



Ministry of Public Health and Sanitation
The National Diabetes Prevention and Control Program

DIABETES PREVENTION AND MANAGEMENT

A guide for community health workers

March 2012

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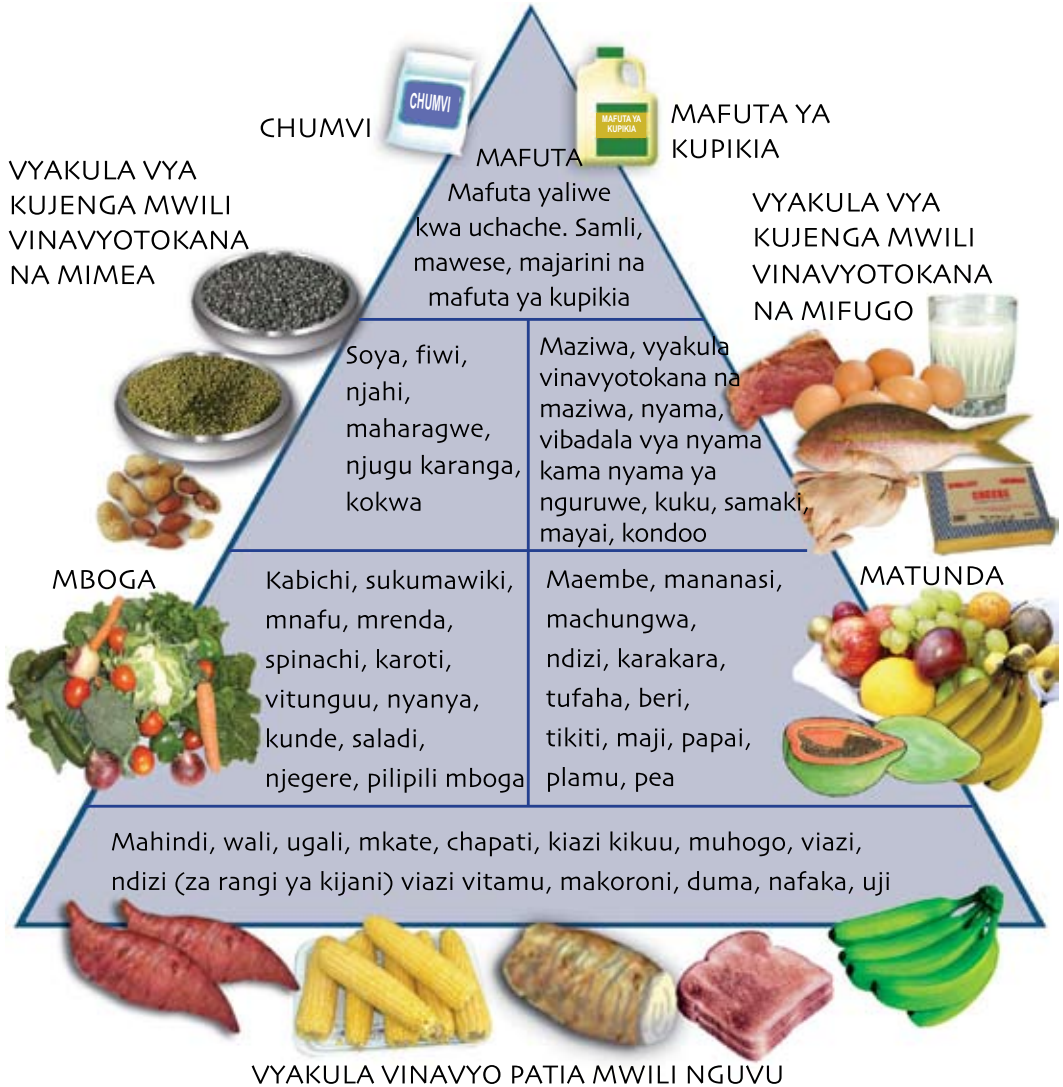
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AFYA YAKO YATEGEMEA VYAKULA UNAVYOKULA



INTRODUCTION

What is diabetes?

Diabetes is a lifelong condition characterized by high blood sugar resulting from:

- Lack or insufficient production of insulin
 - Insulin resistance (inaction)
 - Both
- Our body needs glucose (from food) to make energy.
 - Insulin is a chemical produced by the pancreas which helps the body to utilize glucose. It acts like a key that opens the body cells for glucose to enter so that it can be used for energy production.
 - When cells do not take up glucose it overflows and floods the blood system, this is then referred to as high blood sugar or hyperglycemia.

TYPES OF DIABETES

There are 3 Main types of Diabetes

Type 1

- Results from absolute lack of insulin
- It is of a sudden onset and can develop at any age but usually occurs before the age of 30, and especially in childhood. The causes of this are when the pancreas cannot produce insulin. Account for about 5 to 10% of all cases of diabetes.
- People with type 1 diabetes need insulin for survival.

Type 2

- Type 2 diabetes develops when the body cannot make enough insulin or when the insulin that is produced does not work properly (known as insulin resistance).
- Usually appears in people over the age of 40, but it is becoming more common in the young.
- It can be controlled by a healthy diet, increased physical activity and oral drugs and later may eventually require insulin for control.

Diabetes during Pregnancy (Gestational diabetes)

- Diabetes detected for the first time during pregnancy.
- GDM occurs because the body cannot produce enough insulin to meet the extra needs of pregnancy.
- GDM usually disappears after giving birth and may indicate an increased risk of Type 2 diabetes

UGONJWA WA KISUKARI NI NINI?

Kisukari ni hali ambayo mwili hukosa kutengeneza “insulin” inayotosha na hivyo kusababisha viwango vya juu vya sukari katika damu. (“Insulin” ni kemikali itokayo kwenye kongosho inayorekebisha kiwango cha sukari kwenye damu.)

Sukari hutumika mwilini kutupa nguvu. “Insulin” nayo husaidia sukari kufika kwenye sehemu za mwili kutupatia nguvu. Watu wasiokuwa na ugonjwa wa kisukari, kuna usawa kati ya sukari na “insulin”



Katika ugonjwa wa kisukari hakuna usawa kabisa baina ya “insulin” na sukari kwa sababu mwili hautengenezi “insulin” ya kutosha. Hii ina maana kuwa mtu aliye na ugonjwa wa kisukari ana viwango vya juu vya sukari katika damu. Hali hii isipodhibitiwa inaweza kusababisha madhara mengi.

Kuna aina mbili kuu za ugonjwa wa kisukari:

AINA YA KWANZA	AINA YA PILI
Mwili hautengenezi “insulin” yoyote	Mwili hautengezi insulin ya kutosha au “insulin” haifanyi kazi inavyostahili
Lazima mtu ajidunge sindano ya insulin. Mtu atahitaji “insulin”	Hutibiwa kwa chakula bora, mazoezi na tembe za kumeza. Mara nyingine “insulin” hutumiwa kudhibiti aina hii ya ugonjwa wa kisukari
Kwa kawaida hutokea kwa watoto na vijana	Kwa kawaida, aina hii ya ugonjwa wa kisukari hutokea kwa watu wazima



Kwa maelezo zaidi kuhusu ugonjwa wa Kisukari tembelea kituo cha afya kilichoko karibu nawe au Kituo cha udhabiti na habari za ugonjwa wa kisukari nchini Kenya.
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Signs and Symptoms of Diabetes

They include:

- Frequent urination
- Excessive thirst
- Extreme hunger
- Unexplained weight loss
- Increased fatigue
- Irritability
- Blurred vision
- Itching of the private parts in women
- Slow healing of cuts and wounds
- Impotence-failure to sustain an erection.
- Numbness, burning sensations ,pins and needles of the feet and hands

NB: a person can be living with diabetes without experiencing the symptoms, thus regular blood sugar testing is recommended.

JE, UTAJUAJE UNA UGONJWA WA KISUKARI?

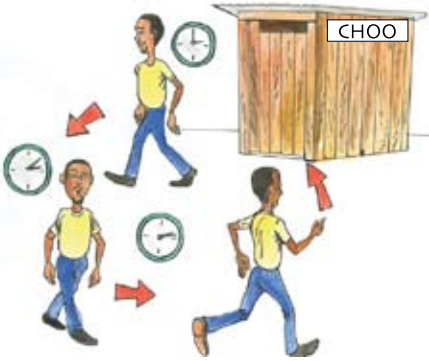
Ugonjwa wa Kisukari unaweza kujidhihirisha kwa njia zifuatazo:



Kuwa na kiu ya kupita kiasi



Kuhisi njaa mara kwa mara



kwenda haja ndogo mara kwa mara



Kupunguza au kuongeza uzito wa mwili bila kutarajia



Kuchoka na kusinzia mara kwa mara



kuwa na shida ya kuona vizuri



Risk factors of diabetes

The risk factors of diabetes can be grouped into 2

1. Those that cannot be modified
 - a. Advancing age
 - b. Family history of diabetes

2. Those that are modifiable
 - a. Overweight and obesity
 - b. Alcohol use
 - c. Tobacco use
 - d. Physical inactivity
 - e. A stressful lifestyle
 - f. Unhealthy diet

Diagnosis

Diagnosis of diabetes

In the majority of people presenting with the classical symptoms of diabetes, the diagnosis is straightforward.

A fasting blood sugar level of more than 7mmol/l is diagnostic (fasting means a person has not eaten overnight or for the last 8 hour)

A random blood sugar of more than 11.1mmol/l is diagnostic of diabetes.

(A random blood sugar of between 7.1mmol/l and 11.1mmol/l refer to hospital to confirm diagnosis)

Je, ni kina nani walio na uwezekano mkubwa wa kupata ugonjwa wa kisukari?

1 Watu waliozidisha uzito wa kawaida/ watu wanene



2 Wanaotokana na familia zenye historia ya ugonjwa wa kisukari



3 Walio na ugonjwa wa Presha (Pressure)

4 Walao chakula kilicho na mafuta mengi mara kwa mara



5 Wavutaji sigara



6 Kuzaa mtoto mwenye uzani mkubwa au mnene



7 Wale wasiofanya mazoezi kila mara



Kwa maelezo zaidi kuhusu ugonjwa wa Kisukari tembelea kituo cha afya kilichoko karibu nawe au Kituo cha udhabiti na habari za ugonjwa wa kisukari nchini Kenya.
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Management of diabetes

- The goal of diabetes management is to improve the quality of life and productivity of people living with diabetes.
- There are two modalities of managing diabetes.
(diabetes education goes hand in hand with these two methods)
 - Non drug method (use of proper diet and physical activity)
 - Use of Drugs e.g. diabetes tablets for lowering blood sugar and insulin

1. Education

Community Members including People living with diabetes need to know:

- That diabetes is a serious lifelong disease that has no cure, but can be controlled.
- That the pillars of management include:
 - diabetes education
 - knowing what foods to eat, how much and how often to eat,
 - knowing the importance and precautions of exercise,
 - how and when to take diabetes medications
- That community should know and be encouraged to seek regular medical checkups which is essential for early detection of the disease
- People with diabetes need to know how to identify diabetes related emergencies arising from low or high blood sugar levels and when to seek medical help.
- Pregnant mothers to be encouraged to check their blood sugars regularly .
- Complications of diabetes are preventable.
- Good blood sugar control is essential to prevent long term complications of diabetes.
- That people with diabetes have to look after their feet to prevent injuries and thus prevent ulcers and amputations

NJIA ZA KUDHIBITI UGONJWA WA KISUKARI



Watu wote wenye kisukari wanahitaji kuelimishwa vyema kuhusu ugonjwa huu

Ugonjwa wa kisukari waweza kudhibitiwa kwa mojawapo wa njia hizi:

1. Chakula bora na mazoezi
2. Chakula bora, mazoezi ya viungo na dawa za kisukari za tembe
3. Chakula bora, mazoezi ya viungo sindano ya insulin bila ama pamoja na tembe za kisukari tembe za kisukari.



2. Healthy diet

Eating a healthy diet and increasing the level of physical activity should be the first steps in the management of newly diagnosed people with diabetes, and have to be maintained.

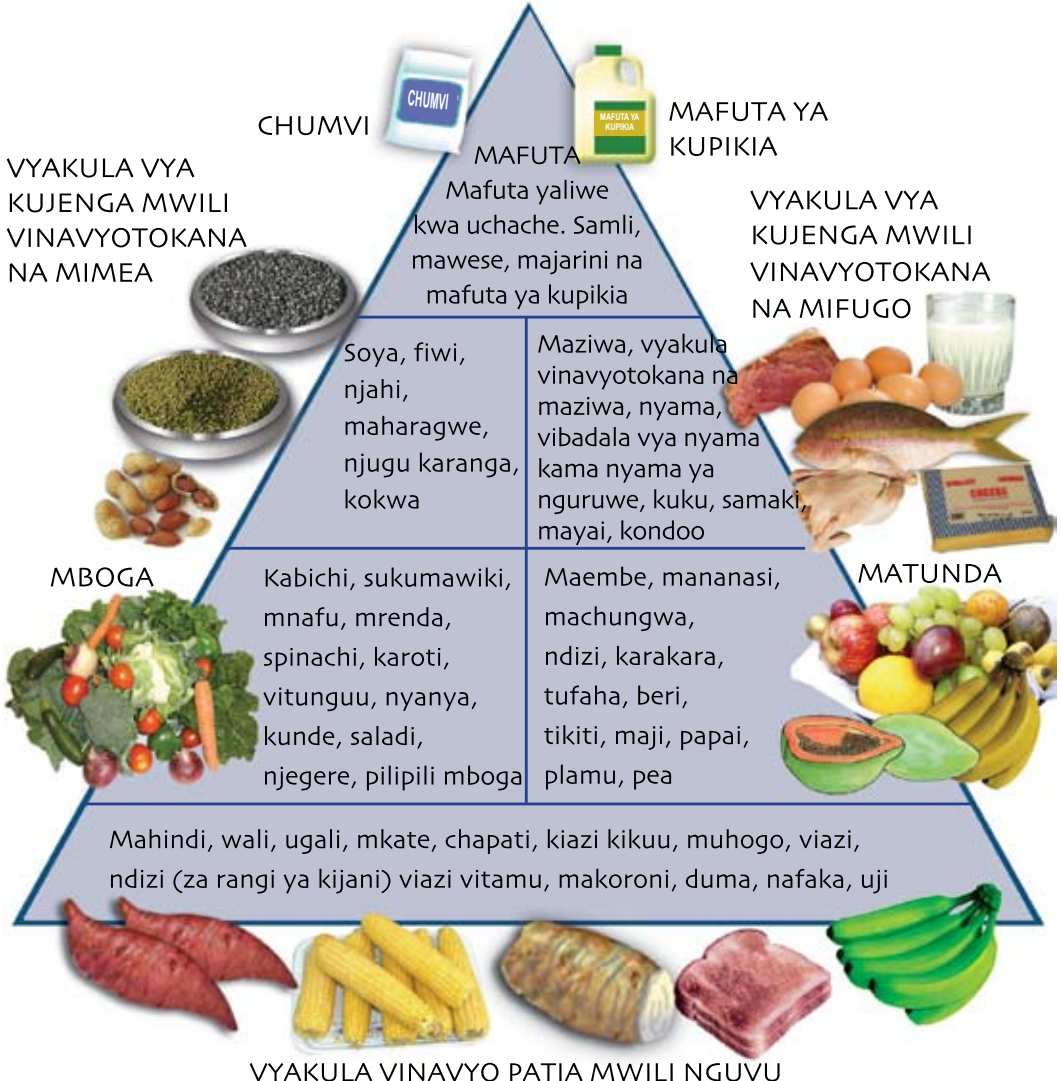
Good dietary practices in the management of diabetes mellitus

- Appropriate diet and physical activity is important in maintaining an ideal body weight.
- Reduced intake of animal fat, salt, and refined foods is recommended.
- Locally available foods high in fiber, vegetables and fruits should be encouraged in the community
- The nutritionist or a trained diabetes educator can help you know the appropriate food portion sizes to meet your dietary requirement.
- Eat a variety of foods in at-least three meals a day.
- Alcohol and tobacco products use should be avoided.
- Water is essential for normal body functioning. At - least eight glasses of water should be taken per day.

UGONJWA WA KISUKARI: PIRAMIDI YA CHAKULA

Piramidi hii inajumulisha makundi ya vyakula kulingana na mahitaji ya kikaroli ili kuwawesha watu kufanya maamuzi bora kuhusu vyakula vyao

Sehemu tatu za chini zinajumuisha makundi makuu matano ya vyakula. Ili kuwa na afya bora kula vyakula vingi kutoka makundi yote matano



3. Physical activity

- Regular physical activity helps in;
 - Increasing insulin sensitivity thus improving blood sugar control
 - Controlling blood pressure
 - Improving blood flow in the heart and vessels
 - Weight loss and maintenance of healthy body weight,
 - Giving one a sense of well-being.
- Physical activity should be regular (-3 days/week), lasting at least 20-30 min. per session, and be of at least moderate intensity.
- **Examples of physical activities you can involve yourself include;**
 - Housework
 - Gardening
 - Walking
 - climbing stairs
- **Examples of exercises you can involve yourself include**
 - Fast walking
 - Cycling
 - Jogging
 - Playing games
 - Weight lifting
 - Rope jumping
 - Swimming
 - Indoor exercises e.g sit ups and press ups.
- Activities like walking, climbing steps (instead of taking lifts) should be encouraged.
- People with diabetes require proper medical assessment before engaging in vigorous physical activity
- Proper shoes must always be worn during exercises to avoid injury to the feet.

MAZOEZI NA UGONJWA WA KISUKARI



Cheza mpira

Mazoezi ya kila mara hukusaidia:

- Kudhibiti kiwango cha sukari katika damu
- Kudumisha afya yako
- Kupunguza mafadhaiko
- Kudhibiti uzani
- Kupunguza "presha" (Damu kwenda mbio) na mafuta mwilini

VIDOKEZO

Fanya mazoezi kila siku



Tembea zaidi kuliko kutumia gari



Endesha baiskeli



kulima



Tumia ngazi badala ya lifti



Kuruka kamba

4. Management of diabetes using drugs

Diabetes is managed by use of medicines that can either be:

- Oral blood sugar lowering tablets
- Insulin injection

It is important to note that;

- Oral Tablets are used when an individuals' blood sugar control is not achieved using the combination of dietary modifications and physical activity/exercise.
- Patients currently using tablets to control their blood sugar may at one time in the future need insulin as these tablets may no longer work in them.
- In some cases, oral tablets or insulin injection may be given at the time of diagnosis of diabetes if the blood sugar is extremely high. I.e. a fasting blood glucose level more than 11 mmol/L or random blood glucose level more than 15 mmol/L.
- Individuals with type 1 diabetes must be on insulin for survival.

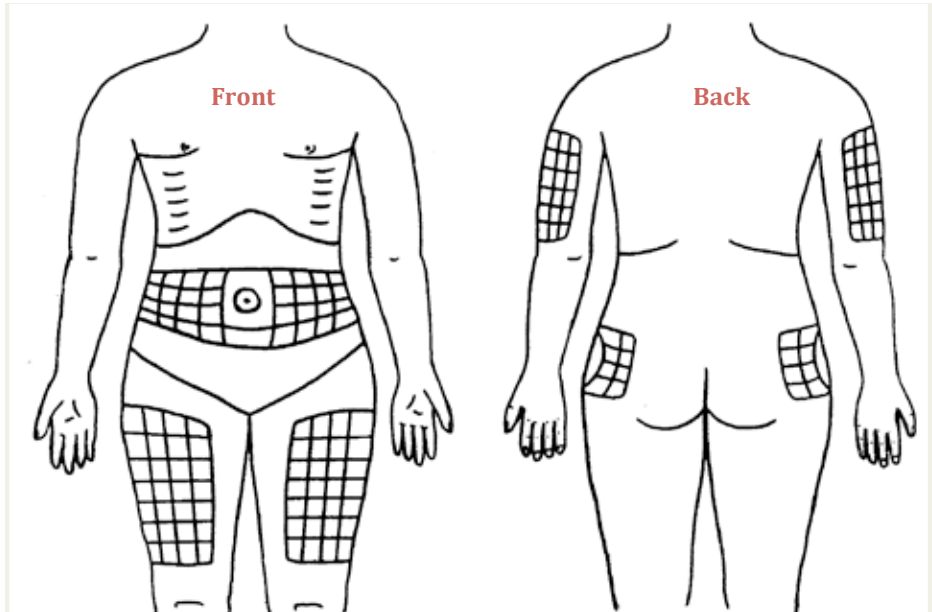
Principles of insulin administration

- The injection sites most commonly used for insulin are the abdomen, the thigh, and the outer upper arm.
- The rate of absorption is fastest on the abdomen.
- The thigh should be avoided as an injection site when exercise is going to be done, as this will increase the rate of absorption of the insulin.
- One area should be used for an injection at a particular time of day, e.g. the abdomen is the site for the morning injection, and the thigh is the site for the evening injection.
- Within these areas, the injection site is to be rotated. To avoid formation of a hard scar (seen as a lump)
- Injection on these scars should be avoided as insulin absorption is not predictable
- The injection should be done at a 90-degree angle with the skin using the recommended insulin administration syringe and needle.
- The needle should be held in place for 10 seconds after injection before withdrawal.

Insulin injection technique



Insulin injection sites



Complications of Diabetes

Early diagnosis of diabetes, good management and regular screening for complications can do much to reduce the burden that complications can impose on people living with diabetes and the health care system.

Diabetes complications are divided into two broad groups

1. Short term complications
2. Long term complications

SHORT TERM COMPLICATIONS

Hypoglycemia (low blood sugar)

Occurs when the blood sugar is too low; less than 3.5mmols/l
It requires immediate treatment.

Causes:

- Skipping or delaying meals
- Eating inadequate meal portions
- Side effect of medication
- Alcohol Intake
- Wrong timings of medication
- Drug overdose
- Unplanned and excessive physical activity

Signs and Symptoms:

- Dizziness
- Weakness
- Cold , sweaty skin
- Profuse sweating
- Hunger
- Irritability
- Bad dreams
- Confusion
- Reduced concentration
- Nervousness
- Fast heartbeat
- Headache
- Numbness of tongue and mouth
- Fainting and loss of consciousness

SUKARI SHUKATITI NI NINI

Sukari shukatiti ni hali ambapo kiwango cha sukari katika damu kipo chini kupita kiasi cha kawaida.

Mtu aliye na ugonjwa wa kisukari anaweza kuwa na kiasi kidogo cha sukari katika damu yake kwa sababu ya:

- Kufanya mazoezi bila kula chakula
- Kukosa kula chakula wakati unaofaa



Unywaji wa pombe



Kuzidisha kiasi cha dawa kinachohitajika

Ishara/ dalili za sukari shukatiti katika damu

1. Moyo wako kupiga kwa kasi/ haraka sana
2. Kutetemeka
3. Kuhisi njaa
4. Kizunguzungu
5. Kuona kiwiliwili
6. Kuchanganyikiwa
7. Kutokwa na jasho sana
8. Uchovu



Iwapo utakuwa na ishara kama hizi, kula au unywe vyakula vilivyo na sukari mara moja: Kwa mfano



Peremende

Sukari



Keki



Ndizi



Kiazi kitamu



Soda



Embe



Chungwa



Papai



Iwapo mtu amepoteza fahamu, rowesha sukari kidogo kisha umpake kwenye ufizi wa meno

FAHAMU: Usimpe mtu aliyepoteza fahamu chakula au kinywaji chochote kupitia kinywani/ mdomoni



Prevention and Treatment of Hypoglycemia (low blood sugar)

When the signs and symptoms of hypoglycemia are noted, eat or drink a fast acting sugar e.g 3 teaspoons of sugar or honey (can be dissolved in water) ,3 sweets, 3 biscuits or 3/4 cup of juice or soda. Then eat a meal.

In case of unconscious person DO NOT give fluids or food. Instead apply moistened sugar or honey on the inner cheek lining (not on the tongue)

If symptoms persist or recur refer to the hospital.

Prevention of hypoglycemia

- Avoid skipping or delaying meals
- Eat adequate food portions
- Use medications as prescribed (dosage and timing)
- Avoid alcohol use
- Avoid unplanned and excessive physical activity

NOTE:

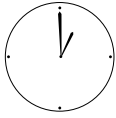
THE PATIENT SHOULD ALWAYS CARRY SOME SUGAR SOURCE (e.g. 3 sweets, 3 biscuits or a light meal)

THE PATIENT SHOULD ALWAYS CARRY OR WEAR AN IDENTIFICATION TAG/BRACELET/CARD STATING THAT THEY HAVE DIABETES

*A note on hyperglycemia (high blood sugar)

In case the blood sugar remains persistently high despite following the healthcare worker's instructions on medication, please refer the patient urgently to see the nearest health facility.

JINSI YA KUEPUKANA NA SUKARI SHUKATITI



Usikose kula chakula, kula wakati ufao



Ni muhimu kupima kiwango cha sukari katika damu yako kila mara



Meza dawa kulingana na maagizo ya daktari



Hakikisha umewajulisha jamaa na marafiki wako kwamba una hatari ya kupata Sukari Shukatiti na jinsi ya kutatua hali hii



Jiepushe na unywaji wa pombe



Long term complications of diabetes

Poorly controlled blood sugar can lead to long term complications of diabetes. Long term complications arise due to damage of the blood vessels resulting in;

1. Diseases of the large blood vessels (affects the brain and heart)
2. Diseases of the small blood vessels and nerves (affects the eyes, kidneys, sexual organs and feet)

Diabetes and the Brain

A person with diabetes is at higher risk for stroke than the general population. Persistently elevated blood sugar levels contribute to the buildup of deposits in blood vessels thus leading to impaired blood flow or complete blockage and subsequently stroke.

Diabetes and the Eye

Uncontrolled Diabetes damages the small blood vessels at the back of the eye that enables one to see leading to poor vision and eventually to blindness. People with poorly controlled diabetes develops cataract at an earlier age than others.

Diabetes and the Heart

High blood sugar levels over time can lead to deposits causing the narrowing and the hardening of blood vessels that supply oxygen to the heart. Therefore flow of blood to the heart can slow down or stop causing a heart attack.

Heart disease is the leading cause of death for people with diabetes

Diabetes and the Kidney

High blood sugar can overwork the kidneys causing them to stop working properly and cause them to leak protein in the urine leading to kidney failure in the long run.

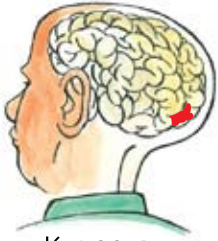
Diabetes and the sexual function

Poorly controlled diabetes damages nerves and blood vessels which are important for functioning of sexual organs. In women it may cause reduced urge to sex and painful intercourse.

In men, it may cause impotence and erectile dysfunction. This increases with age and has a major psychological impact.

MADHARA YANAYOTOKANA NA UGONJWA WA KISUKARI

Kuongezeka kwa kiwango cha sukari katika damu kwaweza kusababisha matatizo kama vile:



Kupooza



Upofu



Ugonjwa wa moyo



Magonjwa ya figo



Hanithi - udhaifu wa nguvu za kiume



Kukatwa kwa kiungo cha mwili

Diabetes and the feet

Uncontrolled diabetes can lead to nerve damage or poor blood supply to the feet and can lead to wounds on the feet which can get infected which if untreated can lead to amputation (cutting of the leg).

The Do's of Diabetes Foot Management

1. Wash your feet regularly and dry between the toes
2. Cut nails straight with a nail cutter and file the sharp edges
3. Examine your feet daily, using a mirror or use an assistant
4. Seek medical attention for bruises, cuts or blisters
5. Examine your shoes daily for any foreign objects
6. Moisturize your feet using creams or lotions
(Avoid petroleum based jelly)
7. Test bathing water with your elbow before washing your feet to avoid burns
8. Wear loose absorbent socks
9. Shoes should be:
 - Closed and well fitting
 - Fastened with laces or velcro
 - Wide enough to accommodate the toe
 - Bought in the afternoon as feet tend to swell towards the evening

The Don'ts of Diabetes Foot Management

1. Avoid walking bare foot
2. Avoid smoking as it can harm blood circulation in your feet
3. Avoid touching hot surfaces
4. Avoid shoes with high heels and pointed toes.
5. Avoid open shoes or sandals
6. Avoid warming your feet in front of open fire
7. Avoid wearing tight shoes without proper support and laces

Maambukizo ya miguu ni mojawapo ya madhara kuu inayosababishwa na ugonjwa wa kisukari



Usikate sagamba katika vidole vya miguu au kutumia kifaa chenye ncha kali kwenye miguu yako



Panguza miguu vyema kila inapopata maji haswa katikati ya vidole



Kagua nyayo zako kila mara



Usivae viatu vya juu



Usivae soksi zinazokaza miguu



Vaa viatu vya chini vinavyokutosha vyema

Tips on preventing diabetes

Eat healthy foods: more vegetables and fruits, less carbohydrates, fats, sugars and salts;

Exercise regularly:

At least 30 minutes of brisk walking every day will do you good.

Take the stairs not the lift.

Walk short distances; don't board a vehicle

Encourage children to have daily physical exercises.

Avoid smoking, if a smoker seeks assistance to quit smoking;

Avoid harmful use of alcohol: excessive use of alcohol is dangerous to health;

It's good to know you are healthy; Visit your nearest health facility for checkups for diabetes and blood pressure.

Early diagnosis and proper treatment prevents complications of diabetes;

DON'T wait until you are feeling unwell;

Check your Body Mass Index (BMI):

This is the ration of Weight in Kg/height in Meters² For example:

if your weight is 75kg and height is 154cm

$BMI = 75 / (1.54)^2 = 75 / 2.3716 = 31.6$

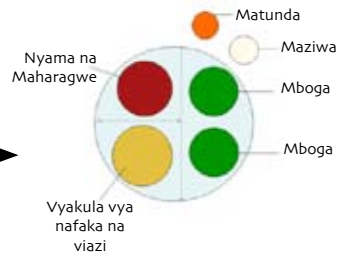
Less than 18.5	18.5-24.9	25-29.9	30+ above
Underweight	Normal	Overweight	Obese

HATUA ZA KUZUIA UGONJWA WA KISUKARI

1. Kula chakula bora ambacho kina mafuta kidogo, kiasi kidogo cha sukari. Chakula kiwe na matunda na mboga nyingi.

2. Panga kiasi cha chakula unachokula. Jambo hili ni muhimu katika kudhibiti kiasi cha sukari katika damu yako.

3. Fanya mazoezi kila mara. Kwa mfano; kutembea, kulima, kuendesha baiskeli, michezo na mazoezi mengine yoyote. Mazoezi husaidia kupunguza kiasi cha sukari katika damu yako.



4. Pima kiasi cha sukari katika damu yako angalau mara moja kwa miezi sita au mwaka.

5. Jiepushe na pombe.

6. Jiepushe na sigara au tumbaku



Myths and Misconceptions About Diabetes

The following are some of the misconceptions and myths regarding diabetes in Kenya;

Myth: Diabetes is a disease of the rich

Fact: Diabetes knows no boundaries and affects all the people across the board.

Myth: Diabetes is the result of eating too much sugar

Fact: Diabetes is as a result of lack of insulin that is essential for the control of blood sugar in the body. However, taking too much sugar may lead to obesity and overweight that are risk factors for developing diabetes.

Myth: Only older people get diabetes

Fact: Diabetes knows no boundaries and affects all the people across the board. Despite older people being at a higher risk of developing diabetes, younger people also need to take precaution.

Myth: Diabetes gets cured after a while

Fact: Diabetes results from gradual damage to the cells producing insulin in the body. The damaged cells cannot be brought back to life. Once an individual develops diabetes, he/she shall need lifelong treatment that ranges from diet, exercises and or with drugs.

Myth: If you look fat/obese you are healthy despite having diabetes

Fact: Obesity/overweight is a predisposing factor for diabetes. To avoid developing diabetes, you should maintain a healthy weight.

Myth: Diabetes is the result of a curses/witchcraft

Fact: Diabetes is as a result of lack of insulin that is essential for the control of blood sugar in the body.

Myth: Diabetes is cured through prayers since it is brought on by evil spirits

Fact: Diabetes is as a result of lack of insulin that is essential for the control of blood sugar in the body. Spiritual support enhances good control of blood sugar.

Myth: Traditional healers can cure diabetes using nutritional and herbal supplements

Fact: Diabetes results from gradual damage to the cells producing insulin in the body. Diabetes has no cure and can only be controlled by a combination of diet, exercises or drugs.

Myth: Alternative therapy preferred over scientific therapy.

Fact: Diabetes results from gradual damage to the cells producing insulin in the body. Diabetes has no cure and can only be controlled by a combination of diet, exercises or drugs.

Myth: Having diabetes means eating different foods from others.

Fact: People with diabetes don't need to follow a restricted diet but instead should follow the same healthy eating guidelines as every person in the community which can be provided by a nutritionist in your local health facility.



1 Kudhibiti kiwango cha sukari katika damu



2 Kujihisi vyema/vizuri



3 Uzito ufaao

4 Matatizo machache ya kiafya

MASWALA MUHIMU KUHUSU UGONJWA WA KISUKARI

- Kula mkate uliopikwa kwa unga usiokobolewa na nafaka kwa nadra/uangalifu
- Usile sukari au vyakula vilivyoongezwa sukari
- Kunywa maji kwa wingi



Kula matunda na mboga



Usile mafuta mengi



Chungwa



Mkate



Embe



Ndizi



Papai



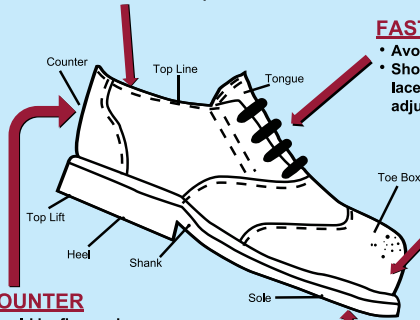
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APPROPRIATE FOOT WEAR FOR PEOPLE LIVING WITH DIABETES

TOP LINE/COLLAR

Should be soft and well padded



FASTENING

- Avoid slip on shoes
- Should be fastened with laces or velcro to allow for adjustment.

TOE BOX

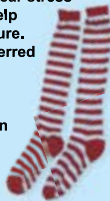
Rounded and high to properly secure the toes.

COUNTER

Should be firm and high to secure the foot

SOCKS

- Soft socks reduce shear stress
- Soft padded socks help reduce plantar pressure.
- Seamless socks preferred over seamed ones
- Should be made of absorbent material. Should not be tight on the foot



SOLE

- Firm enough to stabilize the foot
- Rigid soles to absorb shock & reduce vertical pressure.
- Tough to prevent injuries from sharp objects.
- Serrated – smooth outsoles are slippery.
- Heel not higher than 2 inches

INSOLES

- Cushioning made from soft material.
- Shock absorbing.



Ministry of Public Health
and Sanitation
Kenya



Kenya Diabetes Management & Information Centre



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