# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Date: 07/06/2019

From
Dr. Aravind. C
Professor and Head,
Department of General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

**Sub: Permission to conduct value-added course: DIABETES AND DIETARY PRACTICES**

Respected Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: DIABETES AND DIETARY PRACTICES on 05/07/2019. We solicit your kind permission for the same.

Kind Regards

Dr. Aravind. C

Dr. C. ARAVIND, MD., Reg.No:68432 Professor & HOD, General Medicine Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Kudapakkam, Puducherry

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. Aravind. C

The Expert: Dr. Venkatasamy

The committee has discussed about the course and is approved.

Dean

Subject Expert

HOD

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D., DEAN Sri Lakshmi Narayana Institute of Medical Sciences Osudu, Ageram Kudapakkam, Post, Villanur Commune Puducherry-605 502.

Dr. C. ARAVIND, MD., Reg.No:68432 Professor & HOD, General Medicine

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.

[ Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME ( P -II ) dt. 11/07/2011 ]
[ Affiliated to Bharath University, Chennai - TN ]

## Circular

11/06/2019

**Sub: Organising Value-added Course: DIABETES AND DIETARY PRACTICES reg**

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research**, is organising a Value added course, titled, "DIABETES AND DIETARY PRACTICES" between July 2019 and December 2019. The course content is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 26/06/2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Dr. G. JAYALAKSHMI, BSC.,MBBS.,DTCD.,M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Ageram Kudapakkam, Post,
Villanur Commune Puducherry-605 502.

Encl: Copy of Course content

# COURSE PROPOSAL

**Course Title:** **DIABETES AND DIETARY PRACTICES**

**Course Objective: To create an awareness among students of the 2nd year M.B.B.S about the role played by nutritional therapy in diabetes- both primary and secondary prevention**

**Course Outcome: An awareness regarding the importance of diet in diabetes- disease progression and treatment and the appropriate healthy diabetic diet were generated in the minds of all the participants**

**Course Audience: A batch of 25 students belonging to the 2nd year of M.B.B.S**

**Course Coordinator: Dr. C. Aravind**

**Course Faculties with Qualification and Designation:**

1. **Dr. Venkatasamy**
   **Professor**
   **Department of Medicine**

2. **Dr. Muthukumarasamy**
   **Professor**
   **Department of Medicine**

**Course Curriculum/Topics with schedule :**

| SlNo | Date | Topic | Time | Hours | Name od the Instructor |
|---|---|---|---|---|---|
| 1. | 05/07/2019 | What is diabetes? | 5 pm to 7 pm | 2 hours | Dr. Venkatasamy |
| 2. | 12/07/2019 | Epidemiology | 4: 30 pm to 6: 30 pm | 2 hours | Dr. Venkatasamy |
| 3. | 19/07/2019 | Symptomatology | 5 pm to 7 pm | 2 hours | Dr. Muthukumarasamy |
| 4. | 02/08/2019 | WHOM TO SCREEN? | 5 pm to 7 pm | 2 hours | Dr. Venkatasamy |
| 5. | 09/08/2019 | Etiopathogenesis | 5 pm to 7 pm | 2 hours | Dr. Muthukumarasamy |
| 6. | 16/08/2019 | Modifiable and | 4: 30 | 2 hours | Dr. |

| | | | | | |
|---|---|---|---|---|---|
| | | non- modifiable risk factors | pm to 6: 30 pm | | Muthukumarasamy |
| 7. | 23/08/2019 | Can certain diets predispose to developing DM? | 5 pm to 7 pm | 2 hours | Dr. Muthukumarasamy |
| 8. | 06/09/2019 | Can natural foods, alternate medicine cure DM? | 5 pm to 7 pm | 2 hours | Dr. Venkatasamy |
| 9. | 13/09/2019 | Rice based diet – and its implications | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy |
| 10. | 20/09/2019 | Medical nutrition therapy | 4 pm to 6 pm | 2 hours | Dr. Venkatasamy |
| 11. | 04/10/2019 | Daily meal plan, diary and calender | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy |
| 12. | 18/10/2019 | Calorie distribution of foods | 4 pm to 6 pm | 2 hours | Dr. Venkatasamy |
| 13. | 25/10/2019 | What fats should we forsake? | 4 pm to 6 pm | 2 hours | Dr. Muthukumarasamy |
| 14. | 01/11/2019 | Proteins and Diabetes | 4 pm to 6 pm | 2 hours | Dr. Venkatasamy |
| 15. | 08/11/2019 | Diet and slowing of disease progression | 4 pm to 6 pm | 2 hours | Dr. Venkatasamy |
| | | | Total Hours | 30 | Dr. Muthukumarasamy |

**REFERENCE BOOKS:**


1. **HARRISON'S PRINCIPLES OF INTERNAL MEDICINE; 18th EDITION**
2. **WILLIAM'S TEXTBOOK OF ENDOCRINOLOGY**

# VALUE ADDED COURSE

1. Name of the programme and code

   Diabetes and dietary practices; IM11

2. Duration & period

   30 hrs; between July 2019 – November 2019

3. Information Brochure and course content of value-added courses

   Enclosed as Annexure – I

4. List of students enrolled

   Enclosed as Annexure – II

5. Assessment procedures:

   Short notes – Enclosed as Annexure – III

6. Certificate model

   Enclosed as Annexure – IV

7. No. of times offered during the same year

   1; July 2019 – November 2019

8. Year of discontinuation

   2020

9. Summary report of each program year wise:

| VALUE ADDED COURSE: July 2019 – November 2019 | | | | | |
|---|---|---|---|---|---|
| Sl. No. | Course code | Course name | Resource persons | Target Students | Strength and year |
| 1 | IM11 | Diabetics and dietary practices | Dr. Venkatasamy | 2nd year MBBS | 25 (July 2019 – November 2019) |

10. Course feedback

    Enclosed as Annexure - V

**RESOURCE PERSON- Dr.Venkatasamy**

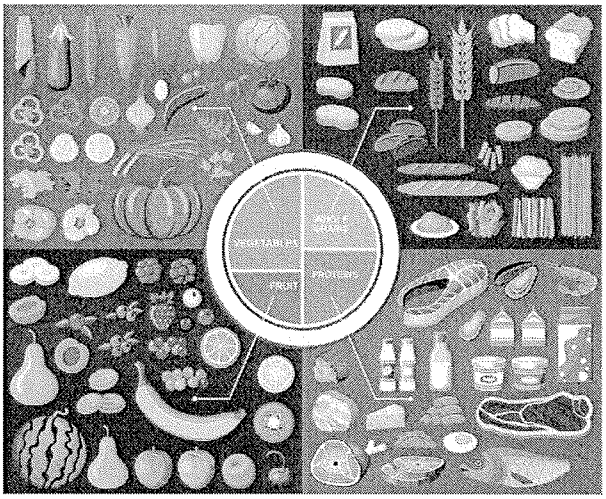
**COORDINATOR – Dr. C. Aravind**

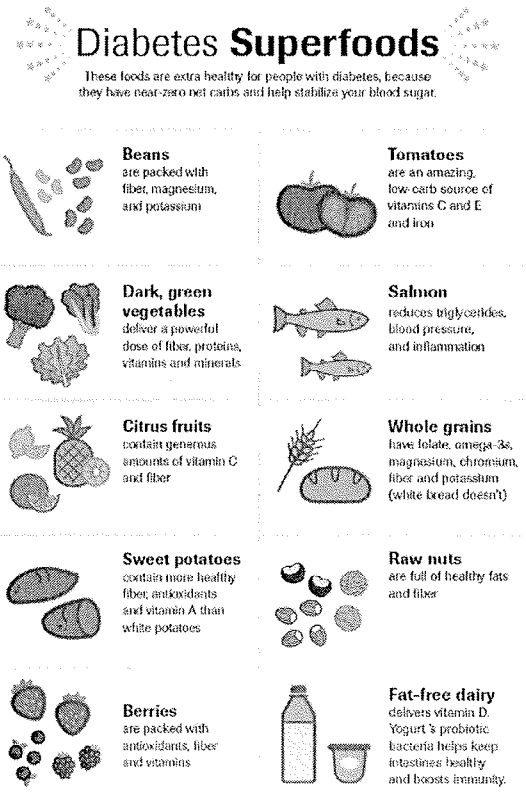
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Puducherry-605 502.

# ANNEXURE - I

# PARTICIPANT HANDBOOK

## DIABETES AND DIETARY PRACTICES





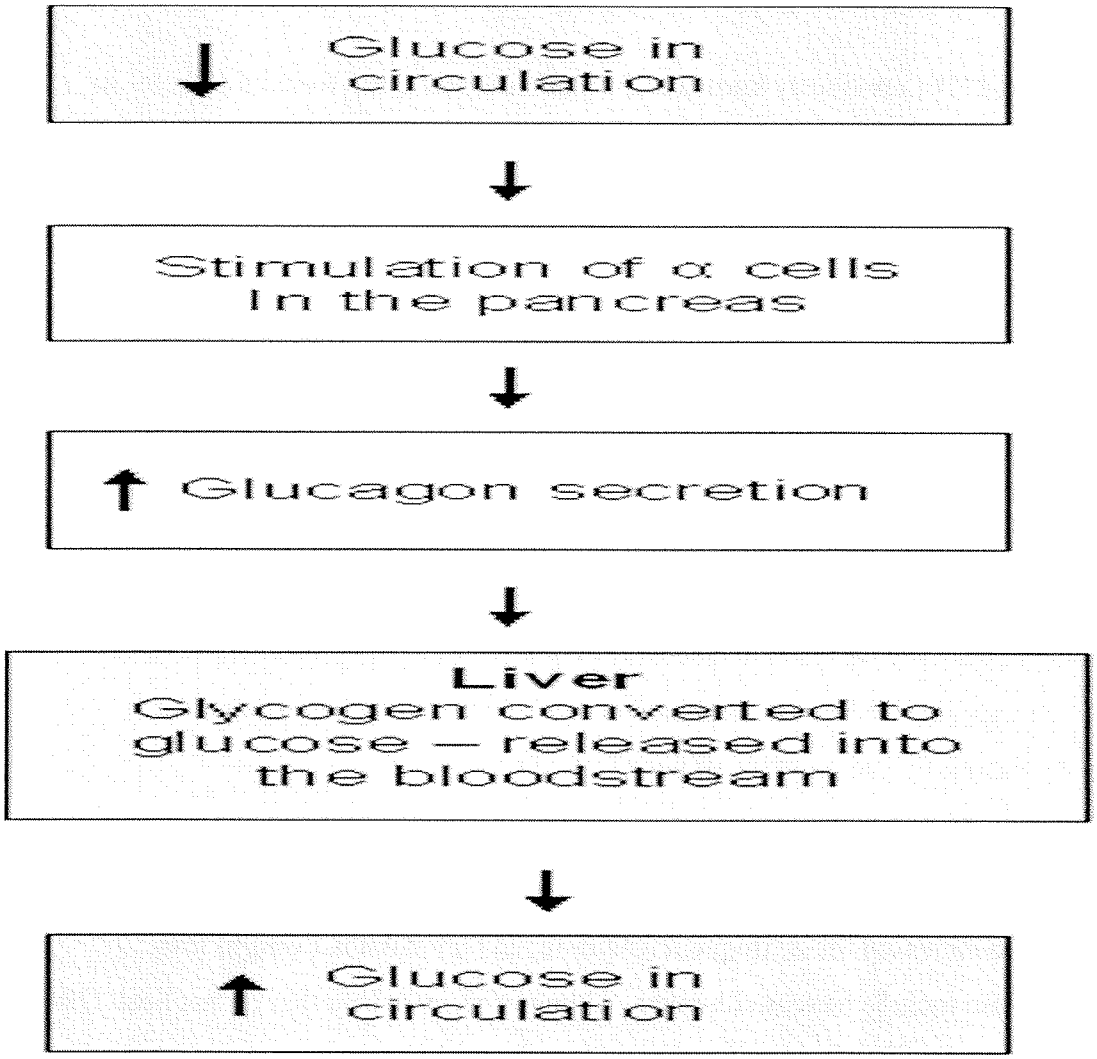
## COURSE DETAILS

| PARTICULARS | DESCRIPTION |
|---|---|
| Course title | DIABETES AND DIETARY PRACTICES |
| Course code | IM11 |
| Objective | 1. What is diabetes?<br>2. Epidemiology<br>3. Symptomatology<br>4. WHOM TO SCREEN?<br>5. Etiopathogenesis<br>6. Modifiable and non- modifiable risk factors<br>7. Can certain diets predispose to developing DM?<br>8. Can natural foods, alternate medicine cure DM?<br>9. Rice based diet – and its implications<br>10. Medical nutrition therapy<br>11. Daily meal plan, diary and calender<br>12. Calorie distribution of foods<br>13. What fats should we forsake?<br>14. Proteins and Diabetes<br>15. Diet and slowing of disease progression |
| Key competencies | On successful completion of the course, the students will have a better knowledge about the preferred diet in the primary and secondary prevention of diabetes |
| Target students | 2nd year MBBS |
| Duration | 30 hours; between July 2019 and November 2019 |
| Assessment procedure | Short notes |

## DIABETES & DIETARY PRACTICES

GLUCOSE METABOLISM

Body cells require glucose (sugar) as a fuel for producing energy. After digestion, food changes to glucose. Glucose through blood reaches to cells. Insulin, a hormone, is a key which makes the body cells door to allow glucose to enter. In absence of enough insulin, glucose level in blood increases.




## DIABETES MELLITUS

**Diabetes mellitus** (**DM**), commonly known as **diabetes**, is a group of metabolic disorders characterized by a high blood sugar level over a prolonged period of time. Symptoms often include frequent urination, increased thirst, and increased appetite. If left untreated, diabetes can cause many complications. Acute complications can include diabetic ketoacidosis, hyperosmolar hyperglycemic state, or death. Serious long-term complications include cardiovascular disease, stroke, chronic kidney disease, foot ulcers, damage to the nerves, damage to the eyes and cognitive impairment.

Diabetes is due to either the pancreas not producing enough insulin, or the cells of the body not responding properly to the insulin produced. There are three main types of diabetes mellitus

**Type 1 diabetes** (**T1D**), previously known as **juvenile diabetes**, is a form of diabetes in which very little or no insulin is produced by the islets of Langerhans in the pancreas. Insulin is a hormone required for the body to use blood sugar. Before treatment this results in high blood sugar levels in the body. The classic symptoms are frequent urination, increased thirst, increased hunger, and weight loss. Additional symptoms may include blurry vision, tiredness, and poor wound healing. Symptoms typically develop over a short period of time, often a matter of weeks.

The cause of type 1 diabetes is unknown, but it is believed to involve a combination of genetic and environmental factors. Risk factors include having a family member with the condition. The underlying mechanism involves an autoimmune destruction of the insulin producing beta cells in the pancreas. Diabetes is diagnosed by testing the level of sugar or glycated hemoglobin (HbA1C) in the blood. Type 1 diabetes can be distinguished from type 2 by testing for the presence of autoantibodies.

**Type 2 diabetes** (**T2D**), formerly known as **adult-onset diabetes**, is a form of diabetes that is characterized by high blood sugar, insulin resistance, and relative lack of insulin. Common symptoms include increased thirst, frequent urination, and unexplained weight loss. Symptoms may also include increased hunger, feeling tired, and sores that do not heal. Often symptoms come on slowly. Long-term complications from high blood sugar include heart disease, strokes, diabetic retinopathy which can result in blindness, kidney failure, and poor blood flow in the limbs which may lead to amputations. The sudden onset of hyperosmolar hyperglycemic state may occur; however, ketoacidosis is uncommon.

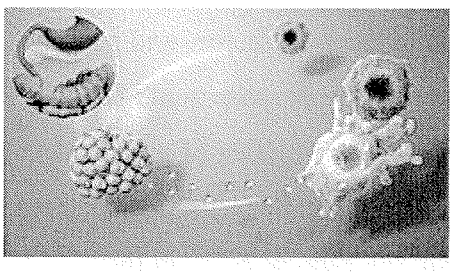
Type 2 diabetes primarily occurs as a result of obesity and lack of exercise.

**ETIOLOGY**

## TYPE 1 DIABETES

Type 1 diabetes is characterized by loss of the insulin-producing beta cells of the pancreatic islets, leading to insulin deficiency. This type can be further classified as immune-mediated or idiopathic. The majority of type 1 diabetes is of the immune-mediated nature, in which a T cell-mediated autoimmune attack leads to the loss of beta cells and thus insulin. It causes approximately 10% of diabetes mellitus cases in North America and Europe. Most affected people are otherwise healthy and of a healthy weight when onset occurs. Sensitivity and responsiveness to insulin are usually normal, especially in the early stages. Although it has been called "juvenile diabetes" due to the frequent onset in children, the majority of individuals living with type 1 diabetes are now adults.

"Brittle" diabetes, also known as unstable diabetes or labile diabetes, is a term that was traditionally used to describe the dramatic and recurrent swings in glucose levels, often occurring for no apparent reason in insulin-dependent diabetes. This term, however, has no biologic basis and should not be used. Still, type 1 diabetes can be accompanied by irregular and unpredictable high blood sugar levels, and the potential for diabetic ketoacidosis or serious low blood sugar levels. Other complications include an impaired counterregulatory response to low blood sugar, infection, gastroparesis (which leads to erratic absorption of dietary carbohydrates), and endocrinopathies (e.g., Addison's disease). These phenomena are believed to occur no more frequently than in 1% to 2% of persons with type 1 diabetes.



Type 1 diabetes is partly inherited, with multiple genes, including certain HLA genotypes, known to influence the risk of diabetes. In genetically susceptible people, the onset of diabetes can be triggered by one or more environmental factors, such as a viral infection or diet. Several viruses have been implicated, but to date there is no stringent evidence to support this hypothesis in humans. Among dietary factors, data suggest that gliadin (a protein present in gluten) may play a role in the development of type 1 diabetes, but the mechanism is not fully understood.

Type 1 diabetes can occur at any age, and a significant proportion is diagnosed during adulthood. Latent autoimmune diabetes of adults (LADA) is the diagnostic term applied when type 1 diabetes develops in adults; it has a slower onset than the same condition in children. Given this difference, some use the unofficial term "type 1.5 diabetes" for this condition. Adults with LADA are frequently initially misdiagnosed as having type 2 diabetes, based on age rather than cause.

## TYPE 2 DIABETES

Type 2 diabetes is characterized by insulin resistance, which may be combined with relatively reduced insulin secretion. The defective responsiveness of body tissues to insulin is believed to involve the insulin receptor. However, the specific defects are not known. Diabetes mellitus cases due to a known defect are classified separately. Type 2 diabetes is the most common type of diabetes mellitus. Many people with type 2 diabetes have evidence of prediabetes (impaired fasting glucose and/or impaired glucose tolerance) before meeting the criteria for type 2 diabetes. The progression of prediabetes to overt type 2 diabetes can be slowed or reversed by lifestyle changes or medications that improve insulin sensitivity or reduce the liver's glucose production.

Type 2 diabetes is primarily due to lifestyle factors and genetics. A number of lifestyle factors are known to be important to the development of type 2 diabetes, including obesity (defined by a body mass index of greater than 30), lack of physical activity, poor diet, stress, and urbanization. Excess body fat is associated with 30% of cases in people of Chinese and Japanese descent, 60–80% of cases in those of European and African descent, and 100% of Pima Indians and Pacific Islanders. Even those who are not obese may have a high waist–hip ratio.

Dietary factors such as sugar-sweetened drinks are associated with an increased risk. The type of fats in the diet is also important, with saturated fat and trans fats increasing the risk and polyunsaturated and monounsaturated fat decreasing the risk. Eating white rice excessively may increase the risk of diabetes, especially in Chinese and Japanese people. Lack of physical activity may increase the risk of diabetes in some people.

## DO DIETARY HABITS PREDISPOSE TO DIABETES??

The role of diet in the etiology of T2DM was proposed by Indians as mentioned earlier, who observed that the disease was almost confined to rich people who consumed oil, flour, and sugar in excessive amounts. During the First and Second World Wars, declines in the diabetes mortality rates were documented due to food shortage and famines in the involved countries such as Germany and other European countries. In Berlin, diabetes mortality rate declined from 23.1/100,000 in 1914 to 10.9 in 1919. In contrast, there was no change in diabetes mortality rate in other countries with no shortage of food at the same time period such as Japan and North American countries. Whereas few studies have found strong association of T2DM with high intake of carbohydrates and fats. Many studies have reported a positive association between high intake of sugars and development of T2DM. In a study, Ludwig investigated more than 500 ethnically diverse schoolchildren for 19 months. It was found that for each additional serving of carbonated drinks consumed, frequency of obesity increased, after adjusting for different parameters such as dietary, demographic, anthropometric, and lifestyle.

A study was conducted which included the diabetic patients with differing degrees of glycemic control. There were no differences in the mean daily plasma glucose levels or diurnal glucose profiles. As with carbohydrates, the association between dietary fats and T2DM was also inconsistent.34 Many of prospective studies have found relations between fat intake and subsequent risk of developing T2DM. In a diabetes study, conducted at San Louis Valley, a more than thousand subjects without a prior diagnosis of diabetes were prospectively investigated for 4 years. In that study, the researchers found an association between fat intake, T2DM and impaired glucose tolerance Another study observed the relationship of the various diet components among two groups of women, including fat, fiber plus sucrose, and the risk of T2DM. After adjustment, no associations were found between intakes of fat, sucrose, carbohydrate or fiber and risk of diabetes in both groups.

Recently, evidence suggested a link between the intake of soft drinks with obesity and diabetes, resulting from large amounts of high fructose corn syrup used in the manufacturing of soft drinks, which raises blood glucose levels and BMI to the dangerous levels. It was also stated by Assy that diet soft drinks contain glycated chemicals that markedly augment insulin resistance. Food intake has been strongly linked with obesity, not only related to the volume of food but also in terms of the composition and quality of diet. High intake of red meat, sweets and fried foods, contribute to the increased the risk of insulin resistance and T2DM. In contrast, an inverse correlation was observed between intake of vegetables and T2DM. Consumption of fruits and vegetables may protect the development of T2DM, as they are rich in nutrients, fiber and antioxidants which are considered as protective barrier against the diseases. Recently, in Japanese women, a report revealed that elevated intake of white rice was associated with an increased risk of T2DM. This demands an urgent need for changing lifestyle among general population and further increase the awareness of healthy diet patterns in all groups.

## DIAGNOSIS OF DIABETES

Diabetes mellitus is characterized by recurrent or persistent high blood sugar, and is diagnosed by demonstrating any one of the following:

- Fasting plasma glucose level $\geq$ 7.0 mmol/L (126 mg/dL)
- Plasma glucose $\geq$ 11.1 mmol/L (200 mg/dL) two hours after a 75 gram oral glucose load as in a glucose tolerance test (OGTT)
- Symptoms of high blood sugar and casual plasma glucose $\geq$ 11.1 mmol/L (200 mg/dL)
- Glycated hemoglobin ($HbA_{1C}$) $\geq$ 48 mmol/mol ($\geq$ 6.5 DCCT %).

A positive result, in the absence of unequivocal high blood sugar, should be confirmed by a repeat of any of the above methods on a different day. It is preferable to measure a fasting glucose level because of the ease of measurement and the considerable time commitment of formal glucose tolerance testing, which takes two hours to complete and offers no prognostic advantage over the fasting test. According to the current definition, two fasting glucose measurements above 7.0 mmol/L (126 mg/dL) is considered diagnostic for diabetes mellitus.

Per the WHO, people with fasting glucose levels from 6.1 to 6.9 mmol/L (110 to 125 mg/dL) are considered to have impaired fasting glucose. People with plasma glucose at or above

7.8 mmol/L (140 mg/dL), but not over 11.1 mmol/L (200 mg/dL), two hours after a 75 gram oral glucose load are considered to have impaired glucose tolerance. Of these two prediabetic states, the latter in particular is a major risk factor for progression to full-blown diabetes mellitus, as well as cardiovascular disease. The American Diabetes Association (ADA) since 2003 uses a slightly different range for impaired fasting glucose of 5.6 to 6.9 mmol/L (100 to 125 mg/dL).

## TREATMENT PLAN: MNT

Diabetes management concentrates on keeping blood sugar levels as close to normal, without causing low blood sugar. This can usually be accomplished with dietary changes, exercise, weight loss, and use of appropriate medications (insulin, oral medications).

Learning about the disease and actively participating in the treatment is important, since complications are far less common and less severe in people who have well-managed blood sugar levels. Per the American College of Physicians, the goal of treatment is an $HbA_{1C}$ level of 7-8%. Attention is also paid to other health problems that may accelerate the negative effects of diabetes. These include smoking, high blood pressure, metabolic syndrome obesity, and lack of regular exercise. Specialized footwear is widely used to reduce the risk of ulcers in at-risk diabetic feet although evidence for the efficacy of this remains equivocal.

### Lifestyle

People with diabetes can benefit from education about the disease and treatment, dietary changes, and exercise, with the goal of keeping both short-term and long-term blood glucose levels within acceptable bounds. In addition, given the associated higher risks of cardiovascular disease, lifestyle modifications are recommended to control blood pressure.

Weight loss can prevent progression from prediabetes to diabetes type 2, decrease the risk of cardiovascular disease, or result in a partial remission in people with diabetes. No single dietary pattern is best for all people with diabetes. Healthy dietary patterns, such as the Mediterranean diet, low-carbohydrate diet, or DASH diet, are often recommended, although evidence does not support one over the others. According to the ADA, "reducing overall carbohydrate intake for individuals with diabetes has demonstrated the most evidence for improving glycemia", and for individuals with type 2 diabetes who cannot meet the glycemic targets or where reducing anti-glycemic medications is a priority, low or very-low

carbohydrate diets are a viable approach. For overweight people with type 2 diabetes, any diet that achieves weight loss is effective. Implementing a plant-based diet may help manage or prevent type-2 diabetes by lowering glycated hemoglobin levels. In addition, improvement in health may reduce the need for or number of medications needed by people who adopt a plant-based diet.

**Medications**

*Glucose control*

Most medications used to treat diabetes act by lowering blood sugar levels through different mechanisms. There is broad consensus that when people with diabetes maintain tight glucose control – keeping the glucose levels in their blood within normal ranges – they experience fewer complications, such as kidney problems or eye problems There is however debate as to whether this is appropriate and cost effective for people later in life in whom the risk of hypoglycemia may be more significant.

There are a number of different classes of anti-diabetic medications. Type 1 diabetes requires treatment with insulin, ideally using a "basal bolus" regimen that most closely matches normal insulin release: long-acting insulin for the basal rate and short-acting insulin with meals. Type 2 diabetes is generally taken with medication that is taken by mouth (e.g. metformin) although some eventually require injectable treatment with insulin or GLP-1 agonists.

Metformin is generally recommended as a first-line treatment for type 2 diabetes, as there is good evidence that it decreases mortality. It works by decreasing the liver's production of glucose. Several other groups of drugs, mostly given by mouth, may also decrease blood sugar in type 2 diabetes. These include agents that increase insulin release (sulfonylureas), agents that decrease absorption of sugar from the intestines (acarbose), agents that inhibit the enzyme dipeptidyl peptidase-4 (DPP-4) that inactivates incretins such as GLP-1 and GIP (sitagliptin), agents that make the body more sensitive to insulin (thiazolidinedione) and agents that increase the excretion of glucose in the urine (SGLT2 inhibitors). When insulin is used in type 2 diabetes, a long-acting formulation is usually added initially, while continuing oral medications.[8] Doses of insulin are then increased until glucose targets are reached.[8][107]

*Blood pressure lowering*

Cardiovascular disease is a serious complication associated with diabetes, and many international guidelines recommend blood pressure treatment targets that are lower than

140/90 mmHg for people with diabetes. However, there is only limited evidence regarding what the lower targets should be. A 2016 systematic review found potential harm to treating to targets lower than 140 mmHg, and a subsequent systematic review in 2019 found no evidence of additional benefit from blood pressure lowering to between 130 - 140mmHg, although there was an increased risk of adverse events.

2015 American Diabetes Association recommendations are that people with diabetes and albuminuria should receive an inhibitor of the renin-angiotensin system to reduce the risks of progression to end-stage renal disease, cardiovascular events, and death. There is some evidence that angiotensin converting enzyme inhibitors (ACEIs) are superior to other inhibitors of the renin-angiotensin system such as angiotensin receptor blockers (ARBs), or aliskiren in preventing cardiovascular disease. Although a more recent review found similar effects of ACEIs and ARBs on major cardiovascular and renal outcomes. There is no evidence that combining ACEIs and ARBs provides additional benefits.

*Aspirin*

The use of aspirin to prevent cardiovascular disease in diabetes is controversial. Aspirin is recommended by some in people at high risk of cardiovascular disease, however routine use of aspirin has not been found to improve outcomes in uncomplicated diabetes. 2015 American Diabetes Association recommendations for aspirin use (based on expert consensus or clinical experience) are that low-dose aspirin use is reasonable in adults with diabetes who are at intermediate risk of cardiovascular disease (10-year cardiovascular disease risk, 5–10%). National guidelines for England and Wales by the National Institute for Health and Care Excellence (NICE) recommend against the use of aspirin in people with type 1 or type 2 diabetes who do not have confirmed cardiovascular disease.

**Surgery**

Weight loss surgery in those with obesity and type 2 diabetes is often an effective measure. Many are able to maintain normal blood sugar levels with little or no medications following surgery and long-term mortality is decreased. There is, however, a short-term mortality risk of less than 1% from the surgery. The body mass index cutoffs for when surgery is appropriate are not yet clear. It is recommended that this option be considered in those who are unable to get both their weight and blood sugar under control.

A pancreas transplant is occasionally considered for people with type 1 diabetes who have severe complications of their disease, including end stage kidney disease requiring kidney transplantation.

### Support

In countries using a general practitioner system, such as the United Kingdom, care may take place mainly outside hospitals, with hospital-based specialist care used only in case of complications, difficult blood sugar control, or research projects. In other circumstances, general practitioners and specialists share care in a team approach. Home telehealth support can be an effective management technique

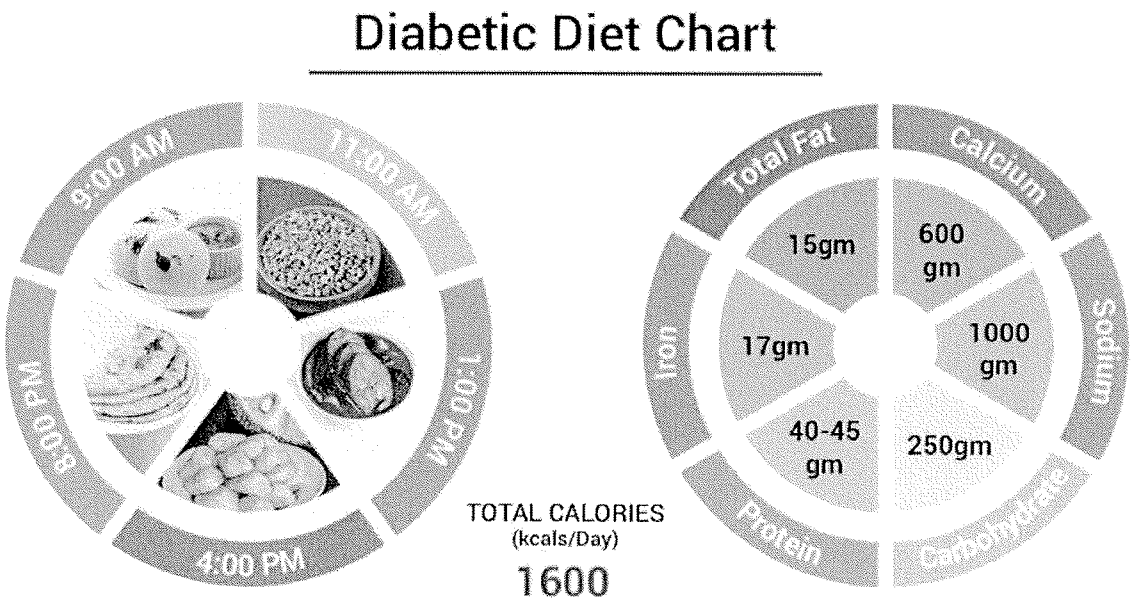
## DIETARY APPROACHES TO A PATIENT WITH DIABTES

Diabetic's dietary practices are mainly influenced by cultural backgrounds. Concerning each of the dimensions of dietary practices, there were significant positive relationships between knowledge regarding diabetic diet and dietary practices. Knowledge was a salient factor related to dietary behaviors control. Moreover, patients' knowledge on a recommended diet indicates their understanding of dietary guidelines which influenced their food selection and eating patterns.

The association between dietary knowledge and dietary practices among T2DM patients in the previous studies were inconsistent. Another study revealed that there was no relationship between dietary knowledge and compliance of dietary practices.58 On the other hand, the same study found that a high dietary knowledge score was associated with following dietary recommendations and knowledgeable patients performed self-management activities in a better way. Dietary knowledge significantly influences dietary practices. In Indonesia, a study was conducted to measure dietary practices among diabetic patients, which elaborated that the Indonesian people, preferred to consume high-fat foods which lead to an increased risk of CVD.59 The trend of skipping breakfast has dramatically increased over the past 10 years in children, adolescents, and adults. There is increasing evidence that skipping breakfast is related with overweight and other health issues.

In addition, frequent eating or snacking may also increase the body weight and risk of metabolic diseases. Rimm demarcated western and prudent dietary patterns. The prudent

dietary pattern was characterized by increased consumption of fish, poultry, various vegetables and fruits whereas; the western dietary pattern was characterized by an increased consumption of processed and red meat, chips, dairy products, refined grains, and sweets and desserts. These patterns were previously associated with T2DM risk. The glycemic index is an indicator of the postprandial blood glucose response to food per gram of carbohydrate compared with a reference food such as white bread or glucose. Hence, the glycemic load represents both the quality and quantity of the carbohydrates consumed. Another study conducted in Lebanon demonstrated direct correlation of the refined grains and desserts and fast food patterns with T2DM, however, in the same study an inverse correlation was observed between the traditional food pattern and T2DM among Lebanese adults.



## Annexure – II

## LIST OF STUDENTS ENROLLED WITH SIGNATURES

**Bharath Institute of Higher Education and Research**

Sri Lakshmi Narayana Institute of Medical Sciences

Participant list with signatures

Value added course: **DIABETES AND DIETARY PRACTICES (dated 05/07/2019)**

| Sl.No | Reg.No | Name of the candidate | Signature |
|---|---|---|---|
| 1. | U17MB251 | AANNIE SHERLINE RAJAM.L | |
| 2. | U17MB252 | AARTHISEKAR . D | |
| 3. | U17MB253 | AARYA R BABU | |
| 4. | U17MB254 | ABHIJITH.K | |
| 5. | U17MB255 | ABHISHEIK.J | |
| 6. | U17MB256 | ABHISHEK KUMAR VISHWAKARMA | |
| 7. | U17MB257 | ADITYA RAI | |
| 8. | U17MB258 | ADWIZA RAI | |
| 9. | U17MB259 | AFZAN.M | |
| 10. | U17MB260 | AGARWAL RIDHAM RAJESHBHAI | |
| 11. | U17MB261 | AISWARYA.S.NAIR | |
| 12. | U17MB262 | AKANKSHA CHOURASIA | |
| 13. | U17MB263 | AKASH KELOTH | |
| 14. | U17MB264 | ALLUVALA ABHILASH | |
| 15. | U17MB265 | AMIRTHA RAJENDRA SUVETHAN D | |
| 16. | U17MB281 | BHAVYA GUPTA | |
| 17. | U17MB282 | BRAHMA PRAKASH MISHRA | |
| 18. | U17MB283 | CHINMAY DODANI | |
| 19. | U17MB284 | CHRISTO VINCENT.V | |
| 20. | U17MB285 | CIBIYASHREE.G | |
| 21. | U17MB286 | DEBIA JERMIN | |
| 22. | U17MB287 | DEEPIKAA R.D | |

| | | | |
|---|---|---|---|
| 23. | U17MB288 | DHANUSS BHUVAN SRIDARAN | |
| 24. | U17MB289 | DHIREN.S | |
| 25. | U17MB290 | DHWANI SOLANKI | |

Annexure - III

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

## DIABETES AND DIETARY PRACTICES

## SHORT NOTES

**Course Code: IM11**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Diabetic diet
2. Medical nutrition therapy for diabetes
3. Metabolic syndrome and diabetes
4. Effect of diet on the disease progression among diabetics

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Annexure III**

## DIABETES AND DIET

## SHORT NOTES

Student Name:

ALLUVALA ABHILASH

**Course Code: IM11**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Diabetic diet
2. Medical nutrition therapy for diabetes
3. Metabolic syndrome and diabetes
4. Effect of diet on the disease progression among diabetics

10

10

Needs improvement

1) Diabetic diet :- vegetables → nonstarchy includes broccoli, carrot, greens, peppers and tomatoes.

fruits - includes oranges, melon, berries, apples, ~~ban~~

protein.

dairy - non fat or low fat

2

2) medical nutrition therapy for diabetes :- ① Maintenance of as near normal BG levels as possible, by balancing food, medication and physical activity.

- Achievement of optimal serum lipid levels,
- provision of adequate calories for maintaining reasonable weight in adults, normal or attaining growth / development in children and adolescents.

3

3) Metabolic Syndrome :- visceral obesity, Low HDL-cholesterol, High triglycerides, Insulin resistance, Hypertension.

2 Diabetes :- Lack of Insulin production, Insulin resistance

genes and family History, DM, Age, obesity, poor diet, lack of Exercise.

4) • control Blood sugar level

• consumes dietary food, -1-

• take tablet. metformin 500mg TDS.

• If not subsided, then insulin therapy is started, if severe

2.

# SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

**Annexure III**

## DIABETES AND DIET

## SHORT NOTES

Student Name:

AKASH KELOTH

**Course Code: IM11**

**WRITE SHORT NOTES ON THE FOLLOWING:**

1. Diabetic diet
2. Medical nutrition therapy for diabetes
3. Metabolic syndrome and diabetes
4. Effect of diet on the disease progression among diabetics

① Diabetic diet is a healthy diet that is normally rich in nutrients & low in fat & calories.

② MNT – Nutrition based treatment provided by a Registered dietitian nutritionist. It includes nutrition diagnosis as well as therapeutic & counselling to help manage diabetes.

③ Metabolic syndrome – cluster of condition that occurs together, increasing risk of heart disease, stroke, Type 2 diabetes. Condition – HTN, Hyperglycemia, Obesity, dyslipedimea

④ Improvement in elevated HbA1c level achieved through diet management; then patient could be prevented from developing diabete complication

ANNEXURE IV

# Sri Lakshmi Narayana Institute of Medical Sciences

## CERTIFICATE OF MERIT

This is to certify that ABHIJITH.K has actively participated in the Value Added Course on "Diabetes and Dietary Practices" conducted between July 2019-November 2019, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Venkatasamy
**RESOURCE PERSON**

Dr. C. Aravind
**COORDINATOR**

Dr. C. ARAVIND, MD.,
Reg. No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE - IV

# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

## CERTIFICATE OF MERIT

This is to certify that AISWARYA.S.NAIR has actively participated in the Value Added Course on 'Diabetes and Dietary Practices' conducted between July 2019- November 2019, organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Venkatasamy
**RESOURCE PERSON**

Dr. C. Aravind
**COORDINATOR**

Dr. C. ARAVIND, MD.,
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

ANNEXURE - V

## Student Feedback Form

Course Name: **DIABETIES AND DIETARY PRACTICES**

Subject Code: **IM11**

Name of Student: Abhilash. J Roll No.: U17MB255

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

| Sl. NO | Particulars | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Objective of the course is clear | | | | | ✓ |
| 2 | Course contents met with your expectations | | | | | ✓ |
| 3 | Lecturer sequence was well planned | | | | ✓ | |
| 4 | Lectures were clear and easy to understand | | | | | ✓ |
| 5 | Teaching aids were effective | | | | ✓ | |
| 6 | Instructors encourage interaction and were helpful | | | | ✓ | |
| 7 | The level of the course | | | | | ✓ |
| 8 | Overall rating of the course | 1 | 2 | 3 | 4 | 5 |

**** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory***

Suggestions if any:

Signature

Date: 08/11/19

ANNEXURE V

**Student Feedback Form**

Course Name: **DIABETIES AND DIETARY PRACTICES**

Subject Code: **IM11**

Name of Student: Afzan.M Roll No.: U1FMB259

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

| Sl. NO | Particulars | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Objective of the course is clear | | | | | ✓ |
| 2 | Course contents met with your expectations | | | | ✓ | |
| 3 | Lecturer sequence was well planned | | | | | ✓ |
| 4 | Lectures were clear and easy to understand | | | | | ✓ |
| 5 | Teaching aids were effective | | | | ✓ | |
| 6 | Instructors encourage interaction and were helpful | | | | | ✓ |
| 7 | The level of the course | | | | ✓ | |
| 8 | Overall rating of the course | 1 | 2 | 3 | 4 | 5 |

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 08/11/2019

Date: 11/11/2019

From
Dr. Aravind. C
Professor and Head
Department of Internal Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research
Chennai

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

**Sub: Completion of value-added course: DIABETES AND DIETARY PRACTICES**

Respected Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **"Diabetes and dietary practices"** on 08/11/2019. We solicit your kind action to send certificates for the participants. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. Aravind. C

DR. C. ARAVIND, MD.,
Reg.No:68432
Professor & HOD, General Medicine
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

**Encl: Photographs**