

# Aiming for the center of bullseye: the Diabetic Consultation Chart (DCC)

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A simple, user-friendly and effective method  
to improve diabetic patient outcomes



## AUTHORS

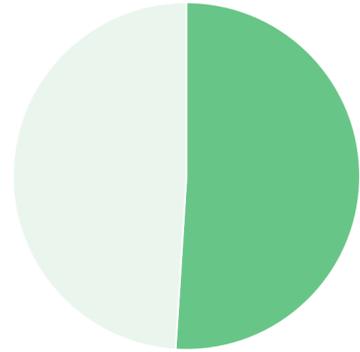
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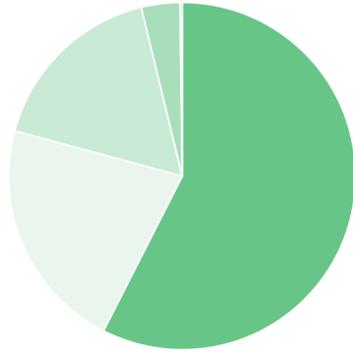
Email: [podgorsk@iafrica.com](mailto:podgorsk@iafrica.com)

## At our Practice



**51%**

Patients with diabetes



**57.5%** White

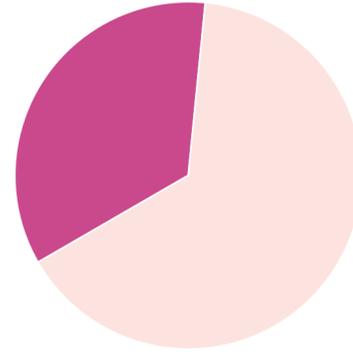
**21.7%** Black

**17.0%** Cape Malay

**3.6%** Asian descent

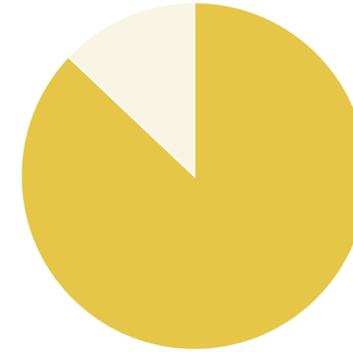
**0.2%** Mixed race

## The South African population at large...



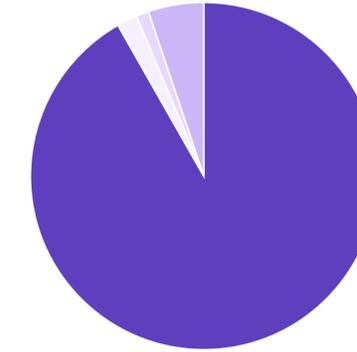
**34,9%**

SA's unemployment rate is highest in the world (third quarter of 2021)<sup>2</sup>



**87.05%**

SA's literacy rate (2017)<sup>2</sup>



Religion<sup>2</sup>

**78%** Christian

**1.6%** Muslim

**1.0%** Hindu

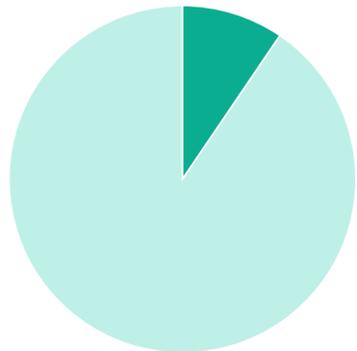
**4.4%** Traditional African Religions

**10%** 'Unspecified'

**4.5 million**

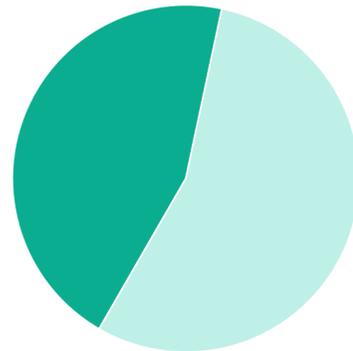
The number of adults with diabetes in South Africa<sup>1</sup>

## The South African population living with diabetes...



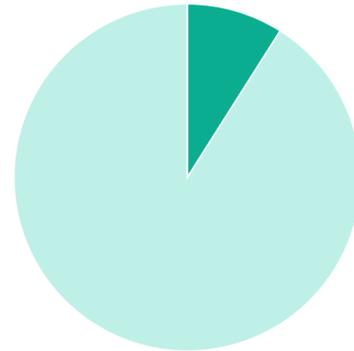
**9.5%**

Estimated national prevalence of diabetes based on HbA1c, in persons older than 15 years (2012)<sup>1</sup>



**45%**

of these individuals are undiagnosed



**9%**

South African population with abnormal glucose regulation (defined by an HbA1c between 6.0 and 6.4%)

### RSA is diverse, multiethnic and multicultural country.

At least thirty-five languages indigenous to South Africa are spoken in the Republic, eleven of which are official languages of South Africa: Ndebele, Pedi, Sotho, Swati, Tsonga, Tswana, Venda, Xhosa, Zulu, Afrikaans and English. The majority of the population are multilingual. The economic situation is also very disparate.

RSA now *also* has the highest proportion of adult diabetics on the continent, and **the greatest number of deaths due to the disease.**<sup>2</sup>

Dealing with a very diverse diabetic patients' population (across language, literacy, education level, economic status, religion and cultural background) makes achieving therapeutic goals more challenging.<sup>1</sup>

**Interventions helping to overcome these obstacles are urgently needed.**

# Objectives

The measurement of hypoglycemia awareness, stress and HbA1c levels and impact of visual representation of results on patient behavior and glycaemia, after 6 months intervention.

## RESEARCH DESIGN

- Group of Type 1 and Type 2 diabetics were allocated to intervention vs. standard therapy (ratio 1:1) between 8 March 2020 and 9 February 2021.
- All patients were from single private practice (GP).
- 113 patients (16 type 1 and 97 type 2) were enrolled to the study, but complete dataset was analysed from 76 patients (9 type 1 & 67 type 2).

## METHOD

Diabetes Consultations Chart (DCC), Diabetes Distress Scale 2 (DDS2), modified Clark & Gold Score (source: King's College Hospital London).

## STATISTIC

Effect size calculation with tailed t-test and Cohen's effect size

Dr. Gracjan Podgorski  
MEDICAL SPECIALIST INTEREST - DIABETES

Your name & Patient number: \_\_\_\_\_ Patient signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Diabetes Consultation Chart (DCC)**  
Answering a few questions (turn the page) will help us to prepare the best treatment plan for you. Please sign and write the date (above) if you agree.

You and your healthcare professional will fill this part out together. This is your personal care plan, and you can keep this to refer to.

Considering plotting a few points over a time and noting any changes.

Date: \_\_\_\_\_

**Your HbA1c scale**

**Your HbA1c scale**

Target HbA1c: \_\_\_\_\_

Gold Score (Hypa Risk score): \_\_\_\_\_

Living with Diabetes (DDS2): \_\_\_\_\_

**Suggested HbA1c scale**

Red	>9.0% >75 mmol/mol
Orange	<6.5% to 7.5-9.0% <48 mmol/mol or 58-75 mmol/mol
Yellow	6.5%-7.5% 48-58 mmol/mol

**Translating HbA1c into estimated average glucose levels**

HbA1c %	6	7	8	9	10	11	12
Average Plasma Glucose mmol/l	7	8.6	10.2	11.8	13.4	14.9	16.5

Normal (6-7%)    Caution (8-9%)    Danger (10-12%)

**Action for patient**

Agreed target HbA1c: \_\_\_\_\_ 1st follow-up date: \_\_\_\_\_ 2nd follow-up date: \_\_\_\_\_

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**Diabetes Distress Scale 2 (DDS2)**

Living with diabetes can sometimes be tough. You may experience many problems and hassles, and they can vary greatly in severity. IN THE LAST 4 WEEKS please consider the degree to which each of the items below may have distressed or bothered you.

Circle the appropriate number	Not a problem	Slight problem	Moderate problem	Somewhat serious problem	Serious problem	A very serious problem
Feeling overwhelmed by the demands of living with diabetes	1	2	3	4	5	6
Feeling that I am often falling with my diabetes routine	1	2	3	4	5	6

**Modified Clark & Gold Score** (Source: modified, King's College Hospital, London)

**Question 1**  
When my blood sugar is low:  
A - I always have symptoms  
B - I sometimes have symptoms  
C - I no longer have symptoms

**Question 2**  
Have you lost some of the symptoms that used to occur when your blood sugar was low?  
A - Yes  
B - No

**Question 3**  
In the past six months how often have you had moderate hypoglycaemia episodes (where you might have been confused, disoriented or lethargic and were unable to treat yourself)?  
A - Never  
B - Once or twice  
C - Every other month  
D - Once a month  
E - More than once a month

**Question 4**  
In the past year how often have you had severe hypoglycaemia where you were unconscious or had a seizure or needed glucagon or intravenous glucose?  
A - Never  
B - 1 to 3 times  
C - 4 to 7 times  
D - 8 to 11 times  
E - More than 12 times

**Question 5**  
How often in the last month have you had readings < 3.5mmol/l with symptoms?  
A - Never  
B - 1 to 3 times  
C - 1x weekly  
D - 2-3 times a week  
E - 4-5 times a week  
F - Almost daily

**Question 6**  
How often in the last month have you had readings < 3.5mmol/l without symptoms?  
A - Never  
B - 1 to 3 times  
C - 1x weekly  
D - 2-3 times a week  
E - 4-5 times a week  
F - Almost daily

**Question 7**  
How low does your blood sugar go before you feel symptoms?  
A - < 3.3 - 3.8 mmol/l  
B - 2.8 - 3.3 mmol/l  
C - 2.3 - 3 mmol/l  
D - < 2.2 mmol/l  
E - Always

**Question 8**  
Can you tell if your blood sugar is low by your symptoms?  
A - Never  
B - Rarely  
C - Sometimes  
D - Often  
E - Always

**Question 9**  
How well do you think you can detect blood glucose dropping < 3.5mmol/l?  
Always 1 2 3 4 5 6 7 Never

**Score**

Q1: \_\_\_\_\_  
Q2: \_\_\_\_\_  
Q3: \_\_\_\_\_  
Q4: \_\_\_\_\_  
Q5: \_\_\_\_\_  
Q6: \_\_\_\_\_  
Q7: \_\_\_\_\_  
Q8: \_\_\_\_\_  
Q9: \_\_\_\_\_

Total score R = \_\_\_\_\_

R > 4 = reduced awareness of hypoglycaemia

# Results

## DDS2

- t-score 2.89
- SD 0.25
- two-tailed p-value 0.01
- confidence range: mean difference 0.73
- confidence range 0.23 - 1.24

## CLARK & GOLD SCORE

- t-score 1.42
- SD 0.19
- two-tailed p-value 0.31
- confidence range: mean difference 0.27
- confidence range 0.11 – 0.64

## HbA1c

- t-score 2.28
- SD 0.13
- two-tailed p-value 0.045
- confidence range: confidence difference 0.29
- confidence range: confidence range 0.04 -0.53
- Cohen's effect 0.14

## CONTROL GROUP

- t-score 0.47
- SD 0.10
- two-tailed p-value 0.64
- confidence range: mean difference 0.05
- confidence range 0.16 - 0.25

Dr. Gracjan Podgorski  
PHYSICIAN, SPECIALIST INTEREST - DIABETES

# 99

Date 9/9/20

Diabetes Consultation Chart (DCC)  
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You and your healthcare professional will fill this part out together. This is your personal care plan, and you can keep this to refer to.

Consider plotting a few points over a time and noting any changes.

Date Your HbA1c scale

4/09/20 7.8

4/3/20 8.2

Your HbA1c scale

Target HbA1c

Gold Score (Hypo Risk score)

Living with Diabetes (DDS2)

Suggested HbA1c scale

- >9.0% >75 mmol/mol
- <6.5% or 7.5-9.0% <48 mmol/mol or 58-75 mmol/mol
- 6.5%-7.5% 48-58 mmol/mol

Translating HbA1c into estimated average glucose levels

HbA <sub>1c</sub> %	6	7	8	9	10	11	12
Average Plasma Glucose mmol/l	7	8.6	10.2	11.8	13.4	14.9	16.5

Normal Caution Danger

Action for patient

Agreed target HbA1c < 7.0%

1st follow-up date 9/10/20

2nd follow-up date Sep 2020

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# Conclusion

Measuring stress (DDS2) and HbA1c level and graphic representation of results with bull's-eye for diabetic patient helped to focus the consultation and reduced significantly both stress level (by 1 point) and HbA1c level (by 0.3%) after 6 months.

There was no significant change in Clark and Gold score (hypoglycemia awareness).

## REFERENCES

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# Discussion

- Evidence from prospective randomized clinical trials in patients with both type 1 and type 2 diabetes indicates that **outcomes related to microvascular damage are related to glycemic control.**
- **Stress may have negative effects on health and patients with diabetes may be at increased risk.**  
The experience of stress is associated with the release of counter regulatory hormones and energy mobilization, often resulting in elevated glucose levels. In addition, stress can disrupt diabetes control indirectly through effects on diet, exercise, and other self-care behaviors.
- An increase in TIR of 10% (2.4 h per day) corresponded to a decrease in A1C of approximately 0.5% (5.0 mmol/mol).<sup>3</sup>
- Reduction of HbA1c by 0.3% and stress level by one point (SSC) might have a significant clinical benefit.
- **Reduction of stress level combined with visual representation with DCC therapeutic targets and achieved results might help in understanding diabetes and accomplishment therapeutic goals** in this diverse diabetic patient population.<sup>4</sup>
- Incidence of hypoglycaemia among insulin-treated patients with type 1 or type 2 diabetes mellitus: South African cohort of International Operations Hypoglycaemia Assessment Tool (IO HAT) study was designed to assess the incidence and rates of hypoglycaemia in patients with type 1 diabetes mellitus (T1DM) or type 2 diabetes mellitus (T2DM) in the South African cohort of the International Operations Hypoglycaemia Assessment Tool (IO HAT) study. This first patient dataset of self-reported hypoglycaemia in South Africa; results showed that hypoglycaemia is under-reported. One of the reasons is presence of hypoglycemia unawareness. Clarke and Gold questionnaire helped to identify patients with hypoglycemia unawareness - but it did not change the final score.