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Journal of Diabetes Education

To Dispel Darkness Of Diabetes

DIET MANAGEMENT

EXERCISE

MEDICATION

An Official Publication of
Association of Diabetes Educators
(India)

Invokana®
canagliflozin 100mg tablets

- Control diabetes with confidence[1]
- Significant **HbA1C** reduction[1]
- **KgA1C** resolution[1]

MOTIVYST®
Canagliflozin 300mg

DOES MORE... MUCH MORE

More to Deliver

- Only **dual SGLT1 & SGLT2** inhibitor in India[2,3]
- **2.56%** HbA1C and **5.2%** weight reduction[4,5]
- **35%** Increase in **GLP1 and PYY** levels[6,7]

With CV and Renal Protection

HbA1C: Glycated Hemoglobin; CV: Cardiovascular; SGLT1: Sodium Glucose Linked Transporter 1; SGLT2: Sodium Glucose Linked Transporter 2; GLP1: Glucagon like peptide 1; PYY: Peptide YY

References: 1. Jakher M *et al.* Diabetes, metabolic syndrome and obesity:targets and therapy; **2.** Sokolov V *et al.* Dierentiating the SodiumGlucose Cotransporter 1 Inhibition Capacity of Canagliflozin vs. Dapagliflozin and Empagliflozin Using Quantitative Systems Pharmacology Modeling. CPT: pharmacometrics & systems pharmacology. 2020 Apr;9(4):222-9; **3.** Mohan V *et al.* Remogliflozin Etabonate in the Treatment of Type 2 Diabetes: Design, Development, and Place in Therapy. *Drug Design, Development and Therapy*. 2020;14:2487; **4.** Stenlöf K, *et al. Diabetes Obes Metab.* 2013;15(4):372–82; **5.** Lawrence A. Leiter *et al. Diabetes Care.* 2015;38:355–364; **6.** P. Song et al, *Expert Opinion On Therapeutic Targets*, Apr 2016; **7.** Polidori *et al. Diabetes Care.* Vol 36, Aug 2013.

Abridged Prescribing Information
For the use of a Registered Medical Practitioner or a Hospital or Laboratory
Canagliflozin tablets 100 mg / 300mg
INVOKANA®

Composition and Strength: Canagliflozin 100 mg / 300mg. Each 100 mg tablet contains 102 mg Canagliflozin hemihydrate, equivalent to 100 mg Canagliflozin. Each 300 mg tablet contains 306 mg Canagliflozin hemihydrate, equivalent to 300 mg of Canagliflozin. **Pharmaceutical form:** 100 mg - The tablet is yellow, capsule-shaped, immediate-release and film-coated, with "CFZ" on one side and "100" on the other side. 300 mg - The tablet is white, capsule-shaped, immediate-release and film- coated, with "CFZ" on one side and "300" on the other side. **Therapeutic Indications:** INVOKANA® is indicated as an adjunct to diet and exercise to improve glycemic control in adults with Type-2 Diabetic Mellitus. INVOKANA® is indicated to reduce the risk of major adverse cardiovascular events (cardiovascular death, nonfatal myocardial infarction and nonfatal stroke) in adults with type 2 diabetes mellitus and established cardiovascular disease. INVOKANA® is indicated to reduce the risk of end-stage kidney disease (ESKD), doubling of serum creatinine, cardiovascular (CV) death, and hospitalization for heart failure in adults with type2diabetes mellitus and diabetic nephropathy with albuminuria > 300 mg/day#. **Dosage and Administration:** The recommended starting dose for adult > 18 years is 100 mg or 300 mg once daily orally preferably before the first meal of the day. A starting dose of 100 mg once daily should be used in patients on loop diuretics and patients ≥ *75 years of age. (A) Dosage Recommendation for Glycemic Control and/or Reduction of a Major Adverse Cardiovascular Event (MACE) in Patients with CVD:* In patients with an eGFR 45 mL/min/1.73 m² to < 60 mL/min/1.73 m², the dose of INVOKANA® is limited to 100 mg once daily. The 300 mg dose may be considered for patients with an eGFR > 60 mL/min/1.73 m², who need tighter glycemic control and who have a low risk of adverse reactions associated with reduced intravascular volume with INVOKANA® treatment. *(B) Dosage Recommendation for Chronic Kidney Disease and Albuminuria (> 300 to ≤ 5000 mg/g):* In patients with an eGFR 30 mL/min/1.73 m² to < 90 mL/min/ 1.73 m², the dose of INVOKANA® is limited to 100 mg once daily. **Contraindications:** Hypersensitivity to the active substance or to any of the excipients. **Warnings and Precautions:** INVOKANA® has not been studied in pediatric patients (< 18 years), patients with type 1 diabetes and is therefore not recommended for use. INVOKANA® should not be used for the treatment of diabetic ketoacidosis or in patients with an eGFR< 45 mL/min/1.73 m² [CrCl < 45mL/min] for the purpose of glycemic lowering and/or Reduction of a Major Adverse Cardiovascular Event (MACE) in Patients with CVD. 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This serious rare infection, called necrotizing fasciitis of the perineum, is also referred to as Fournier's gangrene. **Drug Interactions:** The metabolism of INVOKANA® is primarily via glucuronide conjugation mediated by UDP glucuronosyl transferase 1A9 (UGT1A9) and 2B4. INVOKANA® neither inhibits cytochrome P450 CYP1A2, CYP2A6, CYP2C19, CYP2D6, or CYP2E1, CYP2B6, CYP2C8, CYP2C9, nor induces CYP1A2, CYP2C19, CYP2B6, CYP3A4 at higher than therapeutic concentrations. INVOKANA® is a P-glycoprotein (P-gp) substrate and inhibits P-glycoprotein mediated transport of digoxin with low potency. Please refer to full prescribing information for further details. **Pregnancy, Breast-feeding and Fertility:** There are no adequate and well controlled studies in pregnant women. INVOKANA® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. It is not known if INVOKANA® is excreted in human milk. A risk to the breast-fed child cannot be excluded. The effect of INVOKANA® on fertility in humans has not been studied. **Cardiovascular and renal outcomes:** INVOKANA® significantly reduced the risk of first occurrence of the primary composite endpoint of cardiovascular death, nonfatal myocardial infarction, or nonfatal stroke (HR: 0.86; 95% CI 0.75,0.97). Each MACE component contributed to the overall composite. Subjects treated with INVOKANA® had a lower risk of hospitalization for heart failure compared to those treated with placebo. In the CANVAS Program, for time to first adjudicated nephropathy event (doubling of serum creatinine, need for renal replacement therapy, and renal death), the HR was 0.53 (95% CI:0.33, 0.84) for canagliflozin (0.15 events per 100 patient-years) versus placebo (0.28 events per 100 patient-years). **Adverse reactions:** In clinical studies of INVOKANA® the most commonly reported adverse reactions during treatment (≥ 5%) were vulvovaginal candidiasis, urinary tract infection, and polyuria or pollakiuria. Other adverse reactions in clinical studies of INVOKANA® that occurred at a rate < 2% in placebo-controlled studies were adverse reactions related to reduced intravascular volume (postural dizziness, orthostatic hypotension, hypotension, dehydration, and syncope), skin rash, and urticaria. In the clinical development program, events of DKA were reported in 0.2% of patients treated with INVOKANA®. In long-term clinical studies of INVOKANA® in type 2 diabetes patients with established cardiovascular disease (CVD) or at least two risk factors for CVD, an approximately 2-fold increased risk of lower limb amputation (primarily of the toe and midfoot) has been observed in patients treated with INVOKANA®. **Overdose:** In the event of an overdose, it is reasonable to employ the usual supportive measures, e.g., remove unabsorbed material from the gastrointestinal tract, employ clinical monitoring, and institute supportive treatment as dictated by the patient's clinical status. Canagliflozin was negligibly removed during a 4-hour hemodialysis session. Canagliflozin is not expected to be dialyzable by peritoneal dialysis. **Storage:** Do not store above 30OC. Keep out of sight and reach of children.
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MOTIVYST® 100 mg significantly reduced the risk of the primary composite endpoint based on a time-to-event analysis [HR: 0.70; 95% CI: 0.59, 0.82; p<0.0001] MOTIVYST® 100 mg also significantly reduced the risk of hospitalization for heart failure [HR: 0.61; 95% CI: 0.47 to 0.80; p<0.001] **Adverse reactions:** In clinical studies of MOTIVYST® the most commonly reported adverse reactions during treatment (≥ 5%) were vulvovaginal candidiasis, urinary tract infection, and polyuria or polakiuria. Other adverse reactions in clinical studies of MOTIVYST® that occurred at a rate < 2% in placebo-controlled studies were adverse reactions related to reduced intravascular volume (postural dizziness, orthostatic hypotension, hypotension, dehydration, and syncope), skin rash, and urticaria. In the clinical development program, events of DKA, were reported in 0.2% of patients treated with MOTIVYST®. 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PHARMACEUTICAL COMPANIES OF Johnson & Johnson

JOURNAL OF DIABETES EDUCATION

To Dispel Darkness of Diabetes

Vol. 10 **Number 2** **April-June, 2022**

CONTENTS

WHY DO YOU NEED TO CHOOSE FOOTWEAR FOR A PERSON WITH DIABETES?

Debasis Basu*, Kiran Bahrus**

Introduction

"I cried because I had no shoes until I met a man who had no feet" – Persian Proverb

But was the man with no feet too, without shoes and it was likely a person with diabetes (PWD) is the biggest unsolved question.

Historical Story

Tracking the footsteps of the first anatomically modern human backwards, I reached Africa only to be intrigued more about how all of us who are anywhere on this living planet today, evolved from the members of that same family as they moved outside Africa about 70,000-100,000 years ago. The most important observation was bipedalism, (or two-legged locomotion), the first major evolutionary change in them. History began at the ground level with small steps and there was this natural lust of wandering in the feet of our ancestral humans minds that burned to set out to the ends of the earth. Since then, many paths were made by walking, as our ancestors were able to achieve this feat making the decision to leave their homes.

Looking at the footprints of how they travelled to various parts of the world, let us shift our focus from paleoanthropology to paleocalceology. We see today that the modern day Sketchers, Adidases, Nikes, Reeboks and Batas may be direct descendants of the first supportive footwear, as evidenced to be worn approximately 40,000 years ago!

The Science of the Foot behind Footwear

As humans mastered bipedal locomotion, their foot had evolved to be the basis for such a specialised gait. The human foot alone comprises 26 bones, 33 joints and 19 muscles with a complex array of muscles, both internal and external of the foot, which combine with the somesthetic system to control balance and movement along with 104 cutaneous mechanoreceptors located in the sole of the foot. Collectively, these factors play an important role in balance and movement control of the foot. But whether the impact of wearing shoes may influence movement control and associated variables during walking gait is not yet clear. Across the passage of centuries, as the design of the footwear had evolved from simple open-toe sandals to more complex items of fashion, with focus of design being increasingly shifted towards aesthetics, the potential impact on foot function increasingly was overlooked. Today, modern footwear is designed to fulfil a range of purposes, the accomplishment of which is judged by three criteria:

(a) Form - aesthetic appeal of footwear

(b) Function - ability of footwear to accomplish its intended purpose, that is, to protect the feet of individuals who undertake activities that may present a risk of injury

(c) Fit - how footwear can accommodate the morphology of the foot. Footwear fitting is acknowledged as being vitally important as in most cases fit governs function and hence footwear cannot fulfil its intended purpose if it does not fit the foot correctly.

What is the Rationale of Choosing the Right Footwear?

An incorrectly fitted footwear is a major contributor to the development of structural

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foot disorders, such as hallux valgus and lesser toe deformity, as well as skin lesions, such as corns and calluses. Correct footwear fitting is an inherently detailed undertaking for two main reasons. Firstly, the footwear industry is currently unable to design and manufacture footwear that can conform to the three-dimensional morphology of all feet in the population. This is because foot morphology is highly variable between individuals, and there is limited variety in the shapes used to construct footwear. Secondly, footwear selection is not purely based on quantitative measurements of footwear shape and size, but may be influenced by qualitative factors. It is therefore probable that a substantial proportion of the population are wearing incorrectly fitted footwear.

Pointed-toe and closed-toe shoes have become increasingly prominent in Western societies and are slowly making an entry into the Asian subcontinent due to rapid globalization. Restriction of the area within the toe box potentially contributes to common toe deformities such as hallux valgus, a valgus deformity on the first metatarso-phalangeal joint. This is particularly a problem at advanced age with approximately two-thirds of the older population's feet being considerably wider than the footwear. Additionally, research has reported that wearing high-heels of 5 cm or higher over a minimum of a two-year period has significant effects to the muscle-tendon unit at the ankle with a significant reduction in the gastrocnemius medialis fascicle lengths and significantly greater Achilles' tendon stiffness in the high-heels group. This may result in a more plantar flexed ankle position at rest and a reduced active range of motion. It demonstrates the modifiable nature of the foot-ankle complex and the importance of wearing appropriate footwear to maintain good foot health and function. Research has also shown how certain footwear can directly influence function. A common feature of modern athletic footwear is that of increased sole thickness which is marketed as providing cushioning against harmful impacts. It is seen that wearing this type of footwear evokes significantly increased activation in the *Peroneus Longus* suggesting greater interference to ankle stability. Moreover, footwear has been shown to hinder kinesthesia observed in volunteers standing barefoot compared with wearing athletic footwear.

Diabetes foot care is an evidence-based means of preventing diabetes foot ulcer. The components of diabetic foot care include yearly comprehensive foot examination, prompt identification of risk factors to diabetic foot ulcer, diabetic foot education and standard footwear practices. The association between ill-fitting shoes and the development of foot ulceration in people with diabetes is well documented. Prospective studies have found that either ill-fitting footwear alone or minor trauma caused by footwear is the most common precipitating factor in the development of diabetic foot ulcers. Five studies from Harrison et al, 2007 to McInnes et al, 2012 have investigated shoe fitting among participants diagnosed with diabetes, with all using a similar approach to fitting analysis based on footwear sizing. Two studies considered footwear fitting to be incorrect if there was half a size difference between the foot and footwear while another study applied a full size benchmark. Many studies deemed footwear size inappropriate if the difference between foot and footwear length was outside a range of 10–15 mm or greater than 2 mm. Among these studies, between 33% and 82% of PWD were wearing shoes of incorrect length. Of these, between 10% and 43% were wearing footwear that was too short, while between 23% and 81% (diabetic men only) wore footwear that was too long.

In terms of shoe width, there was evidence among a sample of 568 diabetic individuals with peripheral neuropathy that the forefoot of most PWD is broader than the most common industrial shoe width references used by shoe manufacturers. In a sample of 100 individuals (mean age 62.0 ±SD 14.9, range 24–89 years), 46% of individuals wore footwear that was too narrow in width. One-third of PWD wore correct shoes on either foot whilst seated or whilst standing. However, only 24% of PWD were

wearing shoes that were of the correct length and width for both feet whilst seated, 20% upon standing and only 17% of in both groups.

However, of these participants, 67% wore the correct length footwear, which may indicate that a large proportion of PWD may be selecting footwear that is correctly fitted for length, but are not considering, or are not able to acquire, footwear of sufficient width. There was no evidence that a greater proportion of participants with diabetes wore incorrectly fitted footwear (according to length) compared to matched controls without diabetes. However, there was evidence of an association between incorrectly fitted shoes and the presence of diabetes-related foot lesions in a cohort of 440 male veterans with diabetes, it was found that those with current foot ulceration were five times more likely to be wearing incorrectly fitted shoes (at least one full shoe size difference). The overall findings suggest that, even though a similar proportion of individuals with and without diabetes wear incorrectly fitting footwear, the consequences of doing so for an individual with diabetes may be greater due to potential development of diabetic foot ulceration. Therefore prescribed footwear can be used to prevent and treat such lesions. Yet, footwear is only effective if worn and the shoes supplied are acceptable to the person. A study of people with diabetes who were supplied with footwear at a diabetic foot clinic was conducted using face-to-face interviews and a structured questionnaire, to assess footwear usage and their individual preference. Of the 50 subjects who participated, only 11 (22%) regularly wore their prescribed footwear and 19 subjects wore slippers indoors. Only 12 subjects (24%) were aware of the cost of shoes. Most subjects were happy with their footwear and the service which was provided, whereas 9 (18%) disliked the style of shoes and stated that they were not aesthetic. Thus, although expensive footwear is supplied to patients to prevent and treat foot ulcers, it may not be used regularly. Hence a wider choice of footwear should be available in the market to meet the needs.

The Wrong-Foot Trend continues all across the Globe

In India, PWD with age and sex-matched controls were assessed for correlating footwear practices and footcare knowledge and the presence of foot complications, where 44.7% patients had not received previous foot care education. Unsafe outdoor footwear practices were prevalent in 46.9% of PWD. Around the same time, in Nigeria, Africa, a study conducted evaluated participants' shoes to find that 68% of the footwears was inappropriate. Among the shoe styles that didn't pass were shoes with pointed tips or toes, high-heels & thong-style sandals or flip-flops. Some wore shoes that were the wrong size. But despite these flaws in shoe wear, 73% of the people thought their inappropriate footwear was acceptable.

This mindset is very common in our country and prevails. Between 63 and 72% of participants wore shoes that did not accommodate either the width or length dimensions of the feet. There was also evidence that incorrect footwear fitting was associated with foot pain and foot disorders such as lesser toe deformity, corns and calluses also, 46% to 81% of PWD were more likely to wear shoes that were too narrow.

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HOW DOES ONE CHOOSE FOOTWEAR FOR A PERSON WITH DIABETES?

Kiran Bahrus *, Debasis Basu**

Introduction

Footwear Tips for Persons with Diabetes (PWD):

Similar to diet planning, there is no such thing as perfect footwear for PWD; but there can be these shoes which can help delay or prevent the onset of foot ulceration in diabetes and not cause or accelerate its development.

Sharing Preliminary Education: To start with, the role of a Diabetes Educator (DE) is to let all PWD know that as high as one-third of them run the serious risk of foot ulcers. Often the most common precipitant of ulceration is constant rubbing from footwear. The problem that needs to be addressed in this regard is that PWD are often asked to put back the same shoes that caused the feet to ulcerate further. This approach doubles number of recurrent ulcerations and a more than five-fold increase in ulceration at 12 months has been reported when compared versus a group in therapeutic shoes.

Vast majority of diabetic foot complications resulting in amputation usually begin with the formation of skin ulcers. The risk of lower extremity amputation is 15 to 46 times higher in PWD than in persons who do not have diabetes mellitus. Furthermore, foot complications are the most frequent reason for hospitalization in patients with diabetes, accounting for up to 25% of all diabetic admissions even in most developed countries. Interestingly, early detection and appropriate treatment of these ulcers may prevent up to 85% of amputations. Also noteworthy, the risk of ulcer recurrence after healing is high: 40% in the first year and 60% after three years.

Elevated plantar pressure during walking, plays a pivotal role in the development of foot ulcers and their recurrence. Therefore, to prevent ulcer recurrence, the International Working Group on the Diabetic Foot 2015 Guidelines and the more recent Dutch and Australian 2017 Guidelines recommend the use of custom-made footwear with a demonstrated peak plantar pressure relieving effect of at least 30% compared to usual care or recently worn therapeutic (custom-made) footwear.

Along with economic, cultural and functional factors which influence the selection of footwear, comfort should be considered as the most important requirement. Beyond just the state of being physically relaxed and free from pain, comfort broadly incorporates the absence of other unpleasant physiological sensations (such as rough textures, extremes in temperature or excessive moisture) and the presence of highly subjective feelings (such as ease, support and contentment). In addition to facilitating a general sense of wellbeing, the use of comfortable footwear also has a range of practical advantages, as it may facilitate physical activity, enhance athletic skills and sporting performance, and reduce the incidence of injury.

Wearing properly fitted shoes can help reduce that risk because as the PWD should always remember that the biggest issue with neuropathy is, it is often silent. Therefore yearly evaluation by a doctor or diabetes educator or podiatrist should be made mandatory. Seeing these professionals can reduce risk of getting a wound leading to amputation by almost 20% to 70%. Experts urge all PWD to check their feet carefully each day for blisters, sores, cuts,

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redness, warm areas, swelling, ingrown toenails and other abnormalities and report such changes to their doctor, if any. They should wash and dry their feet as a daily recommended practice. All PWD should have been given minimum education about footwear. When providing footwear to a PWD, ensure they know their foot risk status and confirm this through evidence-based screening by trained healthcare professionals. In addition to the foot screening, other factors that should be considered includes the person's gait pattern, activity levels, occupation, level of mobility, living situation, cultural beliefs, personal goals and preferences. These factors may influence the possible options for appropriate footwear.

In accordance with the Australian National Health and Medical Research Council (NHMRC) Diabetic Foot Guideline and the International Working Group on the Diabetic Foot (IWGDF) guidance documents, stratification of foot ulceration and amputation in PWD is performed after screening for:

i. peripheral neuropathy (10gm monofilament sensitivity; vibration perception; neuropathy disability score)

ii. peripheral artery disease (palpation of peripheral pulses; ankle-brachial pressure index; toe-brachial pressure index)

iii. foot deformity (six point scale scoring small muscle wasting, Charcot foot deformity, bony prominence, prominent metatarsal head, hammer or claw toes and limited joint mobility), and assessment of a history of foot ulcer(s) or lower-extremity amputation

Table 1:

Guidance on Risk Categorisation for Complications and Elements to consider during Foot Assessment

Stratification of foot ulceration and amputation risk In diabetes		NHMRC grade*	Foot care and education tailored to foot risk status
Low risk	No risk factors for foot ulceration or ulceration/amputation	C	Offer basic foot care information and annual foot assessment
Intermediate risk	One risk factor only Qe neuropathy,PAD) and no previous history of foot ulceration or amputation	C	Offer program that includes foot care education, podiatry review every six months and footwear assessment
High risk	Two or more risk factors [le neuropathy, PAD or foot deformity) and/or previous foot ulceration or amputation	C	Offer program that includes foot care education, podiatry review and footwear assessment (eg a high-risk foot service)
High risk	Aboriginal or Torres Strait Islander people with diabetes	Practice Point	Offer program that includes foot care education, podiatry review and footwear assessment (eg a high-risk foot service)

Source: *NHMRSC Guidelines, 2011*

When providing footwear, measure the length, width, depth and girth of the foot. The footwear needs to accommodate and ensure that the footwear follows the criteria given in Table 2 and Table 3:

Table 2:

Recommendations on Footwear for PWD

For all people at-risk of foot ulceration:

- Advise PWD to wear footwear that fits, protects and accommodates the shape of the feet.
- Advise PWD to always wear socks within their footwear, in order to reduce shear and friction.
- Educate PWD, their relatives and caregivers on the importance of wearing appropriate footwear to prevent foot ulceration.

For people at intermediate- or high-risk of foot ulceration: • Instruct PWD at intermediate-or high-risk of foot ulceration to obtain footwear from an appropriately trained professional to ensure it fits, protects and accommodates the shape of the feet. • Motivate PWD at intermediate- or high-risk of foot ulceration to wear footwear at all times, both indoors and outdoors. • Motivate PWD at intermediate- or high-risk of foot ulceration (or their relatives and caregivers) to check their footwear, each time before wearing, to ensure that there are no foreign objects in the footwear, or penetrating, the soles. Check feet, each time their footwear is removed, to ensure that there are no signs of abnormal pressure, trauma or ulceration. • For people with a foot deformity or pre-ulcerative lesion, consider prescribing medical-grade footwear, which may include custom-made in-shoe orthoses or insoles. • For people with a healed plantar foot ulcer, prescribe medical-grade footwear with custom-made in-shoe orthoses or insoles with a demonstrated plantar pressure reducing effect at the high-risk areas. • Review prescribed footwear every three months to ensure it still fits, protects and supports the foot.
For people with diabetic foot ulceration: • People with a plantar diabetic foot ulcer, the footwear is not specifically recommended for treatment; prescribe appropriate offloading devices to heal ulcers.

Source: *Van Netten et al, 2018*

Table 3:

Requirements for Footwear for PWD

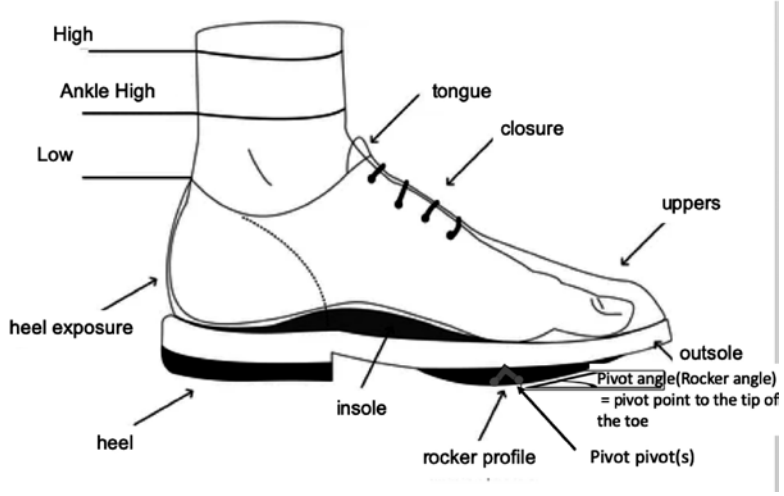
Feature	Requirements
Length	Inner length of the footwear should be 1–2 cm longer than the foot length as measured from heel to the longest toe when a person is standing. Adequate length needs to be confirmed when people are weight-bearing while wearing the footwear.
Depth	Depth should accommodate the toes to move freely without causing pressure at the medial, lateral or the dorsal side.
Width	Width should equal the width of all parts of the foot. Width is good when the upper can be slightly bunched. The relation between forefoot and hindfoot is important, as accommodating a wide forefoot may result in the heel being too wide.
Height	Footwear height can be low, ankle-high, or high. High footwear provides more firmness, stability and reduces joint motion. The shaft of high footwear also contributes to forefoot pressure reduction.
Insole	The removable moulded insole can be pre-fabricated, adjusted or custom-made. The primary function of the insole is pressure redistribution. This is achieved via the principle of increasing the contact area between the foot and the insole and the addition of corrective elements in the insole. Shock-absorbing, soft but sufficiently resilient and non-slippery materials should be used.
Outsole	Rubber, plastic, and leather can all be used in construction of footwear outsoles, but rubber outsoles are thought to be superior. Outsoles can be supple, toughened or stiff. The shoe should not be more supple than the foot, or friction between the foot and shoe will develop during push-off.

Feature	Requirements
Rocker Profile	Rocker profiles have proven effectiveness in reducing plantar pressures, especially the forefoot. The rocker profile chosen depends on the affected joints and is determined by the apex position (pivot point) and the angle from the pivot point to the tip of the toe. For plantar pressure reduction of the metatarsophalangeal joints, the pivot point needs to be proximal to these joints. The rocker profile also impacts balance; the more proximally placed, the greater the balance disturbance. A person's balance should therefore always be taken into account when deciding on the rocker profile. (See Figure 2)
Heel enclosure	An adequately fitting and enclosed heel is recommended, as open backed footwear or a heel enclosure that is too wide can result in injury and usually makes one claw their toes in order to keep them on. The heel counter needs to be free of edges protruding into the footwear.
Heel lift	The heel lift (or heel forefoot difference or pitch) should be generally 1.5–2 cm, and should not exceed 3 cm.
Closure	Adequate closure (or fixation) is needed to keep the foot from sliding forward. Closure should allow secure longer-term fastening and individual adjustment. Laces have long been considered the optimal choice; however, alternatives that are easier to use while still meeting these criteria are available as well and innovative closures continue to be developed.
Uppers	The uppers consist of the 'quarter'(hind and midfoot) and 'vamp' (forefoot and toes). Uppers should be made from leather or a combination of materials (similar to sports shoes) with smooth inner lining made from a material that does not harden over time, with limited seams and preferably no seams in the vamp area as they reduce the ability of the leather to give. Uppers should be breathable and durable and have the ability to mould to deformities of the foot without resulting in pressure areas. Uppers can be supple, toughened or stiff. The vamp area should generally remain supple to accommodate the toes.
Toe box	The part of the shoe that covers and protects the toes. This should be supple and should accommodate the shape of the toes, to avoid any rubbing on the toes.

Source: *Van Netten et al, 2018*

Figure 1:

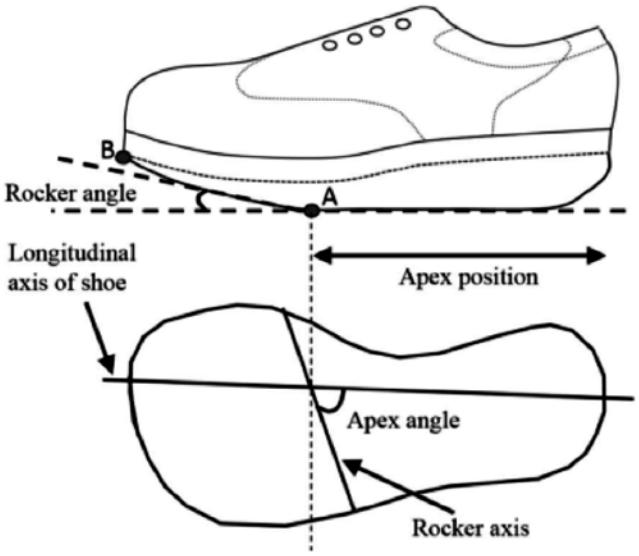
Footwear Features depicted to understand the requirement of Footwear in Table 3



Source: *Van Netten et al, 2018*

Figure 2:

Rocker Profile – Ideal Measurement



Schematic to illustrate rocker angle (RA), apex position and apex angle. Apex position was varied by moving point A proximally or distally and a corresponding adjustment made to the position of point B to ensure a consistent rocker angle

Source: *Van Netten et al, 2018*

The Basics of Footwear for a PWD:

- The PWD need shoes that support the arch, ankle and the heel.
- Shoes for PWD should have a higher, wider toe box, giving the toes extra wiggle room - the extra room in diabetes shoes protects your toes while you stand and walk.
- Some PWD may overpronate (roll the feet too far inward) or underpronate (not roll the feet inward enough) when walking, which can also cause hot spots that may develop into blisters and sores. So the soles of shoes for PWD have special stabilizers like rocker profile or pivot points to keep feet level.
- Thicker soles will cushion the feet from wear and tear and that little bit of extra width will help to avoid those hot spots

What should the PWD carefully watch for before buying Footwear?

A general overview that is mandatory while choosing any footwear for a PWD:

- Shoes made of soft, stretchable leather with a deep rounder and wider toe box – avoid loafers.
- For better shock absorption, a cushioned sole is always preferred instead of a thin leather sole.
- The distance between the longest toe and the shoe tip should be half of the thumb's width of the PWD.
- To allow an extra $^{3}/_{8}$ to ½ inch of room between the toes and the top of the shoe.
- To ensure proper fit, it is best to try on shoes while wearing the socks that the PWD generally would be using.
- While purchasing, PWD should consider having no inner seams in the shoes that could rub and cause a blister or hot spot – it is always wise to run the fingers around inside to make sure the inner lining is smooth.
- Slip-on shoes are not a good idea because they cannot be adjusted. Feet tend to swell as the day proceeds, meaning that slip-on shoes that fit well in the morning may chafe or cut-off circulation in the afternoon. It is advisable to steer clear of sandals, flip-flops or other open-toe shoes. Straps can put pressure on those vulnerable parts of foot, leading to sores and blisters. Open-toe shoes can make one prone

to injuries like cuts. It's also easier for gravel and small stones to get inside them. These can rub against the feet, causing sores and blisters. Velcro fasteners or lace-ups make a better choice.

- Ideally, shoes also should have an insole that can be removed. Once the shoe's insole is removed, the PWD should step on it to see whether the foot fits comfortably on top of it with no overlap. If the foot is bigger than the insole then, naturally it will get be crammed inside the shoe when worn. Therefore a different shoe should be chosen. Removable insoles are also important because one may need to replace it with an orthotic, especially made to order. Footwear should be tried before buying preferably shop for shoes in the late afternoon when the feet have swollen adequately.
- The internet-based marketing age makes one buy shoes cheaper online, but there is no substitute to footwear trial. Once, one is confident from previous experience of finding a suitable brand and size, it can be considered to buy online.

Most recent shoemakers can provide products aimed at customers with special needs fulfilling these parameters as shown in Table 4.

Table 4:

Specific Footwear requirements for PWD and Special Needs with a Foot deformity

Medical features	Insole	Shoe height	Pivot point	Outsole [b]	Leg	Tongue	Heel
Sensory loss	no	low [a]	NA	supple	supple	supple	normal
Sensory and autonomic dysfunction	yes	low	NA	supple	supple	supple	resilient material
Limited joint mobility	yes	low	normal	toughened	supple	supple	resilient material
Hollow-foot with claw toes	yes	bottine	early	toughened	toughened	toughened [c]	resilient material
Flexible flatfoot with hallux valgus	yes	high	normal	toughened	toughened	toughened [c]	resilient material
Rigid flatfoot with hallux valgus	yes	bottine	early	toughened	strong medial support	toughened [c]	resilient material
Charcot foot	yes	high	early	stiff	stiff	toughened [c]	resilient material
Hallux amputation	yes	high	early	stiff	toughened	toughened [c]	resilient material
Forefoot amputated	yes	high	early	stiff	stiff	stiff	resilient material
Ulceration	yes	high	early	stiff	stiff	toughened/ stiff	resilient material

Source: *Van Netten et al, 2018*

[a] Unless a person has limited joint mobility in the ankle joint, then use ankle-high or high footwear

[b] The uppers consist of quarter and vamp, the requirements here is the quarters, as the vamp typically needs to remain supple to accommodate the toes.

[c] When a tongue is toughened, it should be padded as well

Because there are so many PWD, one may find good shoes everywhere in a wide range of prices and styles if one does a carefully selection.

Nowadays, heel spurs and plantar fasciitis is very common in people with obesity and diabetes. Therefore, well-fitting and comfortable shoes do not only overcome these painful complaints but also help keep small foot problems, like a corn, a blister, a callus from turning into severe ones.

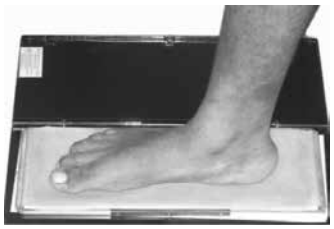
To Find the Right Size

To obtain the foot anthropometric measurements, a foot measurement platform is commonly utilized; the Foot Imprinter Harris Mat (FM1111,™) shown in Figure 4 is a simple, inexpensive and practical foot pressure measurement device routinely used for clinical use as a semiquantitative mat calculating the impact of plantar pressure by visual comparison of the greyness of the footprint. Beyond the measurement of dynamic loading of the foot as an important metric for understanding the biomechanics of the foot, the outline of each foot can be obtained by direct tracing. McPoil et al, then created a mask of the five regions of weight bearing (hallux, lesser toes, metatarsal heads, midfoot, and heel regions).

Figure 4:

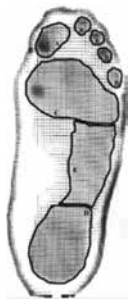
(a) Harris Mat with the Ink Pad and the Paper for the Imprint

(b) Foot placed on the Mat



(c) The Imprint

(d) The outline of the foot



Source: *McPoil et al, 2009*

In addition to the foot measurement platform, digital calipers as shown in Figure 5 are used as instruments to permit measurement of both arch height and the various foot width.

Figure 5:

(a) Digital Caliper for Measuring Foot Widths being used to Measure Forefoot Width

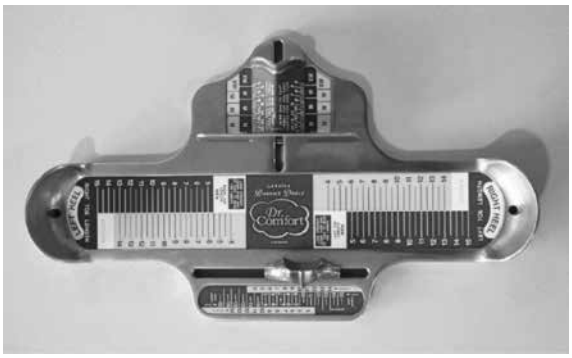
(b) To Measure Midfoot Width

(c) To Weasure Heel Widths

Source: *McPoil et al, 2009*

The other tool used for determining shoe size is called the Brannock Device shown in Figure 6. It measures the width, taken across the ball of the foot; the arch length, measured from the heel to the ball of the foot; and the overall length from heel to toe. To get an accurate measurement, one should stand naturally with one's weight divided evenly between both feet.

Figure 6:
Brannock Device



Source: *Menz et al, 2014*

Quick Tips for Buying Footwear:

Once the correct size is determined, one should keep these following points in mind:

1. Better to avoid high-heeled shoes, because it put pressures on the ball of the foot. In PWD with varying grades of neuropathy, there may be probability of getting calluses or having sores which go unnoticed. High heels can also cause body-balance issues in these PWD.
2. It is not prudent to buy shoes which are uncomfortable. Planning to break into by wearing new shoes for 1-2 hours for the first time, then check feet for cuts or blisters. The next day, wearing them 3-4 hours and gradually building up time to make sure they are not injuring the feet. Shoes should feel good, when tried for the first time. If one takes off new shoes after wearing them only for a couple of hours and finds red, tender spots, it is not advisable to wear them again.
3. It is ideal to buy at least two pairs with good support. Each pair may have different pressure points on the feet, so that changing shoes daily will not be hard on the feet and they will get aired out.
4. In some countries, insurance covers the cost of special "therapeutic" shoes for PWD which must meet certain criteria; such as having changes in the foot shape, past foot ulcers, or calluses and evidence of nerve damage. As a doctor needs to prescribe such footwear, talking to the doctor would be a prerequisite.

Keep Your Shoes On

Once you find shoes that fit well, best is to wear those all the time, especially when outdoors. Never go barefoot, even around the house or outdoor even a few steps to go to the bathroom at night. In such a situation do the footwear trial on a carpeted surface to avoid damage to them and dialogue for return policy with vendor.

Enjoy Occasional Fancy Feet

As PWD is advised to always wear sensible shoes every day for the rest of your life, yet the need for being extra careful may depend on how advanced the neuropathy is how numb or poor the circulation is.

If feet feel normal and blood flow is adequate, it might give the PWD a rare chance to wear dressy shoes like high heels or pointy wing-tips for very short periods of time. Usually best when it is for an hour and when not going for long walks.

Quick facts to help the PWD for maintaining Happy Feet

- Checking feet every day to make sure there are no developing sores, ulcers, or calluses.
- Trimming toenails regularly, making sure to cut straight across to prevent ingrown toenails.
- Smoothening the corns and calluses gently with a pumice stone or an exfoliating foot scrub.
- Avoid using razors or other sharp tools on the feet.
- Wash the feet daily with mild soap(shampoo) and warm water to promote circulation. Make sure never to use hot water to avoid scalds, heating pad or an electronic massager which might heat up.
- Dry feet completely to avoid fungal infections. Use emollient lotion like aloe vera on the soles of the feet helps to prevent cracking(never put the lotion between your toes in the webs).
- Make sure to make appointments as necessary with the podiatrist or diabetes educator at regular intervals.

- No smoking or inhale second hand smoke consciously and keep blood glucose, blood pressure and cholesterol under control.
- Shoes worn by PWD daily will generally need replacing by about two years. Most professional shoe repair shops may repair and refresh the ones that PWD had bought once upon a time, to make them last longer. But, ideally replacing these items with newer ones are certainly desired if:
  - The heel begins to collapse to one side
  - The bottom of the heel is worn down
  - The inner lining of the shoe is torn

"How many roads must a man walk down, Before you call him a man? "— Bob Dylan.

So let us all take care of the feet to walk those extra miles to become that really healthy person with happy feet to conquer the world

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EXAMINATION OF THE FOOT IN ROUTINE PRACTICE

Rajiv Kovil *

Type 2 diabetes summons a host of complications which are associated with increased morbidity and mortality. Patients often fail to identify the surging risk that go hand in hand with the diagnosis of diabetes such as vision damage, nephropathy and even loss of protective sensation of the feet.

Neuropathy increases the susceptibility of the limb to develop foot complications. Hence this implies that purveying foot care services and adequate treatment can halt the plight of progression to an amputation.

Foot examination comprises of three chief elements: Taking a detailed patient history, physical investigation and lastly imparting patient education.

Patient's medical history serves as a guide for further physical analysis. Previous reports of blood glucose levels, the age of diabetes and prior complications provide a trajectory to evaluate the current scenario.

Hence, the patient should always be asked about their lifestyle measures, quality of sensation in the feet and any other associated history involving foot complications.

Patients who have maintained a less than optimum control of blood glucose levels hold a higher risk or are more vulnerable to foot ulcers and infections. General assessment involving the kind of footwear to be worn, aids in identifying in case need of any incorrect measures.

Next comes in the physical examination which can be categorized into four components: dermatologic, neurologic, musculoskeletal, and vascular exam.

A dermatologic test serves as the benchmark for detecting further problems which should commence with scrutinizing various skin conditions such as discoloration, corns, calluses, blisters and paronychia. Vascular insufficiency can also be ruled out looking for signs of loss of hair growth Toe inspection should be conducted to look out for signs of any fungal infections.

A neurologic assessment constitutes of:

Monofilament test which helps gauge foot sensitivity. Use of Tuning fork and the Virtual Perception Test: The vibrations of the tuning fork are placed on six different points of the feet to observe if the patient is able to feel the vibrations. A muscoskeletal examination should include looking for abnormalities such as hammer toe, claw toe or bunion since that hampers the stride of an individual and enhances the risk of falls.

A vascular assessment aids in analyzing adequate blood flow or circulation to the feet. Hence a Doppler Ultrasound should also be performed to check for a reduced or absent pulse.

Lastly, but most importantly patient education is the most crucial step in stalling the progression of any foot conditions. Research studies highlight the fact patients do not have the required knowledge on foot care measures and hence must be guided accordingly.

Besides, it is also the patient should be guided to responsibly perform a self-care exam daily. Looking for any irregularities and washing of feet gently are crucial standpoints. Additionally, maintaining blood glucose levels in range, adhering to a disciplined lifestyle, quitting smoking and ensuring use of proper footwear also equally important to ensure healthy feet.

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QUESTION AND ANSWERS

Q. Why is it so important for people with diabetes to control their blood pressure and cholesterol as well?

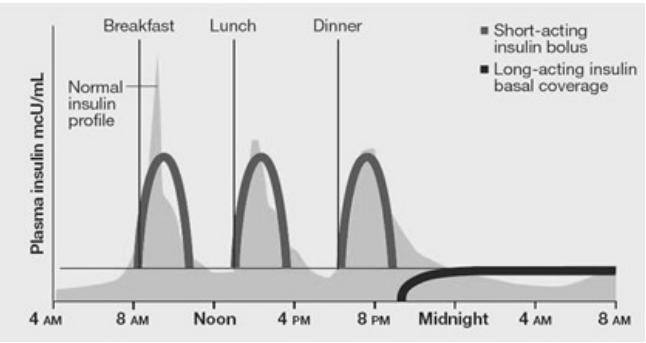
A. High blood pressure and abnormal levels of cholesterol and other blood fats are frequently found in people with diabetes and contribute additional risk for vascular disease. In some studies involving people with Type 2 diabetes, control of blood cholesterol and blood pressure has been found to confer greater protection against progression of microvascular disease. Not only that, but serious complications in the eyes, nerves, and kidneys caused by damage to the small blood vessels is seen to be reduced by treatment of blood cholesterol and blood pressure. Some of the drugs used for these conditions may provide an added benefit in blood glucose control too, while some may worsen it.

Q. What is the difference between basal insulin and bolus insulin?

A. Basal insulin refers to the insulin required to control blood glucose in the absence of food intake. A certain amount of insulin is always necessary to keep the blood glucose in the normal range, especially in the absence of eating for prolonged periods. Without any insulin in the body, starch, fat and protein in the body would break down with severe health consequences, as occurs in people with Type 1 diabetes. The quantum of insulin that the body requires in the absence of food intake is known as the basal requirement and it is usually provided by one or two injections of long-acting insulins that most patients give themselves daily. If a person is using an insulin pump, then the dosage required is covered by the basal setting on the pump. Modern insulin pumps offer several basal settings in each 24-hour period as the basal insulin production in even a healthy individual varies through the course of the day. It is higher in the 2 to 3 hour period before arising in the morning. Bolus insulin refers to the insulin required to remove the energy derived from a meal from the bloodstream and into the tissues, to replenish energy stores. This is typically provided by short-acting insulins given just prior to food consumption in meals or by the bolus setting on the insulin pump. Recently developed and marketed forms of insulin very closely match the pattern of insulin production from the pancreas itself in response to food. In this way, they are able to mimic this pattern and prevent the blood glucose from rising excessively after a meal, whilst also preventing occurrence of low blood glucose after it has been cleared from the bloodstream. The latest insulin pumps offer different rates and patterns in which the bolus can be given, in order to effectively deal with rapidly or more slowly absorbed type of foods. Figure 1 above shows the normal pattern in which the body releases insulin and describes how basal bolus, and supplemental insulin are given to mimic this as closely as possible. Of course, once it has been delivered to the body, the insulin cannot distinguish between basal and meal derived glucose and so different types of insulin preparation will overlap with each other in their action.

Figure 1:

Physiological Principles of the Basal/Bolus Insulin Regimen



Source: *Polonsky et al, 1988*

JJ

RECIPES

CHICK PEA TIKKIS

Ingredients

Soaked and boiled kabuli chana (white chickpea)	90 gm
Chopped mint leaves (pudina)	20 gm
Finely chopped green chillies	10 gm
Finely chopped capsicum	30 gm
Grated carrot	30 gm
Grated cabbage	30 gm
Grated garlic	2.5 gm
Roasted cumin seed (jeera) powder	2.5 gm
Salt to taste	
Oil	10 ml (2tsp)

For serving:

With green coriander chutney

Procedure:

1. Combine the kabuli chana, mint leaves and green chillies in a mixer and blend to a coarse mixture without using water
2. Transfer the mixture into a deep bowl, add all the remaining ingredients and mix well
3. Divide the mixture into 16 equal portions and shape each portion into 2 inch diameter round flat tikkis
4. Heat and grease a non-stick tava (griddle) using ¼ tsp of oil
5. Cook each tikki, using ¼ tsp of oil till they turn golden brown in colour on both sides
6. Serve immediately with green chutney

Provides 3 servings

Nutritional information per serving

Energy (kcal)	Carbohydrate (gm)	Protein (gm)	Fats (gms)	Calcium (mg)	Fiber (gm)	Glycemic Index
103	15	6	10	27	5	Medium

Special features:

- A healthy recipe for breakfast
- A high fibre and calcium rich recipe

MAKHANE KI KHEER

Ingredients

Fox nuts (makhana)	100 gm
Ghee	5 ml (1tsp)
Skim milk	150 ml
Sugar substitute	Sucralose
Saffron (kesar) strands	a few
Nutmeg (jaiphal) powder	2.5 gm
For the garnish:	
Pistachios slivers	10 gm

Procedure:

1. Heat the ghee in a broad non-stick pan, add the makhane and sautee on a medium flame for 3 to 4 minutes or till they turn crisp.
2. Remove from the flame, allow it to cool and blend in a mixer to a coarse powder. Keep aside
3. Boil the milk in a deep non-stick pan, reduce the flame to medium, add the coarsely crushed makhane, mix and cook for 20 minutes, or till the milk has reduced to half, while stirring and scraping the sides of the pan occasionally.
4. Add saffron and nutmeg powder, mix and cook on a medium flame for 1 more minute
5. Switch off the flame and allow it to cool completely and now add the sugar substitute, mix well.
6. Refrigerate the makhane ki kheer for atleast an hour and serve chilled after garnishing with pistachio.

Provides 4 servings

Nutritional information per serving

Energy (kcal)	Carbohydrate (gm)	Protein (gm)	Fats (gms)	Calcium (mg)	Fiber (gm)	Glycemic Index
518	70	13	10	310	5	Medium

Special features:

- A healthy recipe for dessert in lunch or dinner.
- A calcium rich recipe.

JJ

HOW KNOWLEDGEABLE ARE YOU?

1. Circle the statement that reflects the action of insulin:
   A. enhances lipogenesis
   B. inhibits glycogenolysis
   C. promotes protein synthesis
   D. all of the above
2. Of the following, who is at greatest risk for Type 1 diabetes?
   A. Someone with family members who have celiac and thyroid disease.
   B. Someone with family members who have Type 2 diabetes.
   C. Someone who is overweight and smokes cigarettes.
   D. Someone who has a history of severe and chronic hypoglycemia.
3. Glycogenolysis is metabolic conversion of:
   A. glycogen into glucose
   B. glucagon into glucose
   C. glucose into glycogen
   D. glucose into glucagon
4. Which statement best describes the differences between the characteristics of Type 1 and Type 2 diabetes:
   A. persons with Type 2 diabetes usually require lower doses of insulin because they have a milder form of diabetes.
   B. persons with Type 1 diabetes may be asymptomatic at the time of diagnosis, but rapidly develop complications.
   C. persons with Type 1 diabetes can increase endogenous insulin production by taking oral hypoglycemic agents.
   D. autoimmune factors are more likely to be a cause or contributing factor for Type 1 diabetes than for Type 2 diabetes
5. According to the ADA, people with Type 2 diabetes should be screened for microalbuminuria/ GFR:
   A. five years after diagnosis and then yearly
   B. at diagnosis and then yearly
   C. the onset of renal failure and then yearly
   D. with the first signs of hypertension and then yearly
6. Indicate which of the following conditions is a contraindication for metformin(Glucophage) therapy:
   A. thyroid disorders
   B. hypertriglyceridemia
   C. gout
   D. Advanced renal impairment
7. The fatty liver is:
   A. Is insulin resistant and therefore overproduces glucose and VLDL
   B. Is most often due to high protein diet
   C. Receives most of its free fatty acids from visceral adipose tissue
   D. Decreases by the same relative amount as body weight by weight loss
8. Excessive thirst and markedly increased volume of very dilute urine may be symptoms of:
   A. Urinary tract infection
   B. Diabetes insipidus
   C. Viral gastroenteritis
   D. Hypoglycemia
9. The leading cause of death for people with diabetes is:
   A. amputation
   B. kidney failure
   C. pancreatic neoplasm
   D. heart disease
10. Simple education can save problems with lower extremities. Which of the following is correct foot care advice?
    A. Soak your feet every day in warm water for 15 minutes
    B. Walk barefoot at home
    C. Apply lotion between the toes to prevent dry skin
    D. Quit smoking

ANSWERS:

1) D 2) A 3) A
4) D 5) B 6) D
7) A 8) B 9) D
10) D

MYTHS AND FACTS

1. **Myth: If one is exercising, then one has to take a protein shake or supplement**

   Fact: It is true that if one is exercising one does need protein. Our muscles need protein to grow and repair, and if the exercise undertaken is of high intensity, then one has to make sure that the protein intake is sufficient. What is more important, though, is the timing of that protein intake, which should ideally be within an hour of exercising. Body can only metabolise a certain amount of protein at a time, so overloading the protein shakes is futile. The goal should be to limit our protein intake to be consumed shortly after exercise so that the body can use it to help muscles to build and repair, rather than overdoing the protein shakes.

2. **Myth: Snacking is bad**

   Fact: If understood properly, it is a myth that one should not snack. Eating little and often is actually much better than eating three huge meals daily. Snacking is a good way to achieve this, and as it helps to prevent energy dips between the meals. The key lies in what one is snacking on –here one can utilise and understand information about fats and sugars. If one at 4pm opts for a slice of cake or sugar-packed processed foods like chips then the health benefits of snacking will be lost. Choose wisely, and go for healthy options like Chana, Fox nuts, fruit, fruit-based yoghurt that will help to fill the stomach.

3. **Myth: Vegetarian and Vegan diets are healthier**

   Fact: Avoiding red meat and high-fat dairy products means mainly avoiding saturated fat and preventing adverse health effects due to over-consumption of fatty cuts of meat and high-fat dairy products. However, vegan and vegetarian diets are only healthier if one replaces these foods with healthy and nutritionally balanced options. Replacing the meat and dairy in your diet with refined carbohydrates and sweets will not make the switch to vegetarianism or veganism a healthy one. A vegan diet can offer many health benefits, including better heart health, weight loss and a reduced risk of chronic diseases. Research also suggests that vegan diets are better for the environment. However vegan diets are low in protein and fat. Risk of Vitamin B12, iron, calcium and zinc deficiency exists. Vegan diets can be expensive and one needs to take supplements.

4. **Myth: Coconut oil is incredibly healthy for everyone?**

   Fact: Unfortunately, coconut oil is a saturated fat – the type of fat associated with it causes high cholesterol. Recent research has suggested, however, that the type of saturated fat present in coconut oil may be metabolised differently than other saturated fats, indicating that it may not have the similar adverse effects on blood cholesterol and general cardiovascular health. What is omitted by eating coconut oil, though, is the essential fatty acids found in unsaturated fats, fats that help to keep our healthy cholesterol levels intact and the fats that the body generally needs. While research show that saturated fatty acids in coconut oil may not be as undesirable, we may as well be eating a kindly fat which may be permitted in small quantities.

5. **Myth: Fresh produce is healthier than frozen produce**

   Fact: On the contrary, frozen foods can sometimes be healthier than fresh food! As fruit and vegetables ripen, their sugar content rises and their nutrient content deteriorates. But when fruit and vegetables are frozen quickly after harvest, which prevents this process and actively preserves the nutrients. Fresh fruit and vegetables are best eaten when fresh as most nutritious, but consuming frozen instead will do no harm. It is an easier and more reliable way of incorporating more vegetables into cooking in many situations.

JJ

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How will I get the course material?

All course material is available online on our website.

What are the course fees?

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Where can I get more information about this course?

Kindly visit our website **http://www.helpdefeatdiabetes.org** or you can get in touch with us on our email id: heldefeatdiabetesinfo@gmail.com.

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(For eligibility criteria: Check Website www.diabeteseducatorsindia.com)

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Address ……..……..

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Account type: Savings Account

Name of the bank: Bank of India

Account number: 006610110001734

IFSC Code: BKID0000066

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Signature

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Challenges in Diabetes Education 2022 places special emphasis on supporting educational initiatives that have the potential to improve and significantly revolutionize diabetes care, enhance self-management and/or support patients with Type 1 or Type 2 Diabetes Mellitus. The educator should describe an individual or group case history and identify the problem in diabetes education. Furthermore, s/he should describe the plan of education to resolve the issue, partly or totally. The issue described may be related to patient perceptions, knowledge, behaviors and implementation of advice given. S/He should describe her struggle in resolving the issue including her triumphs and failures, the methodologies used and ethical, socio-economic and behavioral aspects of the case.

General Rules and Regulations regarding the eligibility Criteria for the Award

- The applicant of the Award should be a citizen of India and member of Association of Diabetes Educators.
- The case discussion should be on the subject of Diabetes Education.

The best case chosen by a group of referees will be awarded "Challenges in Diabetes Education Award- 2022" - which will carry a cash prize of Rs 10,000. The awardee will get the opportunity to present the case in the annual meeting of Association of Diabetes Educators and publish it in the journal of Diabetes Education.

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***OAD:** Oral Antidiabetic Drugs

Reference: Standl E, et al. Diabetes Care. 2016; 39(Suppl 2): S172-S179.

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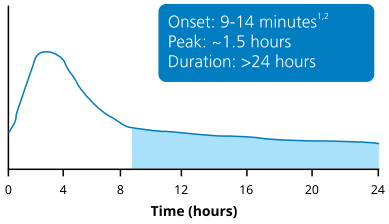

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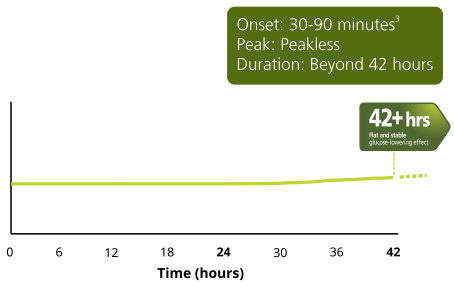

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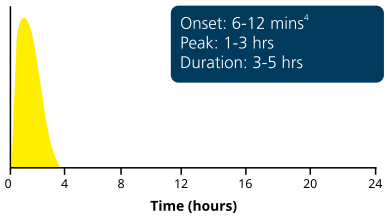

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