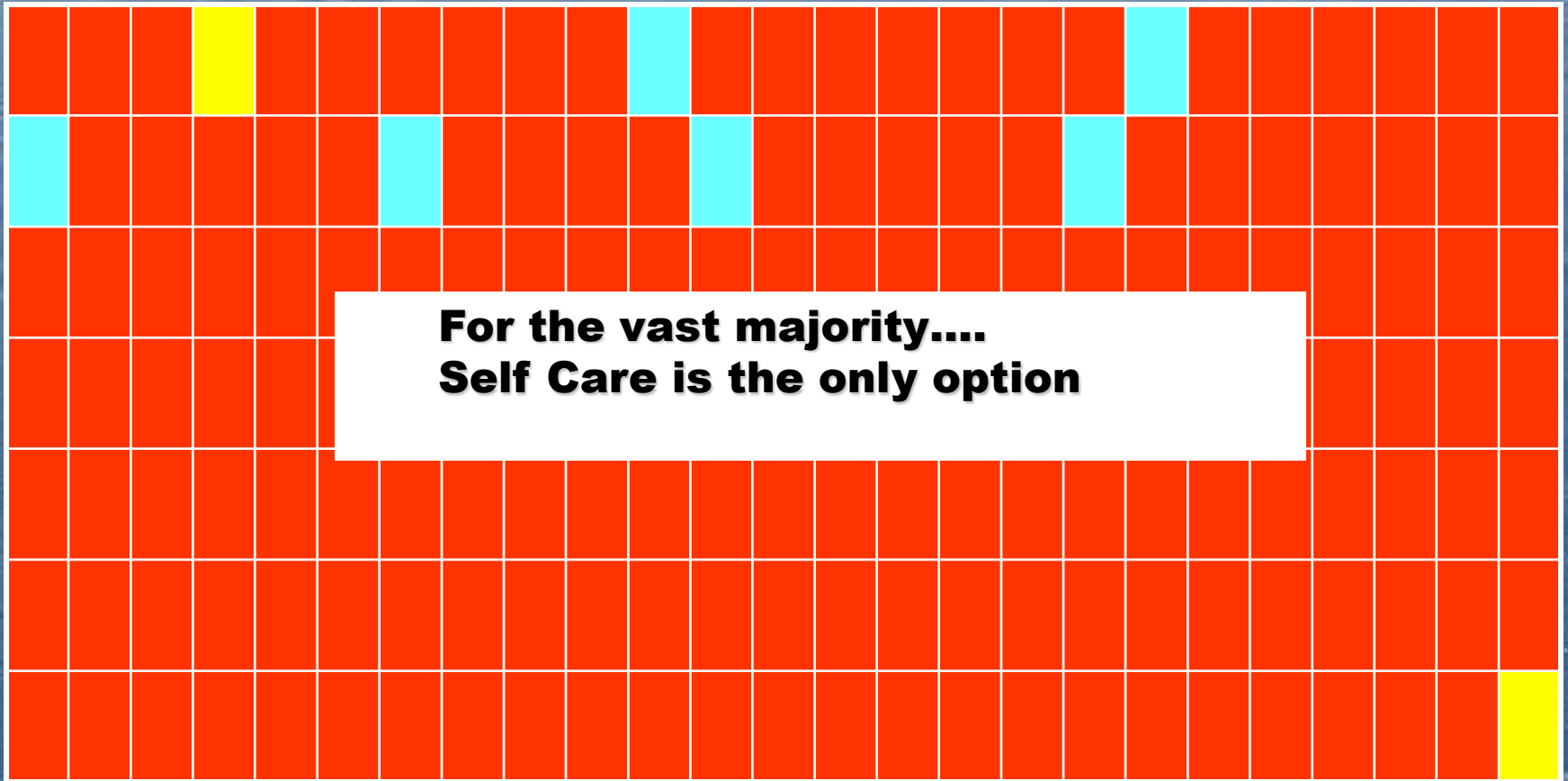
Clinic

Life

# Life with Diabetes

~ 6 months

Telephone





# DAFNE's Grandfather



- Professor Karl Stolte (1881-1951)
- Professor of Paediatrics, Rostock, Germany
- 1929 "Needs-adjusted Insulin Therapy along with Free Nutrition"

# DAFNE's Father



- Professor Michael Berger (1944 – 2002)
- Düsseldorf – training site for the initial UK DAFNE centres
- Five day inpatient programme for intensive Type 1 diabetes care



# What is DAFNE

## Basic outline

- **For Type 1 diabetes**
  - **Outpatient group programme (6-8 people) for 5 full days**
  - **Group knowledge important**
  - **Free “normal” diet**
  - **Fit insulin to diet, not vice versa**

# Inclusion criteria

## DAFNE

- Type 1 diabetes
- Age > 17 years
- HbA1c < 12%
- Willing to inject and test at least four times daily
- Able to participate in group sessions
- Basic mathematical skills



# DAFNE insulin and testing

## ■ Basal insulin

- Simple basal insulin (start  $\sim 1$  unit / hr), commonly twice daily
- Monitoring  $\sim 4x$  / day (pre meals)
- No post meal testing

(Many people test 6 – 7 times per day and “panic” with each “bad” reading)

# DAFNE insulin doses

## ■ Mealtimes

- Carb estimation (10g “CPs” or carbohydrate portions)
- Meal insulin / CHO intake (CPs)
  - Not “8 units for breakfast” but rather “1 unit per CP”
- Corrections for both ↓ and ↑ BGLs  
Set targets and use these to adjust



# DAFNE –further characteristics

- **Emphasis on building confidence & independence**
- **Inpatient based in Germany, outpatient based in UK and Australia**
- **Quality assurance and peer review are inbuilt**
- **All units contribute follow up data**

# The DAFNE program...

- **Education is by core curriculum**, however educator can offer own choice of teaching style
- **Skills based program** only – psychological support from the group is incidental
- **Practical group work** and interaction is the key to meeting learning objectives
- Core focus on **recording and interpreting BGL readings** and **applying problem solving skills** to insulin dose adjustments.





Handwritten notes on the top sheet of the flipchart, written in red ink:

- Handwritten notes on the top sheet of the flipchart, written in red ink:

Handwritten notes on the middle sheet of the flipchart, written in black ink:

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16 11 2004

# DIABETES EDUCATION PROGRAMME

| MONDAY                                                     | TUESDAY                                                           | WEDNESDAY                                                   | THURSDAY                                                                           | FRIDAY                                                            |
|------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>9:15 – 11:00 am</b><br>Introduction<br>What is Diabetes | <b>9:00 – 10:00 am</b><br>Discuss individual blood glucose levels | <b>9:00 – 11:00 am</b><br>Discussion and Insulin adaptation | <b>9:00 – 10:00 am</b><br>Discuss individual blood glucose levels                  | <b>9:00 – 10:00 am</b><br>Discuss individual blood glucose levels |
| <b>11:30 – 12:30pm</b><br>Nutrition                        | <b>10:30 – 12:30 pm</b><br>Nutrition                              | <b>11:30 – 12:30 pm</b><br>Hypoglycaemia 2                  | <b>10:15 – 11:30 pm</b><br>Exercise 1<br><br><b>11:30 – 12:30 pm</b><br>Exercise 2 | <b>10:30 – 12:30 pm</b><br>Eating out<br>Alcohol                  |

## LUNCH 12:30 – 1.30pm

### Discuss individual blood glucose levels

|                                                                                                                                      |                                                                                              |                                                         |                                                                           |                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>1.30 – 2:45pm</b><br>Metabolic Self Monitoring <ul style="list-style-type: none"> <li>▪ Blood glucose</li> <li>▪ HbA1c</li> </ul> | <b>1:30 – 2.45 pm</b><br>Insulin injection technique<br>Insulin action<br>Insulin strategies | <b>1:30 – 2:30 pm</b><br>Discussion with the Doctor     | <b>1:30 – 2:30 pm</b><br>Annual Review Discussion<br>Eyes<br>Kidneys      | <b>1:30 – 2:30 pm</b><br>Nutrition Quiz<br>Healthy eating              |
| <b>3:00m – 4:00pm</b><br>Definition of individual goals                                                                              | <b>3:00 – 4:00 pm</b><br>Hypoglycaemia 1                                                     | <b>2:45 – 4:00 pm</b><br>Sick day rules<br>Ketoacidosis | <b>2:45 – 4:00pm</b><br>Annual review discussion<br>Feet<br>Annual Screen | <b>2:45 – 4:00 pm</b><br>Contraception and pregnancy<br>Social aspects |

## DISCUSSION 4:00 – 5:00 pm





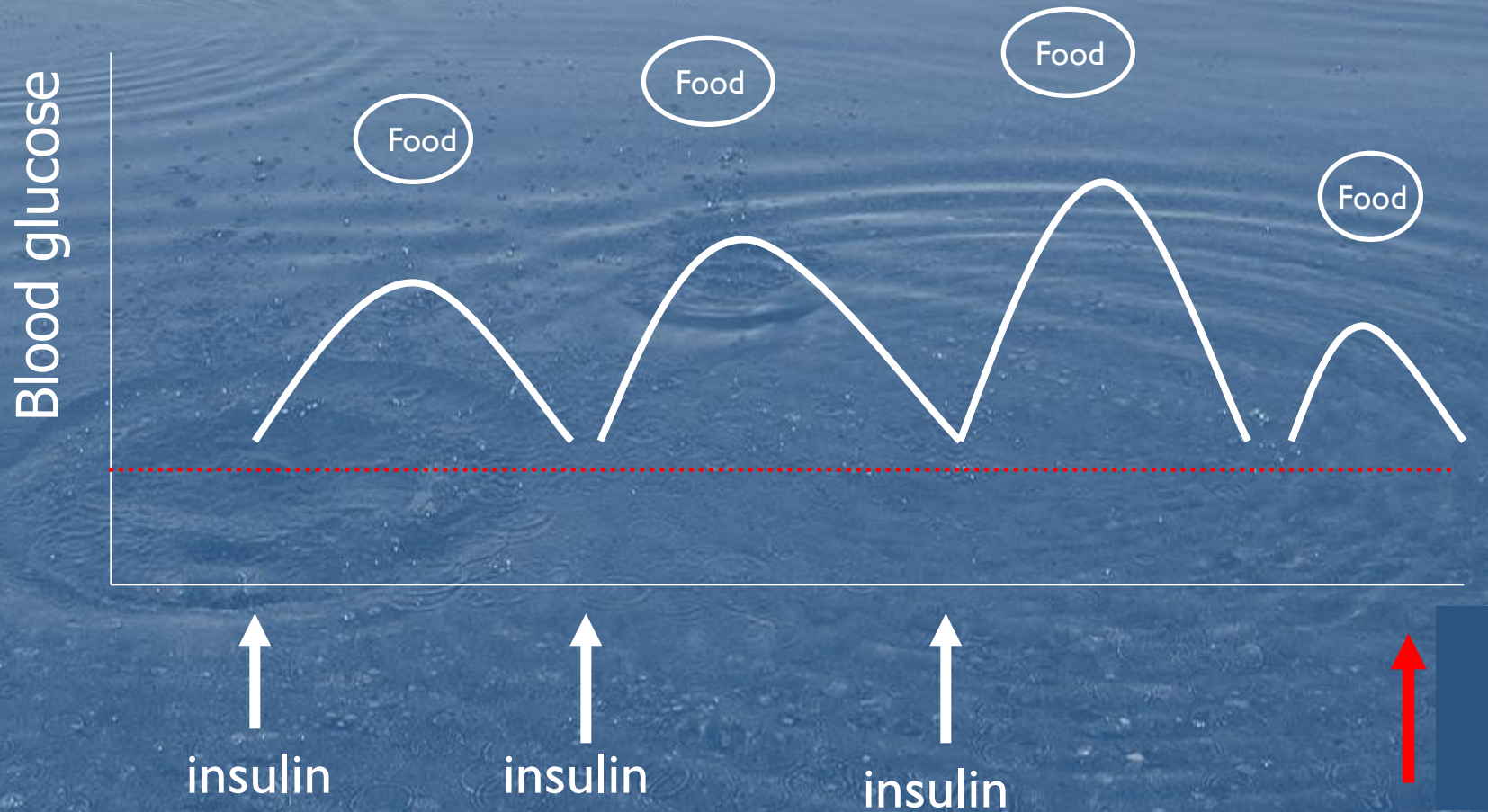
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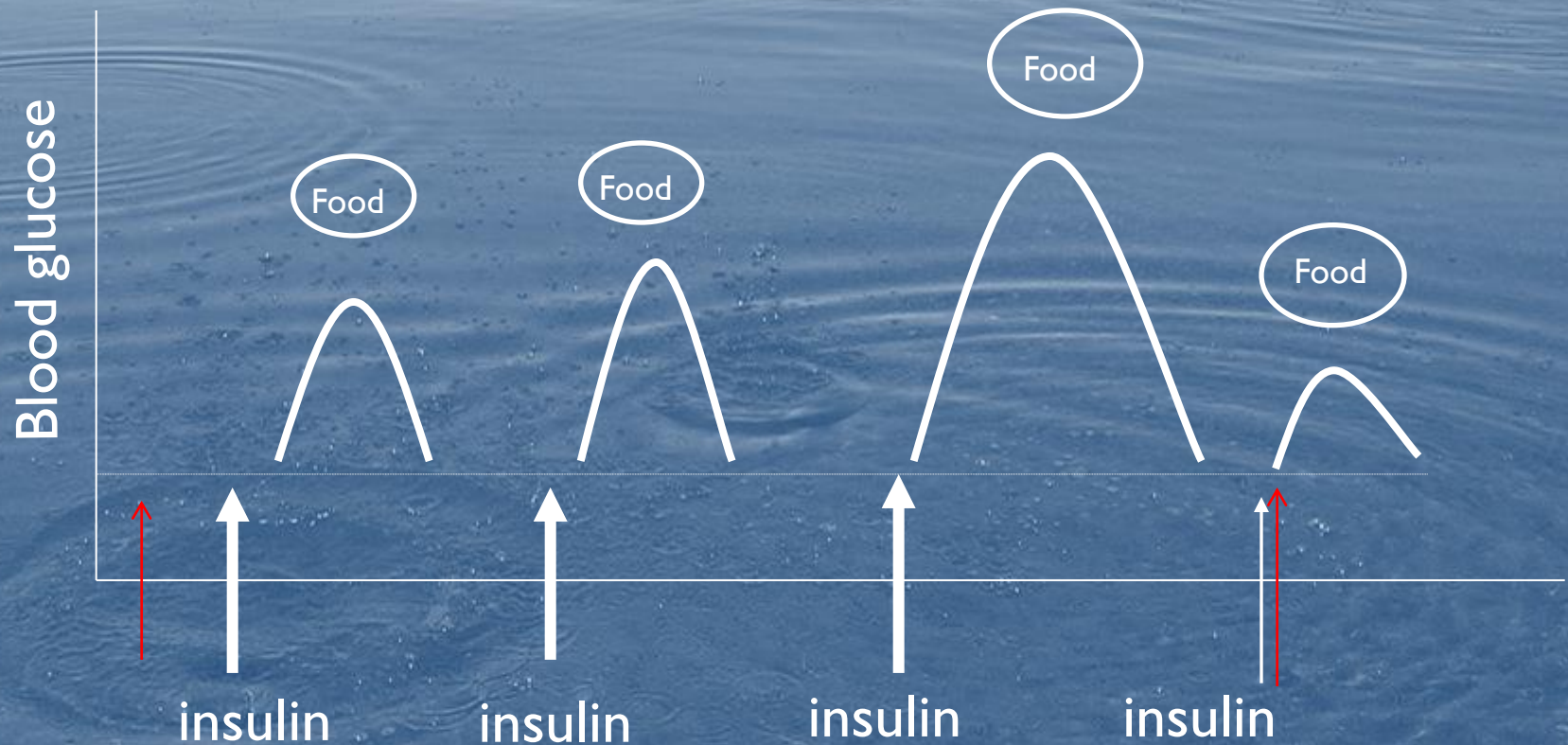


# Common 4 injection treatment

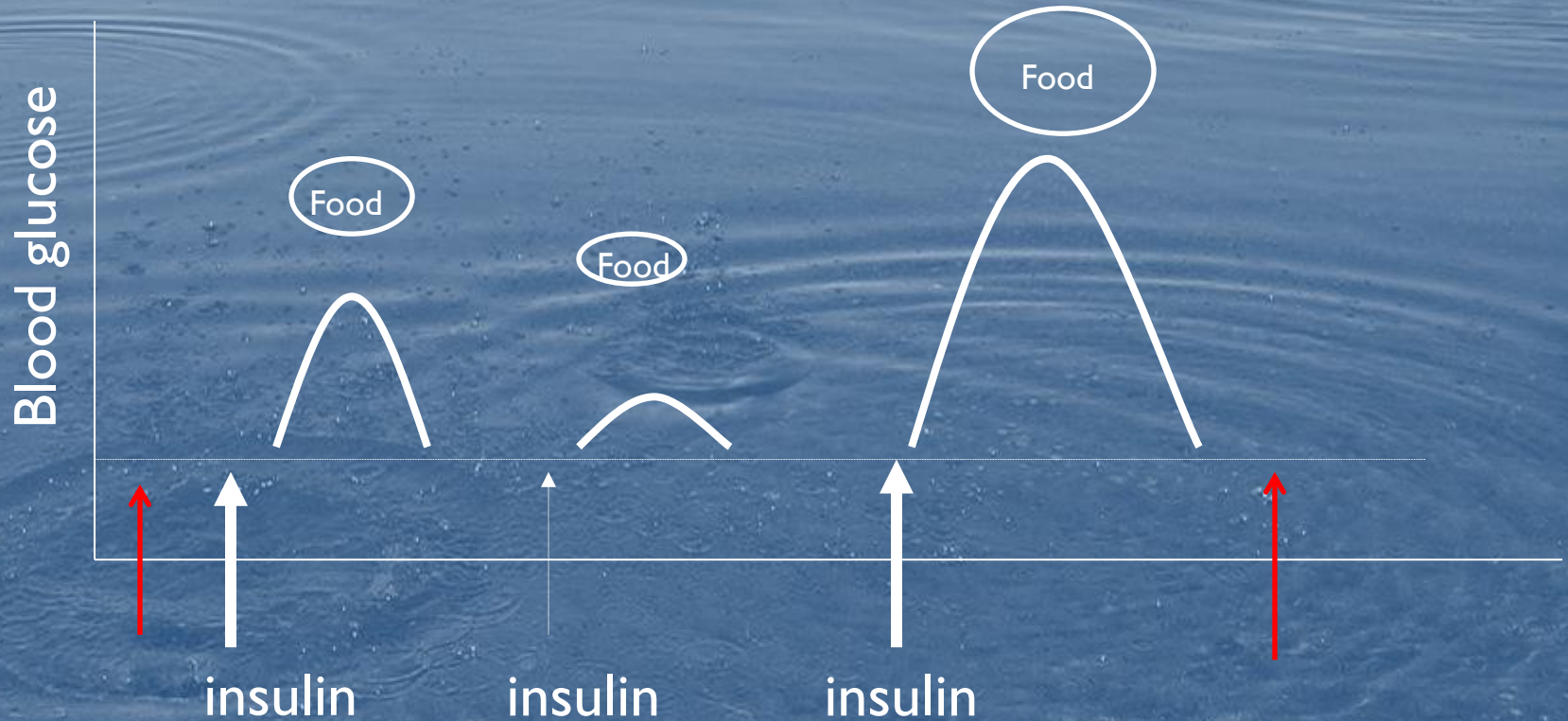




# The DAFNE approach - food first



# The DAFNE approach - want to eat less?





# Intensive glucose control in T1DM

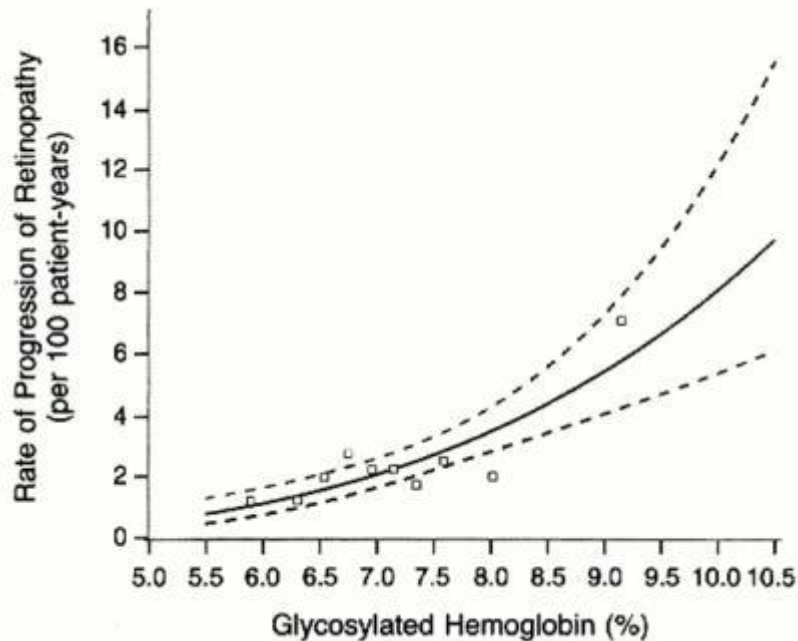
?Inevitable complications?

- Landmark DCCT Study (NEJM 1993)
  - Benefit from intensive glucose control (reduced microvascular disease)
  - Complications from intensive glucose control
    - Increased hypoglycemia (including severe events)
    - Weight gain
  - Marked variation between centres in incidence of severe hypoglycemia

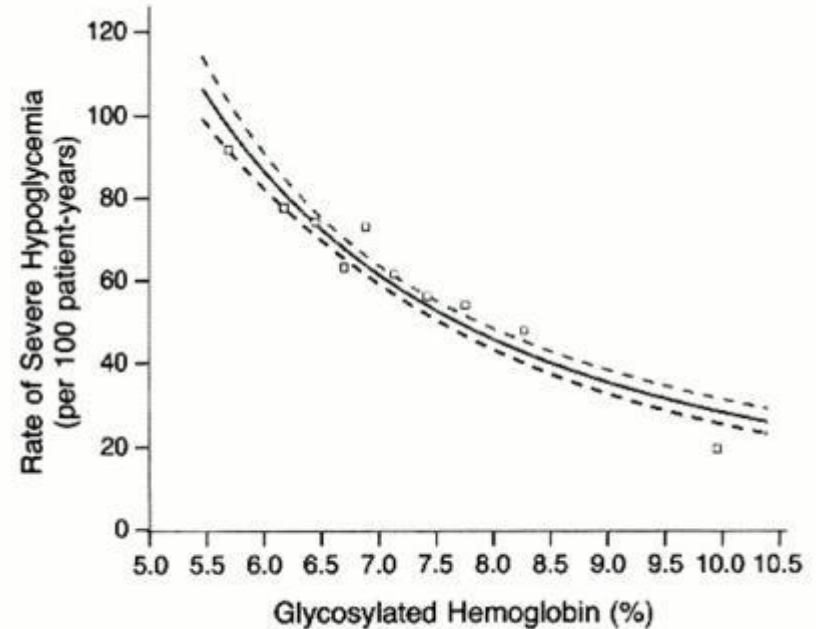
# ↓HbA1c Without ↑Hypos??

Retinopathy

Hypoglycaemia



A



B



# DAFNE vs DCCT

## ■ DAFNE

- “Free” diet
- Insulin to fit CHO
- 5 day outpatient (UK)
- No extra telephone contact
- Patient directed
- Clinic every 3-4 months

## ■ DCCT

- Meal regularity
- CHO consistency
- 2-4 day inpatient
- Weekly telephone contact
- Medically directed
- Monthly visits
- CSII (Insulin pump therapy) ~ 40%

# DAFNE vs DCCT

## ■ DAFNE Targets

### ■ BGLs

5.5 – 7.7 mM pre breakfast

4.5 – 7.7 mM pre meals

6.5 – 8.0 mM at bedtime

### ■ HbA1c 6.0 – 7.0%

## ■ DCCT Targets

### ■ BGLs

3.9 – 6.7 mM pre meals

< 10 mM post meals

> 3.6 mM at 3:00 am

### ■ HbA1c < 6.05%



# DAFNE vs DCCT

## ■ DAFNE Outcomes

- HbA1c ↓ 0.9% (UK)
- HbA1c ↓ 1.2% (Austria)
- Hypos ↔ (UK)
- Hypos ↓ 66% (Austria)

## ■ DCCT Outcomes

- HbA1c
  - Conventional ↔
  - Intensive ↓ 2%
  - CSII ↓ 2.3%
- Hypos ↑ 300% (variable across centres)

# DAFNE and Outcomes

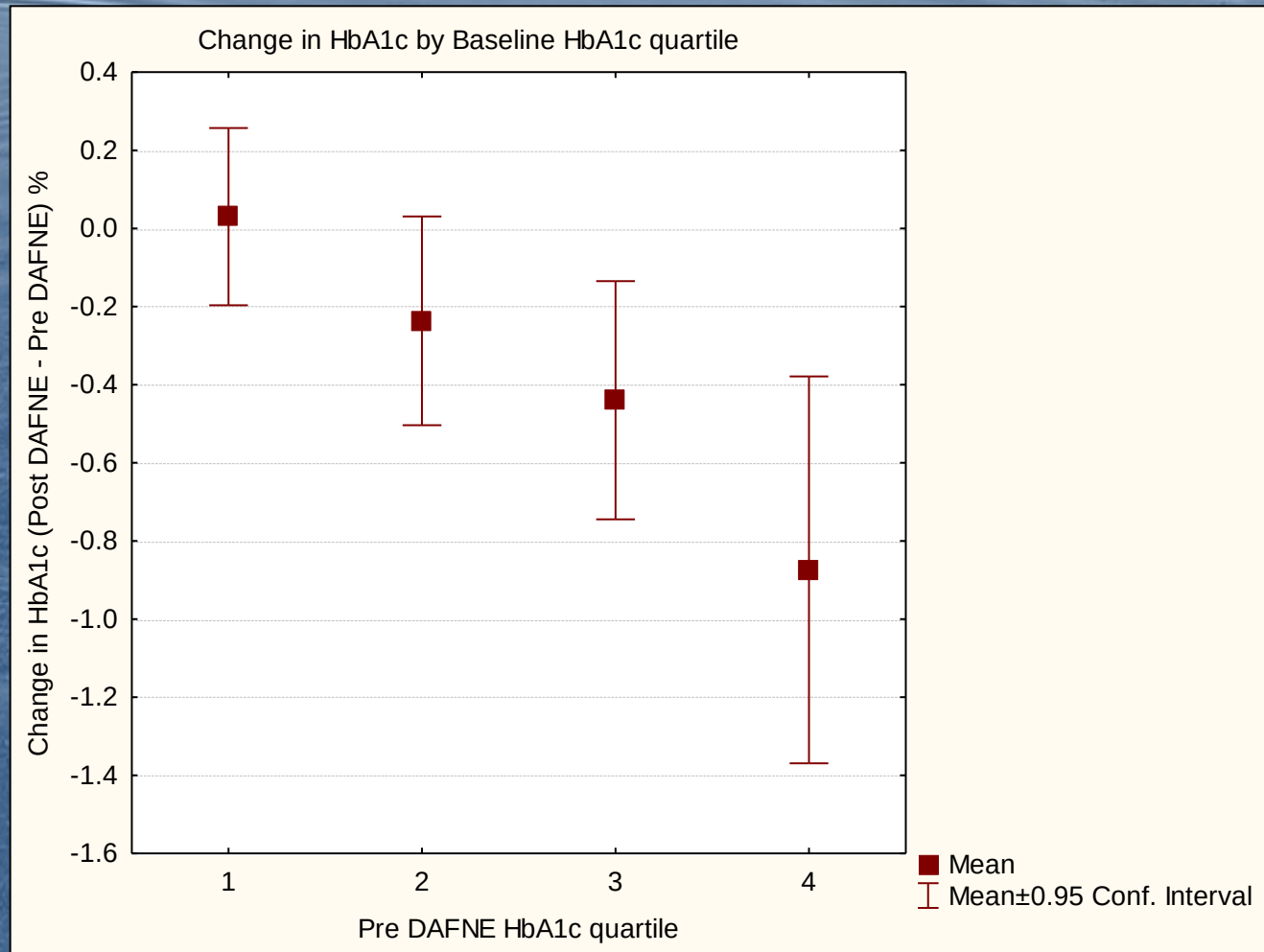
- HbA1c
- Hypoglycemia
- Quality of Life
- Weight and Diet



# Australian “OzDAFNE” Data

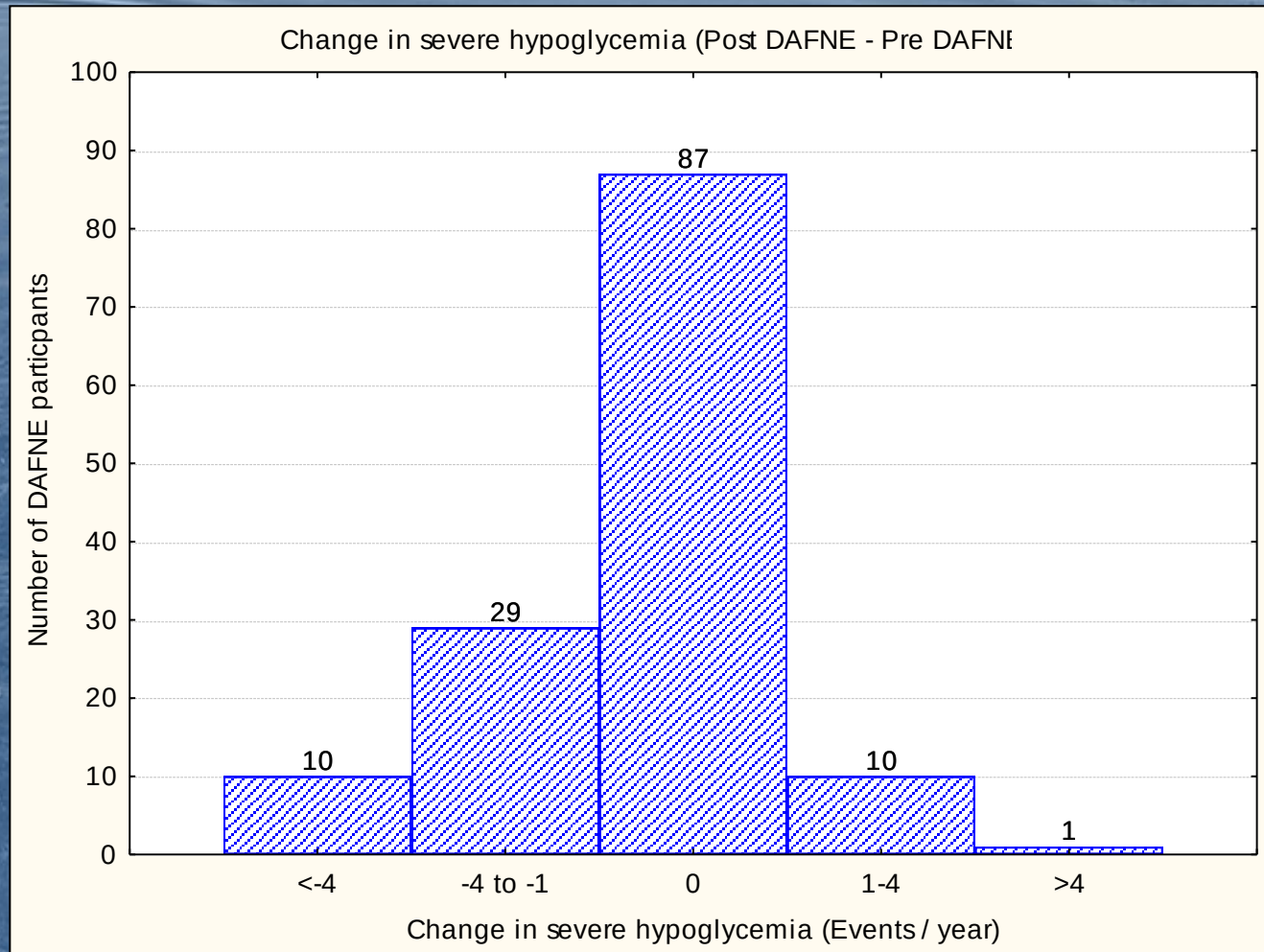
**McIntyre HD**, Knight BA, Harvey DM, et al. Dose adjustment for normal eating (DAFNE) – an audit of outcomes in Australia. Medical Journal of Australia. Jun 7 2010: 192 637 – 40

# OzDAFNE – Glucose Control



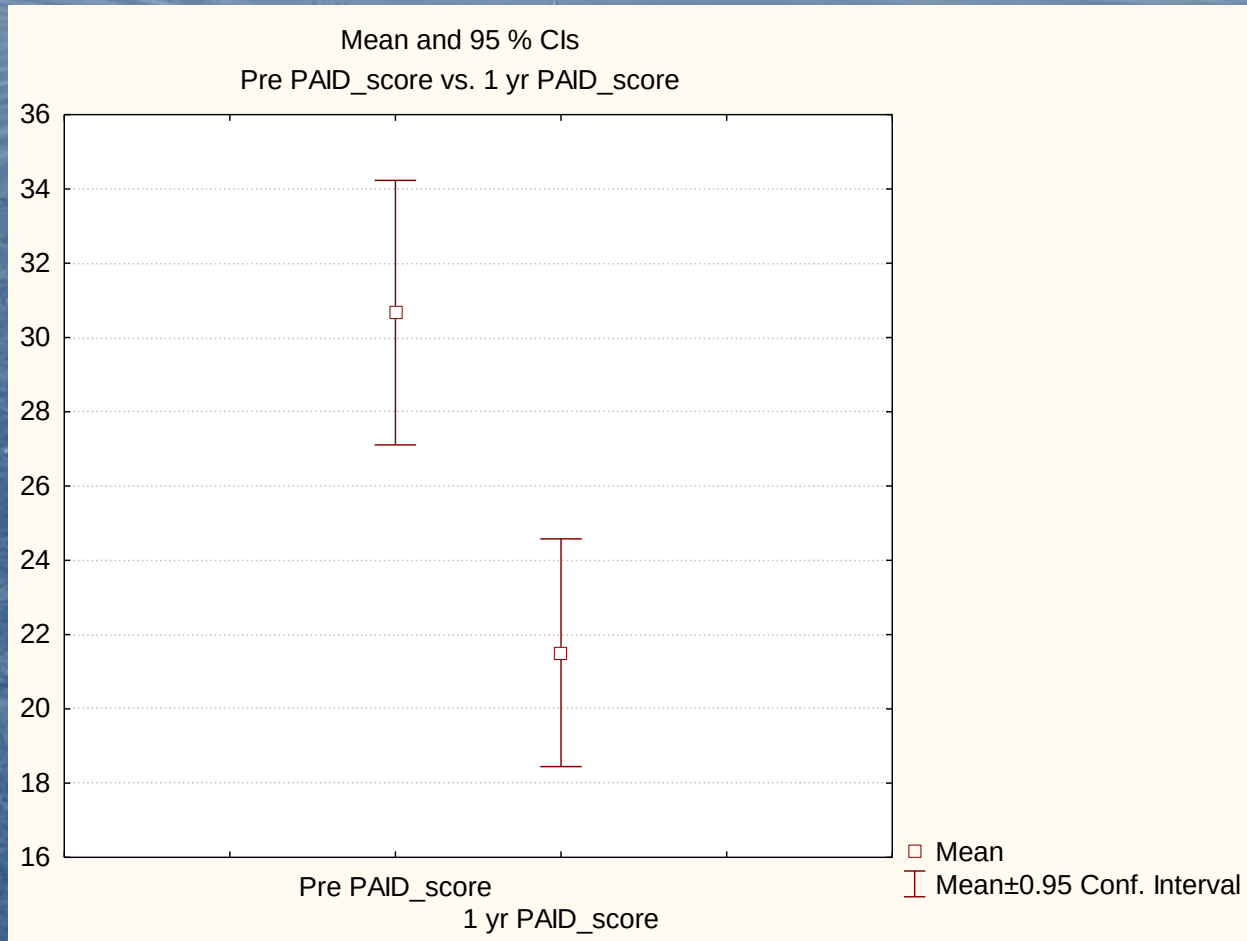


# OzDAFNE – Severe Hypos



# QoL Pre / Post OzDAFNE

## PAID (Problem Areas In Diabetes) scores

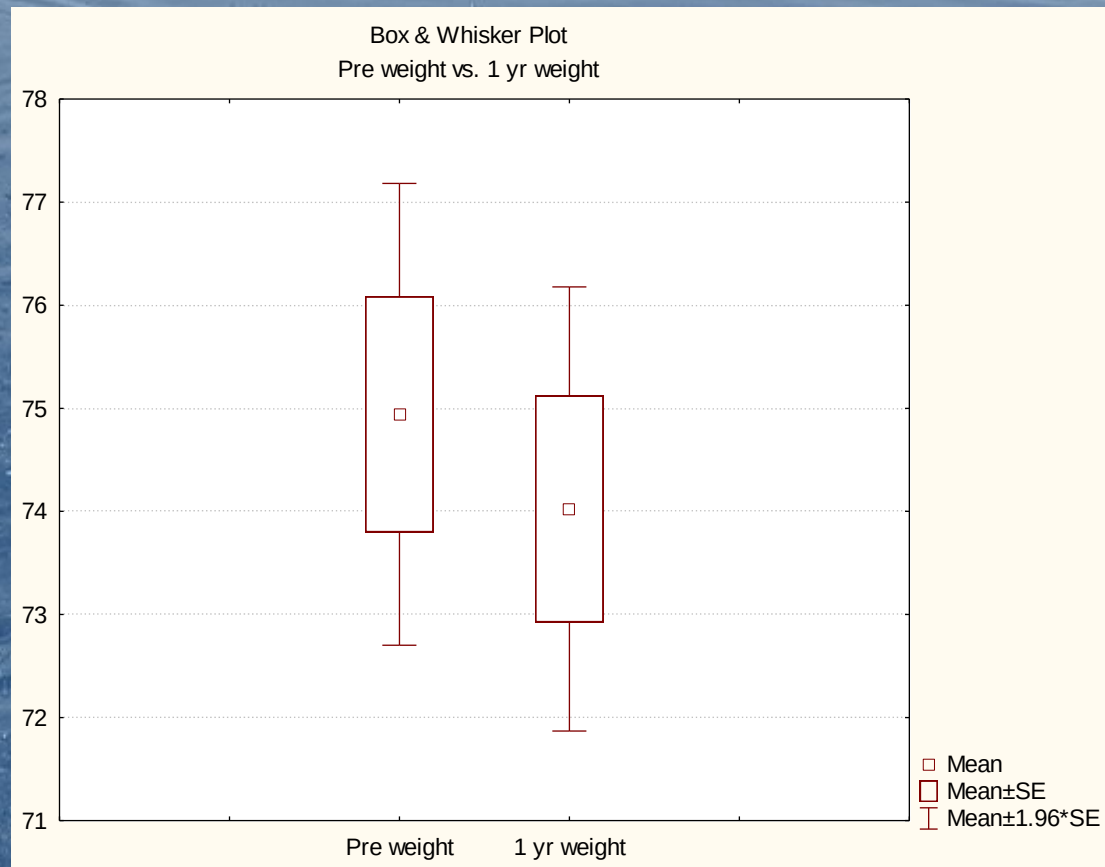




# Detailed OzDAFNE Quality of Life Data

- Total of 148 DAFNE participants at baseline and 12 months
- Comparison group 383 T1DM on MDI
- DAFNE – over time and vs. MDI
  - Greater improvement in well being
  - Improved self efficacy
  - Reduced diabetes related distress

# Weight Pre / Post OzDAFNE





# OzDAFNE Dietary follow up

- Concern that “dietary freedom” message of DAFNE might promote unhealthy eating patterns
- Brisbane study of 124 DAFNE participants at baseline; 46 with repeat data after 12 months
- Generally < 50% meeting EASD guidelines for protein / CHO / fat /saturated fat at baseline

# OzDAFNE Dietary follow up

- After 12 months (n=46)
  - No change in protein or fat intake
  - Reduced CHO intake
  - Frequent weight loss intention
- Major change appears to be “freedom” to eat CHO free or low CHO meals and reduced need for snacks

(Knight BK et al – submitted)



# DAFNE

## Unfortunately Not Free





# DAFNE and Expert Patients

- DAFNE helps People with T1DM to develop new skills in management of their diabetes after detailed instruction
- Some are also able to act as problem solvers and change agents for other people
- Promotes patient autonomy from health care professionals
- Provides possibility of “expert patients” as resource people for others



# DAFNE and Expert Patients

- **DAFNE courses still taught by Health Care Professionals**
- **DAFNE “graduates” have developed IT resources such as insulin dosing “APPS”**
- **Important role in peer support following initial education**
- **Potential role in raising awareness of intensive diabetes management**

# DAFNE and Expert Patients

## Limitations

- **Clinician behaviour – do diabetologists actually promote patient autonomy?**
- **Reduced confidence with greater time period post DAFNE** (Lawton et al DRCP 2012)
- **Confident self management does not guarantee ability to teach others**
- **Conflicting data in T2DM**
  - **No benefit** (Cade JF et al Diab Med 2009)
  - **Improved well being** (van der Wulp I Diab Med 2012)



# Oz DAFNE Status Report

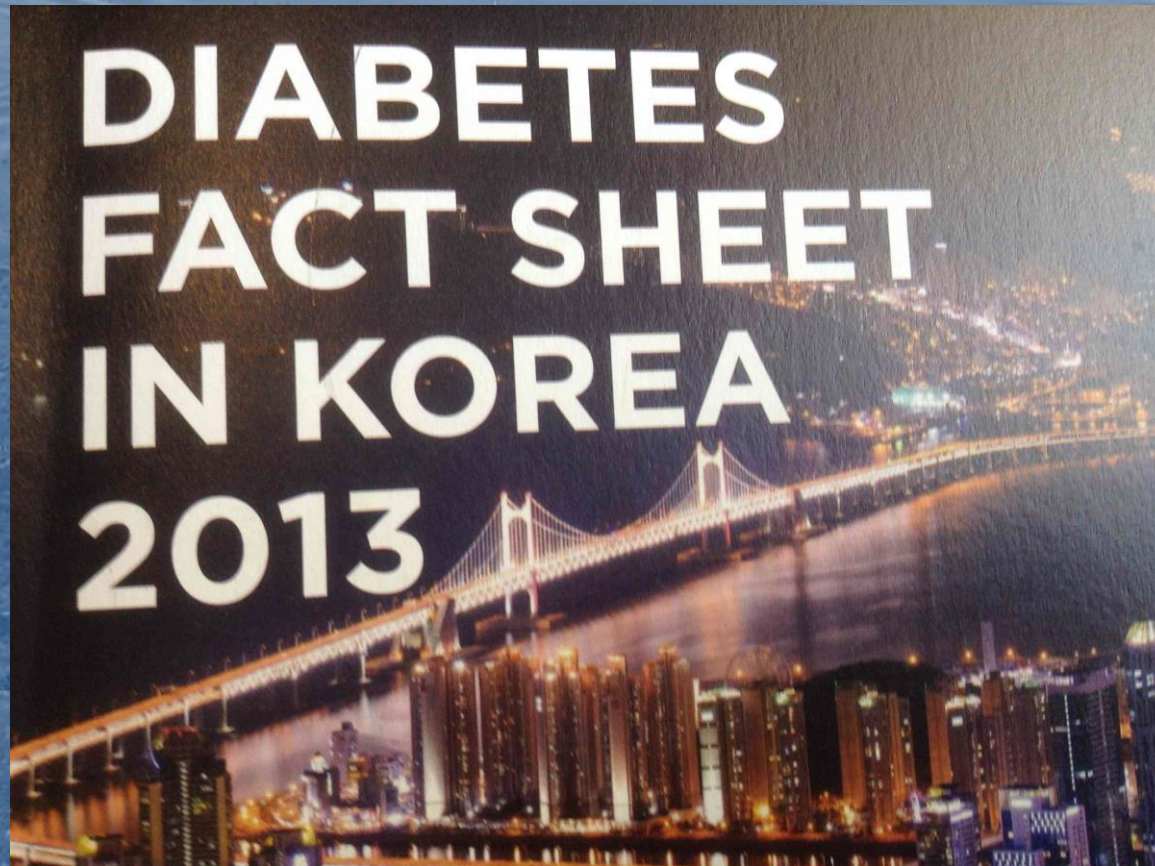
- Currently 19 active centres in Australia
  - 2 centres in NZ
  - 1 centre in Singapore
- Total 2679 OzDAFNE graduates (2261 in Australia)
- 34 DNEs and 28 Dietitians trained as DAFNE educators in Australia
- “Teen DAFNE” – Team Type 1 - under development in Australia

# DAFNE Funding Issues

- Not a drug
- Not a device
- Not a “supply”
- Ad hoc private health fund rebates
- T1DM a “Chronic Disease”?



# Type 1 Diabetes





# DAFNE Limitations

- Insulin Therapy (IT)101, not IT405
- “Highish” targets & No post prandial testing
- Developed, trialled with “old” insulin
  - ? Role of / evidence for insulin analogues
- A “7%” program, not a “6%” program
- DM101, not DM406
- “Rough” ratios (0.5 unit / 10g CP)



# DAFNE Limitations

- Competitor with “pumping”?
- Not profitable..... In Australia
- No consideration of GI
- Exercise and alcohol adjustments “rough”
- What is “normal eating”?
- No specific psychological component
- Glucose targets higher than pregnancy recommendations

# Pragmatic observations

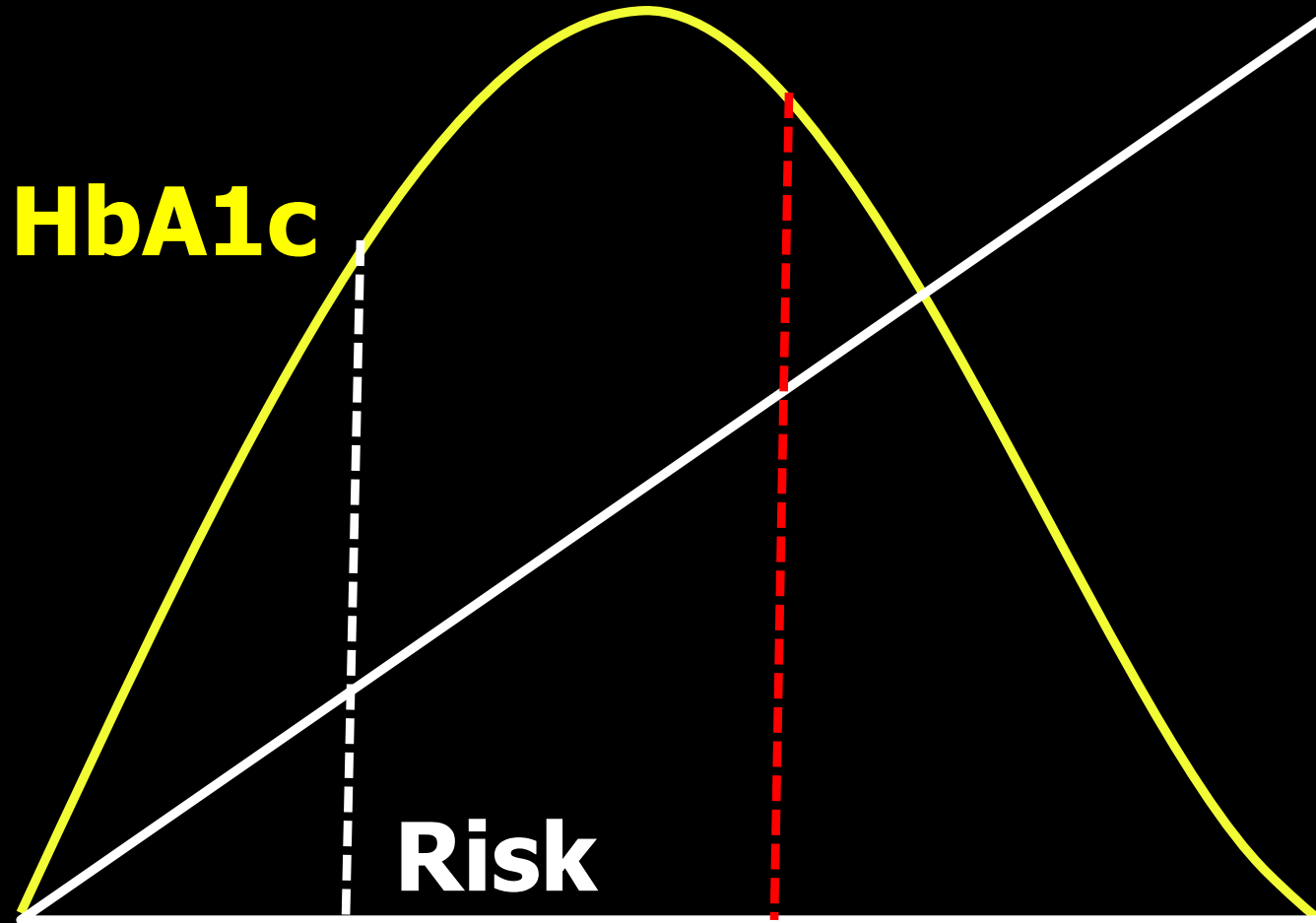
- If patient needs “conversion experience” seek religion, not DAFNE
- DAFNE is a complex intervention and difficult to “deconstruct”
- Close attention to “basic” DAFNE should produce an HbA1c  $\sim 7\%$
- Many people use DAFNE to avoid hypos and remain in their “comfort zone”



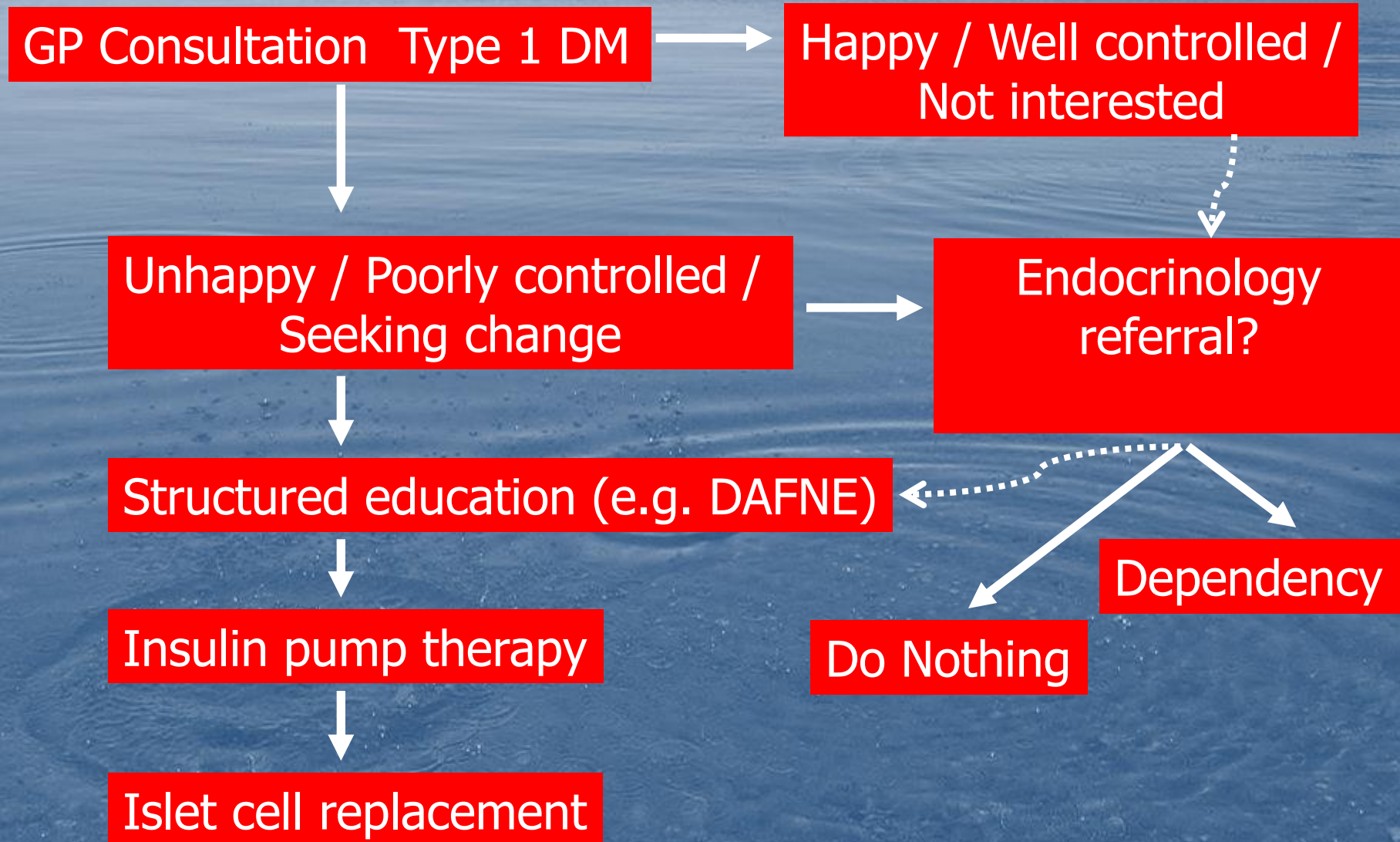
# Pragmatic observations

- Modified glucose targets may be used, either for:
  - Hypoglycemia, Hypo unawareness or
  - Tighter control - e.g. Pre pregnancy / pregnancy
- DAFNE training provides high degree of pump readiness

# Targeting interventions







# Many paths up the mountain





# The Choice?

