Diabetes Education SERVICES

CELEBRATING 20 OVER 20 YEARS

Welcome to Diabetes in the 21st Century

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www.DiabetesEd.net

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1

Diabetes in the 21st Century:
A Clinical and Educational Update

1. Describe impact of diabetes
2. Discuss prevention, management strategies
3. Discuss different types of diabetes
4. Describe insulin therapy
5. Gain understanding of Type 2 Meds.
6. Review glucose patterns and determine how to adjust therapy to improve glucose.
7. Discuss gut bacteria and healthy eating
8. Demonstrate successful teaching strategies

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2

CDC Announces

35% of Americans will have Diabetes by 2050

Boyle, Thompson, Barker, Williamson
2010, Oct 22:8(1)29
www.pophealthmetrics.com

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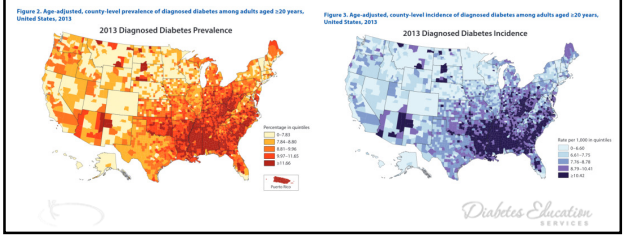
3

Diabetes in America 2020

- 30.3 million or > 9.4%
- 27% don't know they have it
- 37% of US adults have pre diabetes (846mil)



4

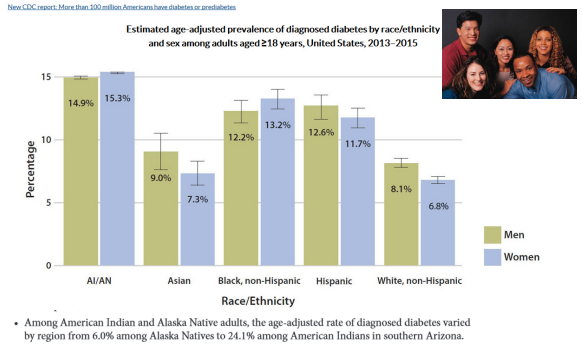
Global Epidemic

- Every 10 seconds
  - 1 person dies with diabetes
  - 2 people develop diabetes
- Every year
  - 3 million deaths
  - 6 million new cases
- World Diabetes Day is November 14
- March is ADA Sound the Alert Day "find people w/ undetected diabetes"

5

Age-adjusted Diabetes Prevalence

18 yrs or older, by race/ethnicity— U.S. 2015



- Among American Indian and Alaska Native adults, the age-adjusted rate of diagnosed diabetes varied by region from 6.0% among Alaska Natives to 24.1% among American Indians in southern Arizona.

6

Why Should Zip Code Determine Life Expectancy?

California Endowment – look up your zip code at www.measureofamerica.org

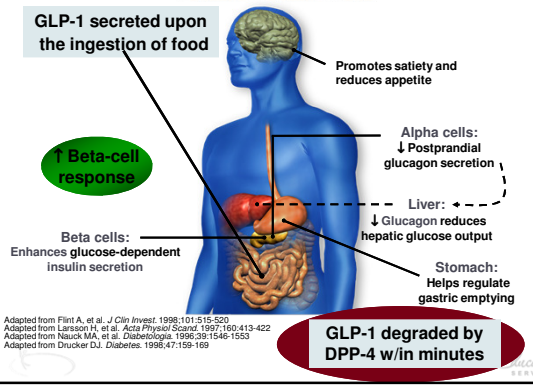
7

Hormones Effect on Glucose

Hormone	Effect
Glucagon (pancreas)	↑
Stress hormones (kidney)	↑
Epinephrine (kidney)	↑
Insulin (pancreas)	↓
Amylin (pancreas)	↓
Gut hormones - incretins (GLP-1) released by L cells of intestinal mucosa, beta cell has receptors)	↓

8

GLP-1 Effects in Humans
Understanding the Natural Role of Incretins



Adapted from Flint A, et al. *J Clin Invest.* 1998;101:515-520
Adapted from Larsson H, et al. *Acta Physiol Scand.* 1997;160:413-422
Adapted from Nauck MA, et al. *Diabetologia.* 1996;39:1546-1553
Adapted from Drucker DJ. *Diabetes.* 1998;47:159-169

9

GLP-1 Receptor Agonists & Injectables

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Class/Main Action	Name	Dose Range	Considerations
GLP-1 Receptor Agonist (GLP-1 RA) **"Incretin Mimetic"** • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon	exenatide (Byetta)	5 and 10 mcg BID	**Side effects for all:** Nausea, vomiting, weight loss, injection site reaction. Report signs of acute pancreatitis (severe abdominal pain, vomiting), stop med. Renally excreted. **Black box warning:** Thyroid C-cell tumor warning for exenatide XR, liraglutide, dulaglutide, and semaglutide (avoid if family history of medullary thyroid tumor). *Significantly reduces risk of CV death, heart attack, and stroke. Lowers A1c 0.5 – 1.6% Weight loss of 1.6 to 6.0kg†
	exenatide XR (Bydureon)	2 mg 1x a week Pen injector - Bydureon BCise
	liraglutide (Victoza)*	0.6, 1.2 and 1.8 mg daily Approved for pediatrics 10 yrs +
	dulaglutide (Trulicity)*	0.75 and 1.5 mg 1x a week pen injector
	lixisenatide (Adlyxin)	10 mcg 1x a day for 14 days 20 mcg 1x day starting day 15
	semaglutide (Ozempic)*†	0.5 and 1.0 mg 1x a week pen injector
	(Rybelsus) Oral tablet	3, 7, and 14 mg daily in a.m. Take on empty stomach w/H2O sip
Amylin Mimetic • Slows gastric emptying • Supress glucagon	pramlintide (Symlin)	Type 1: 15 - 60 mcg; Type 2: 60 - 120 mcg immediately before major meals	For Type 1 or 2 on insulin. Severe hypoglycemic risk, decrease insulin dose when starting. **Side effects:** nausea, weight loss. Lowers A1c 0.5 – 1%

The information listed here are general guidelines only; please consult prescribing information for details. REV 12/2019 © 2020

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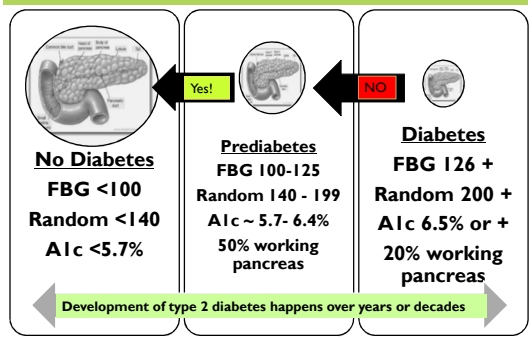
10

Natural History of Diabetes



11

Signs of Diabetes

- Polyuria
- Polydipsia
- Polyphasia
- Weight loss
- Fatigue
- Skin and other infections
- Blurry vision

- Glycosuria, H_2O losses
- Dehydration
- Fuel Depletion
- Loss of body tissue, H_2O
- Poor energy utilization
- Hyperglycemia increases incidence of infection
- Osmotic changes

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Diabetes Classifications

- Type 1
- Type 2
- Gestational
- Secondary

13

Case Study

1. Pt profile: 5'8", 192 lb male

Diabetes 12 years, on insulin 3 yrs

What type of DM and how do you know?

2. 5'6", 108 lb female

On insulin 3u Regular before meals, 10u NPH at bedtime

What type of DM and how do you know?

14

Type 1 Rates Increasing Globally

- 23% rise in type 1 diabetes incidence from 2001-2009
- Why?
  - Autoimmune disease rates increasing over all
  - Changes in environmental exposure and gut bacteria?
  - Hygiene hypothesis
  - Obesity?

15

Incidence of Type 1 in Youth

- **General Pop 0.3%**
- **Sibling 4%**
- **Mother 2-3%**
- **Father 6-8%**
- Rate doubling every 20 yrs
- Many trials underway to detect and prevent (Trial Net)

16

Type 1 – 10% of all Diabetes Genetics and Risk Factors

- Auto-immune pancreatic beta cells destruction
- Most commonly expressed at age 10-14
- Insulin sensitive (require 0.5 - 1.0 units/kg/day)

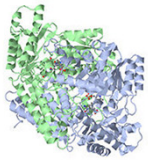
- Combo of genes and environment:
  - Autoimmunity tends to run in families
  - Higher rates in non breastfed infants
  - Viral triggers: congenital rubella, coxsackie virus B, cytomegalovirus, adenovirus and mumps.

17

Autoantibodies Assoc w/ Type 1

Panel of autoantibodies –

- GAD65 - Glutamic acid decarboxylase –
- ICA - Islet Cell Cytoplasmic Autoantibodies
- IAA - Insulin Autoantibodies



18

Type 1 Diabetes Associated with other immune conditions

- Celiac disease (gluten intolerance)
- Thyroid disease
- Addison's Disease
- Rheumatoid arthritis
- Other

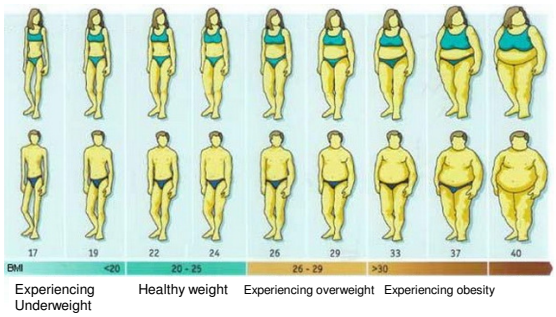
19

Type 1 Summary

- Autoimmune pancreatic destruction
- Need insulin replacement therapy
- Often first present in DKA
- At risk for other autoimmune diseases
- Eval coping strategies

20

BMI Categories



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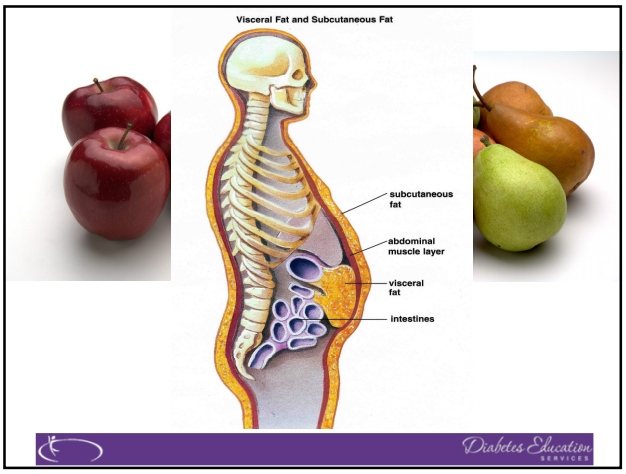
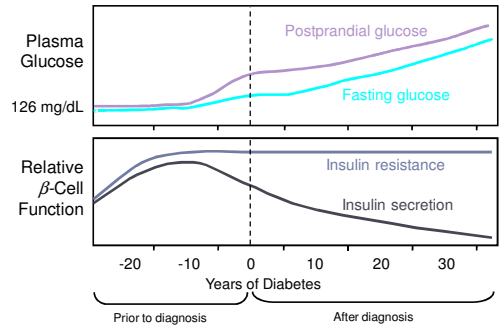


22

Natural Progression of Type 2 Diabetes



Adapted from Bergenstal et al. 2000; International Diabetes Center.

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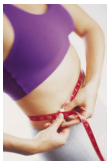
Cardio Metabolic Risk - 5 Hypers -

- Hyperinsulinemia (resistance)
- Hyperglycemia
- Hyperlipidemia
- Hypertension
- Hyper"waistline"emia (35" women, 40" men)



Manifestations of Insulin Resistance

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24

2. Classification and DM Diagnosis

- Pre Diabetes & Type 2- Screening Guidelines
- Start screening at age 45 or for anyone with excess weight (BMI ≥ 25, Asians BMI ≥ 23) with one or > additional **risk factor**:
  - First-degree relative w/ diabetes
  - Member of a high-risk ethnic population
  - Habitual physical inactivity
  - PreDiabetes
  - History of heart disease

25

Diabetes 2 - Who is at Risk?

(ADA Clinical Practice Guidelines)

Risk factors cont'd

- HTN - BP > 140/90
- HDL < 35 or triglycerides > 250
- history of Gestational Diabetes
- Polycystic ovary syndrome (PCOS)
- Other conditions assoc w/ insulin resistance:
  - Severe obesity, acanthosis nigricans (AN)
- Recheck every 3 years

26

Acanthosis Nigricans (AN)

- Signals high insulin levels in bloodstream
- Patches of darkened skin over parts of body that bend or rub against each other
  - Neck, underarm, waistline, groin, knuckles, elbows, toes
  - Skin tags on neck and darkened areas around eyes, nose and cheeks.
- No cure, lesions regress with treatment of insulin resistance

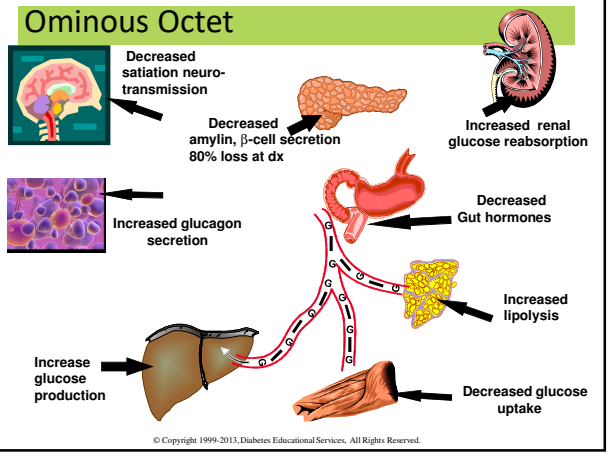
27

Diabetes Detectives Needed

- On average – takes 6.5 years to diagnose diabetes
- 1/4 of all people with diabetes don't know they have it
- 50% of Latino and Asians are undiagnosed

28

Ominous Octet



29

SGLT2 Inhibitors- "Glucoretics"

- **Action**: "Glucoretic" decreases renal reabsorption in the proximal tubule of the kidneys (reset renal threshold and increase glucosuria). Risk of ketoacidosis, Fournier's gangrene

Common Oral Diabetes Meds

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Class/Main Action	Name(s)	Daily Dose Range	Considerations
SGLT2 Inhibitors "Glucoretic" • Decreases glucose reabsorption in kidneys	Canagliflozin* (Invokana) Dapagliflozin* (Farxiga) Empagliflozin* (Jardiance) Ertugliflozin (Steglatro)	100 - 300 mg 1x daily Don't start if GFR <45. 5 - 10 mg 1x daily Don't start if GFR<45. 10 - 25 mg 1x daily Don't start if GFR <45. 5 – 15 mg 1x daily Don't start if GFR <60.	**Side effects:** hypotension, UTIs, increased urination, genital infections, ketoacidosis. **Monitor GFR and other considerations:** See package insert for dosing based on GFR. *Empagliflozin, Dapagliflozin, & Canagliflozin: - Reduce risk of CV death, heart failure and preserve long-term kidney function. Canagliflozin increases risk of amputation. Dapagliflozin, don't use in pts w/ bladder cancer. **Benefits:** no hypo or weight gain. Lowers A1c 0.6%-1.5%. Lowers wt 1-3 lbs.

30

Comparison of Type 1 and Type 2

Feature	Type 1	Type 2
Excess weight	x	xxx
Insulin dependence	xxx	30%
Respond to oral agents	x	xxx
Antibodies present	xxx	0
Typical age of onset	puberty	40-65
Insulin Resistance	x	xxx

31

Gestational DM ~ 7% of all Pregnancies

- GDM prevalence increased by
  - ~10–100% during the past 20 yrs
- Native Americans, Asians, Hispanics, African-American women at highest risk
- Immediately after pregnancy, 5% to 10% of GDM diagnosed with type 2 diabetes
- Within 5 years, 50% chance of developing DM in next 5 years.

32

Postnatal Health: Maternal Behavior

- Encourage breastfeeding for at least 6 mos
  - (Decreases risk of maternal diabetes 48%)
- Screening 6-12 weeks post partum using non-pregnant OGTT criteria (50%)
- Repeat at 3 yr intervals or signs of DM
- Encourage weight control and exercise
- Make sure connected with health care
- Preconception counseling
- Consider metformin for women with PreDiabetes and History of GDM

33

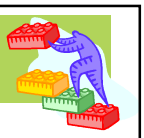
Metformin & GFR Guidelines

Class/Main Action	Name(s)	Daily Dose Range	Considerations
Biguanides • Decreases hepatic glucose output • First line med at diagnosis of type 2	metformin (Glucophage) Riomet (liquid metformin)	500 - 2500 mg (usually BID w/ meal) 500 - 2500mg 500mg/5mL	**Side effects:** nausea, bloating, diarrhea, B12 deficiency. To minimize GI Side effects, use XR and take w/ meals. **Obtain GFR before starting.** • If GFR <30, do not use. • If GFR <45, don't start Meformin • If pt on Metformin and GFR falls to 30-45, eval risk vs. benefit; consider decreasing dose. **For dye study,** if GFR <60, liver disease, alcoholism or heart failure, restart metformin after 48 hours if renal function stable. **Benefits:** lowers cholesterol, no hypo or weight gain, cheap. Approved for pediatrics, 10 yrs + Lowers A1c 1.0%-2.0%.
	Extended Release-XR (Glucophage XR) (Glumetza) (Fortamet)	(1x daily w/dinner) 500 – 2000 mg 500 – 2000 mg 500 – 2500 mg	

Biguanide derived from: Goat's Rue *Galega officinalis*, French Lilac

34

ADA Step Wise Approach to Hyperglycemia 2020



- **Step 1** – Metformin + Lifestyle
- **Step 2** - If A1c target not achieved after 3 months, Metformin + another med
  - If ASCVD, CHF, or CKD, consider adding a second agent to reduce risk based on drug effects and individual factors.
    - SGLT-2i - Empagliflozin (Jardiance), canagliflozin (Invokana) and dapagliflozin (Farxiga) – Eval GFR
    - GLP-1 RA Semaglutide > liraglutide > dulaglitide > exenatide > lixisenatide
- **Step 3** - If A1c target still not achieved after 3 months, combine metformin plus one to two other (2-3 drugs)
- **Step 4** - If A1c target not achieved after 3 months, add injectable therapy (GLP-1 RA or Basal insulin) to drug combination.

35

Other Causes of Hyperglycemia

- Steroids
- Agent Orange
- Tube feedings / TPN
- Transplant medications
- Cystic Fibrosis

Regardless of cause, requires treatment
- Insulin always works
- Sign of pancreatic malfunction

36

Diabetes is also associated with

- Fatty liver disease
- Obstructive sleep apnea
- Alzheimer's
- Depression
- Cancer; pancreas, liver, breast

37

DiaBingo

B Frequent skin and yeast infections
B A BMI of ____ or greater is considered overweight
B To reduce complications, control **A**1c, **B**lood pressure, **C**holesterol
B PreDiabetes – fasting glucose level of ___ to ____
B Erectile dysfunction indicates greater risk for ____
B Diabetes – fasting glucose level____ or greater
B Type 1 diabetes is best described as an _____ disease
B People with diabetes are _____ times more likely to die of heart dx
B Elevated triglycerides, < HDL, smaller dense LDL
B Each percentage point of A1c = _____ mg/dl glucose
B At dx of type 2, about __% of the beta cell function is lost
B Diabetes – random glucose ____ or greater

38

Self Reflective Question

- JR shows up to appointment, forgets their log book and meter and tells you they are only taking their daily insulin injection about 4 times a week.
- What feelings would that evoke?
  - Patient doesn't care
  - Non-compliant
  - Lazy
  - Better scare them
  - Exasperation

curiosity

39

Language of Diabetes Education

Old Way	New Way
Control diabetes	Manage
Test BG	Check
Patient	Participant
Normal BG	BG in target range
Non-adherent, compliant	Focus on what they are accomplishing
Refuse	Decided, chose

American Diabetes Association, Diabetes Care
The Use of Language in Diabetes Care and Education, 2017

40

Language of Diabetes Education

Old Way	New Way
Can't, shouldn't, don't, have to	Have you tried…" What about…" May I make a suggestion…"
Regimen	Plan, choices
Refused	Declined, Chose not to
Victim, suffer, stricken	..lives with diabetes …has diabetes

American Diabetes Association, Diabetes Care
The Use of Language in Diabetes Care and Education, 2017

41

Life Study – Mrs. Jones

Mrs. Jones is 62 years old, with a BMI of 36 and complains of feeling tired and urinating several times a night. She has an urinary tract infection. Her A1c is 8.3%, glucose 237.

She is hypertensive with a history of gestational diabetes. No ketones in urine.

- What are her risk factors and signs of diabetes?
- You find a few moments to teach and she asks you some questions.

42

Mrs. Jones asks you
What Do You Say?

- What is diabetes?
- They say I am a diabetic because I am obese?
- How am I going to control this?
- What is a normal blood sugar?
- Do I have to test my blood sugars?
- My doctor told me to stay away from white foods. Is that true?

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43

Mrs. Jones asks you
What Do You Say?

- You are wondering if your weight caused your diabetes?
- You can manage your diabetes and improve your health at the same time.
- For people without diabetes, fasting blood sugar is less than 100 and A1c is less than 5.7%
- Checking blood sugars can help you figure out if the plan in working.

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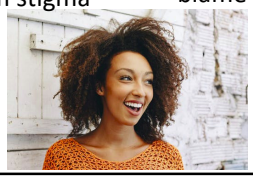
44

Let's use language that (is)

- Imparts hope
- Neutral, nonjudgmental
- Based on fact, actions or biology
- Free from stigma
- Respectful, inclusive
- Fosters collaboration between person and provider
- Avoids shame and blame



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Look Beyond Diabetes

- ACE – Adverse Childhood Experiences
- Feelings around their diabetes
- Cultural traditions, family system.
- Social, religious and employment influences
- Personal factors: attitudes, cognitive factors, literacy, learning styles, health beliefs
- Depression, anxiety
- Mental illness
- Addiction issues

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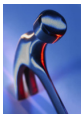
46

A1c and Estimated Avg Glucose (eAG) 2008

A1c (%)	eAG
5	97
6	126
7	154
8	183
9	212
10	240
11	269
12	298

Order teaching tool kit free at diabetes.org



eAG = 28.7 x A1c-46.7 ~ 29 pts per 1%

Translating the A1c Assay Into Estimated Average Glucose Values – ADAG Study
Diabetes Care: 31, #8, August 2008

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47

How Often Should I Check?

- Be realistic!!
- Type 2 on orals – Medicare covers 100 strips for 3 months
- Based on individual - Consider:
  - Types and timing of meds
  - Goals
  - Ability (physical and emotional)
  - Finances / Insurance

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48

Diabetes Wise – Non-Profit Site

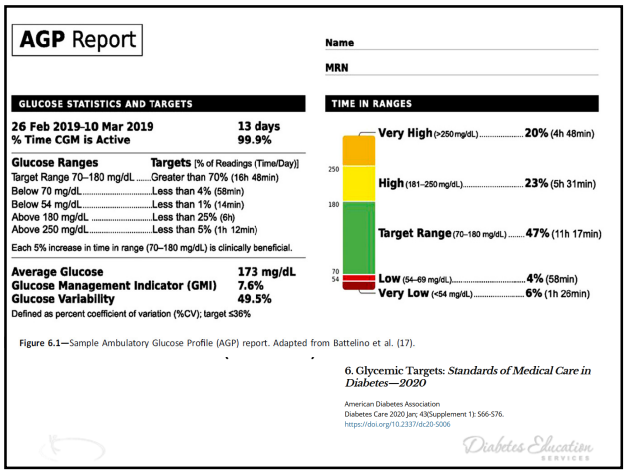
49

Ambulatory Glucose Report

- Standardized report with visual cues for those on CGM devices
- For most with type 1 or type 2 diabetes
  - > 70% of readings within BG range of 70-180mg/dL
  - < 4% of readings < 70 mg/dL
  - < 1% of readings < 54 mg/dL
  - < 25% of readings > 180 mg/dL
  - < 5% of readings > 250 mg/dL

- For under 25 years, with A_{1c} goal is < 7.5%, time-in-range target is set to about 60%.

50



AGP Report

Name

MRN

GLUCOSE STATISTICS AND TARGETS

26 Feb 2019-10 Mar 2019	**13 days**
% Time CGM is Active	**99.9%**

Glucose Ranges	**Targets** [% of Readings (Time/Day)]
Target Range 70–180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70–180 mg/dL) is clinically beneficial.

Average Glucose	**173 mg/dL**
Glucose Management Indicator (GMI)	**7.6%**
Glucose Variability	**49.5%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

- **Very High** (>250 mg/dL) **20%** (4h 48min)
- **High** (181–250 mg/dL) **23%** (5h 31min)
- **Target Range** (70–180 mg/dL) **47%** (11h 17min)
- **Low** (54–69 mg/dL) **4%** (58min)
- **Very Low** (<54 mg/dL) **6%** (1h 26min)

Figure 6.1—Sample Ambulatory Glucose Profile (AGP) report. Adapted from Battelino et al. (17).

6. Glycemic Targets: *Standards of Medical Care in Diabetes—2020*

American Diabetes Association
Diabetes Care 2020 Jan; 43(Supplement 1): S66-S76.
https://doi.org/10.2337/dc20-S006

51

When Treatment Goals Aren't Met

- Reassess treatment regimen and barriers
  - Competing demands including family responsibilities and dynamics
  - Literacy
  - Diabetes related distress or depression
  - Poverty
  - Culturally appropriate education?
  - Referral to social worker for assistance with insurance coverage
  - Medication taking behavior and regimen
  - Other?

52

Complications - Why?

- Degree of hyperglycemia "glucose toxicity"
- Duration of hyperglycemia
- Genes
- Multiple risk factors: smoking, vascular disease, dyslipidemia, hypertension, other

53

Diabetes Complications

- Heart disease leading cause of death.
- CAD death rates are about 2 -4x's as high as adults without diabetes (it's not getting better)
- Risk of stroke is 2 - 4 times higher
- 60% - 65% of people with DM have HTN.
- DM accounts for 40% of new cases of ESRD
- 60 - 70% have mild - severe forms of neuropathy
- Diabetes is the leading cause of blindness
- Accounts for 50% of lower limb amputations

54

Control Matters

- **Prevention**
- **Trials**
- **Practice Recommendations**

55

Financial Advisor

- Mid 30s, friendly, he smiles to greet you and you notice his gums are inflamed. You'd guess a BMI of 26 or so, with most of the extra weight in the waist area.
- If you could give him some health related suggestions, what would they be?

56

Can we stop pre diabetes from progressing?

3, 234 people w/ Pre-Diabetes randomized:

- Placebo
- Diet/Exercise or
- Metformin

over a three year period

Diabetes Prevention Program (DPP) 2001

57

Diabetes Prevention Program

- Standard Group - 29% developed DM
- Lifestyle Results - 14% developed DM
  - 58% (71% for 60yrs +) Risk reduction
    - 30 mins daily activity
    - 5-7% of body wt loss
- Metformin 850 BID - 22% developed DM
  - 31% risk reduction (less effective with elderly and thinner pt's)

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Weight loss and Prevention

- For every 2.2 pounds of weight loss, risk of type 2 diabetes was reduced by 13%.

NATIONAL Diabetes PREVENTION PROGRAM

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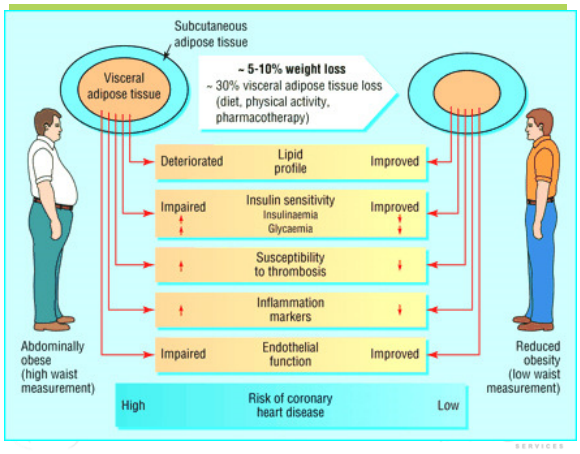

60

ABCs of Diabetes

- A1c less than 7% (avg 3 month BG)
  - Pre-meal BG 80-130
  - Post meal BG <180
- Blood Pressure < 140/90
- BP target <130/80
  - **If 10 year CVD Risk > 15%**
- Cholesterol
  - Statin therapy indicated?

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61

ABCs of Diabetes –

- A1c less than 7% (avg 3 month BG)
  - Pre-meal BG 80-130
  - Post meal BG <180
- Blood Pressure < 140/90
  - Goal 130/80 (If 10 year CVD risk > 15%, or has history of CV event) google ASCVD Risk Estimator
- Cholesterol
  - DM and 40 yrs, start statin
  - HDL >40
  - Triglyceride < 150

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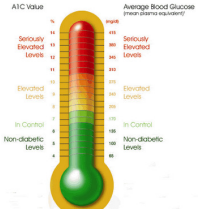
62

Glycemic Targets

- **Adult non pregnant A1c goals**
  - **A1c < 7%** - a reasonable goal for adults.
  - **A1c < 6.5%** - may be appropriate for those without significant risk of hypoglycemia or other adverse effects of treatment.
  - **A1c < 8%** - may be appropriate for patients with history of hypoglycemia, limited life expectancy, or those with longstanding diabetes and vascular complications.



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63

What are next steps?

- 72 yr old, thin, lives alone, A1c 7.3%. History of MI, stroke. DM for 12 yrs, "diet controlled". Creat 1.4.
- Concerns
- Meds?

64

DPP-4 Inhibitors – "Incretin Enhancers"

Januvia (sitagliptin) – Tradjenta (linagliptin)
Onglyza (saxagliptin) Nesina (alogliptin)

- **Action:**
  - Increase insulin release w/ meals
  - Suppress glucagon
- **Dosing**: Januvia – 100mg a day
  Onglyza* – up to 5mg a day
  Tradjenta – 5mg a day
  Nesina* – up to 25 mg a day
- **Efficacy:** Decreases A1c by 0.6 -0.8%
- **Benefits/ Issues**: weight neutral, no hypo, few side effects. Expensive

65

DPP-IV Inhibitor Updates

- Can cause severe, disabling join pain.
  - Contact Provider, Stop Medication
- Saxagliptin (Onglyza) and Alogliptin (Nesina) can increase risk of heart failure.
  - Notify provider for shortness of breath, edema, weakness, etc.

- Side effects: headache and flu-like symptoms
- Report signs of pancreatitis
- No wt gain or hypoglycemia
- Lowers A1c 0.6% - 0.8%

66

Exercise Standards

- Adults – 150 min/wk moderate intensity
  - over 3 days a week.
  - Don't miss > 2 consecutive days w/out exercise
  - Get up every 30 mins - Reduce sedentary time
  - Flexibility and balance training 2-3 xs a week (Yoga and Tai Chi)
  - T1 and T2 – resistance training 2 -3 xs a week

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67

A hard truth

- Exercise alone doesn't cause weight loss
- But….
  - It helps keep weight off
  - Decreases visceral adiposity
  - Decreases CV Risk

- To combat the rise in body weight, we need to change the food environment
- "You cannot outrun an unhealthy diet".

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68

Good Exercise Info / Quotes

- **"Passagiata" – take an after meal stroll**
- Exercise decreases A1c 0.7%
- No change in body wt, but 48% loss in visceral fat
  - ADA PostGrad 2010

"Every minute of activity lowers blood sugar one point."

"I don't have time to exercise, I MAKE time." Mike Huckabee

69

DiaBingo- G

G ADA goal for A1c is less than ____%

G People with DM need to see their provider at least every month

G Blood pressure goal is less than

G People with DM should see eye doctor (ophthalmologist) at least

G The goal for triglyceride level is less than

G Goal for my HDL cholesterol is more than

G The goal for blood sugars 1-2 hours after a meal is less than:

G People with DM should get this shot every year

G People with DM need to get urine tested yearly for _____

G Periodontal disease indicates increased risk for heart disease

G The goal for blood sugar levels before meals is:

G The activity goal is to do ___ minutes on most days

70

Diabetes Care Guidelines- ADA

Test / Exam	Frequency
A1c	At least twice a year
B/P	Each diabetes visit
Cholesterol (LDL, HDL, Tri)	Yearly (less if normal)
Vaccinations	Flu yearly, pneumonia
Weight	each diabetes visit
Microalbumin/GFR/Creat	Yearly
Eye exam	Yearly
Dental Care	At least twice a year
Comprehensive Foot Exam	Yearly (more if high risk)
Physical Activity Plan	As needed to meet goals
Preconception counseling	As needed

71

Mr. Jones - What are Your Recommendations?

Patient Profile

64 yr old with type 2 for 11 yrs. Hx of CVD.

Labs:

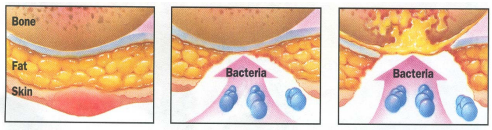
- A1c 9.3%
- HDL 37 mg/dl
- Triglyceride 260mg/dl
- Proteinuria - neg
- B/P 152/94

Self-Care Skills

- Walks dog around block 3 x's a week
- Bowls every Friday
- 3 beers daily
- *What meds?*
- *What referrals?*
- *My foot hurts*

72

Foot Wounds



Blisters
Calluses

Ulcers

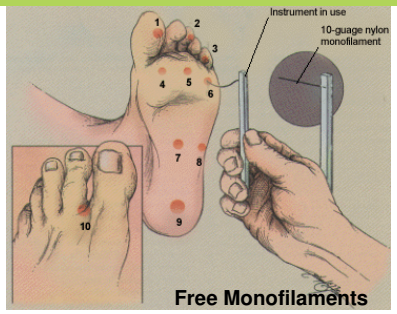
Bone infection

73

No Bathroom Surgery

74

5.07 monofilament = 10gms linear pressure



Free Monofilaments
http://www.hrsa.gov/leap/

75

Mr. Jones - What are Your Recommendations?

Patient Profile

64 yr old with type 2 for 11 yrs. Hx of CVD.

Current Status:

- A1c 9.3%
- On Metformin 500mg BID
- Partial foot amputation
- Lives alone
- What resources, teaching?

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76

Three Most Important Foot Care Tips

- Inspect and apply lotion to your feet every night before you go to bed.
- Do NOT go barefoot, even in your house. Always wear shoes!
- Every time you see your doctor, take off your shoes and show your feet.

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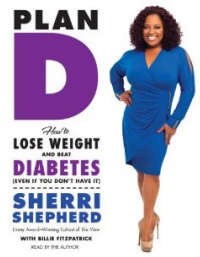
77

"Getting diabetes saved my life." ~ Sherri Sheperd



Sherri Shepard decided to embrace diabetes and use it as a motivator to improve her health.

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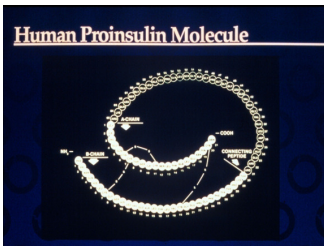
78

Insulin – the Ultimate Hormone Replacement Therapy

Objectives:

- Discuss the actions of different insulins
- Describe using pattern management as an insulin adjustment tool.



79

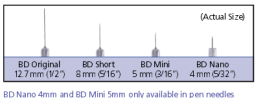
Psychological Insulin Resistance (PIR)

- 50% of providers in study threatened pts "with the needle".
- Less than 50% of providers realized insulins' positive effect on type 2 dm
- Most pts don't believe that insulin would "better help them manage their diabetes".
- Solutions: Find the root of PIR and address

Diabetes Attitudes, Wishes, Needs Study - Rubin

80

Needle Size often a Barrier Size *Does* Matter

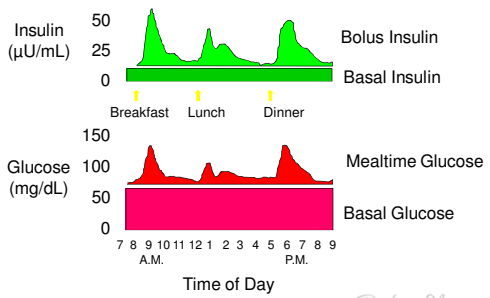


BD Nano 4mm and BD Mini 5mm only available in pen needles

- Use more short needles – 4 mm
- Effective for pts with BMI of 24- 49
- Keeps it subq
- If pt thin, inject at angle
- To avoid leakage, count to 10 before withdrawing needle
- ½ the patients who could benefit from insulin are not using it due to needle phobias

81

Physiologic Insulin Secretion: 24-Hour Profile



82

Insulin Action Teams

- Bolus: lowers after meal glucose levels
  - Very Rapid Acting – Aspart (Fiasp)
  - Rapid Acting
    - Aspart, Lispro, Admelog, Glulisine, Afrezza
  - Short Acting - Regular
- Basal: controls glucose between meals, hs
  - Intermediate
    - NPH
  - Long Acting
    - Detemir (Levemir)
    - Glargine (Lantus, Basaglar)
    - Degludec (Tresiba)

83

Case Study

- 70 yr old, weighs 100kg
- History of CABG, tobacco
- A1c – 11.3%, BG 400-500 for past weeks
- Insulin – 100+ units Lantus at hs (solostar)
- Oral Meds: Metformin, Invokana
- What is a better insulin dosing strategy?
- Can't afford insulin pen – what other option

84

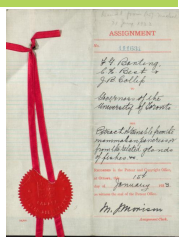
Bolus Insulins
(½ of total daily dose ÷ meals)

Name	Onset	Peak Action
Aspart (Fiasp)	2.5 min	1 hour
Aspart (NovoLog)	15-30 min	1-1.5 hrs
Lispro (Humalog, Admelog)		
Glulisine (Apidra)		
Afrezza (Inhaled)		
Regular	30 mins	2-4 hrs

85

Emergence of "Copy Cat" or "Biosimilar Insulins"

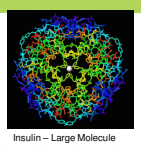
- Insulin considered a "biological drug product"
- Patent on "biologicals" last 12 yrs
  - Insulin patent sold in 1923 for $1
  - Patent can be extended by making small improvements
  - Insulin manufacturer's have maintained exclusivity for 93 years.. Until now
- Patents are expiring



86

Biosimilar Insulins : Lispro (Admelog) Glargine (Basaglar)

- Can't use the term generics for *large* molecule biologicals because they are manufactured in living organisms (bacteria and yeast)
- Each batch may be slightly different
- Currently - Pharmacist to contact Provider before switching to biosimilar
  - Future – may be same as generics



Insulin – Large Molecule

Aspirin – Small Molecule

87

Bolus Insulin Summary

- Regular, aspart, lispro, glulisine,
- Starts working fast (15-30 mins)
- Gets out fast (3-6 hours)
- Post meal BG reflects effectiveness
- Should comprise about ½ total daily dose
- Covers food or hyperglycemia.
- 1 unit
  - Covers ≈ 10 -15 gms of carb
  - Lowers BG ≈ 30 – 50 points

88

Bolus Insulin Timing

- How is the effectiveness of bolus insulin determined?
  - 2 hour post meal (if you can get it)
  - Before next meal blood glucose
- Glucose goals (ADA) – may be modified by provider/pt
  - 1-2 hours post meal <180
  - Before next meal – 80 - 130

89

Pattern Management –AKA

How to think like a pancreas

90

Pattern Management

- Safety 1st!! - Evaluate 3 day patterns
- **Hypo:** eval 1st and fix:
  - If possible, decrease medication dose
  - Timing of meals, exercise, medications
- **Hyperglycemia:** evaluate 2nd
  - Identify patterns
  - Before increase insulin, make sure not missing something (carbs, exercise, omission)

91

Bolus – Insulin Sliding Scale

Starts at 150, 2 units for every 50 mg/dl >150

	Break	Lunch	Dinner	HS
Day 1	94 no insulin	212 4 uR	148 no insulin	254 6 uR
Day 2	243 4uR	254 6 uR	201 4uR	199 no insulin
Day 3	189 2uR	243 4uR	162 2uR	244 4uR
Day 4	66 No insulin	287 6uR	144 none	272 6uR

92

Basal Insulins

(½ of total daily dose)

Intermediate Acting	Peak Action	Duration
NPH	4-12 hrs	12-24

Long Acting	Peak Action	Duration
Detemir (Levemir)	No Peak	20 hrs
Glargine (Lantus)		24 hrs
Glargine (Basaglar)		24 hrs
Degludec (Tresiba)		42 hrs

Fasting BG reflects efficacy of basal

93

Basal Insulin Summary

- NPH, Levemir, Lantus, Degludec
- Covers in between meals, through night
- Starts working slow (4 hours)
- Stays in long (12-24 hours)
  - NPH 12 hrs
  - Levemir, Lantus 20-24 hrs
  - Degludec – 42 hours

- Fasting blood glucose reflects effectiveness

94

Type 2 started on NPH 10 units hs. Newly discovered hyperglycemia.

- Blood Sugars

	AM	Lunch	Dinner	HS
Day 1	137	178	203	193
Day 2	96	154	167	182
Day 3	73	127	153	169
Day 4	61	193	133	152
Day 5?				

95

Basal + Metformin Type 2, 80kg – A1c 8.7%

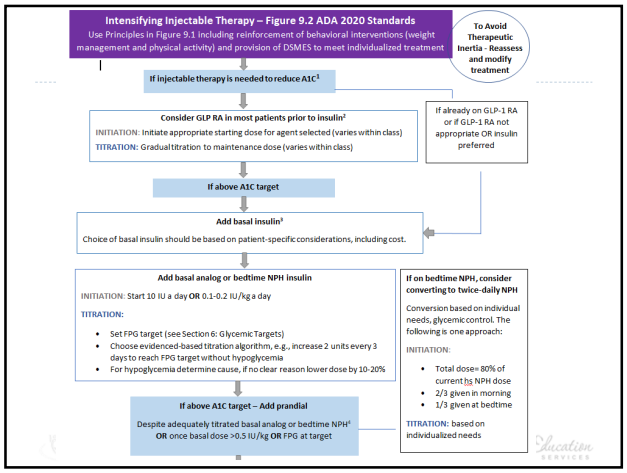
	Break	Lunch	Dinner	HS
Mo 1	170s			298 10u NPH
Mo 2	160s			233 10u NPH
Mo 4	140s	283	265	206 10u NPH

96

Next Steps

- When is it too much basal insulin?
  - If basal insulin is >0.5 units/kg day, advance to combination injectable therapy
    - Add bolus, switch premixed 70/30 or to Basal + GLP-RA
- Pt is at max basal dose
  - 80 x 0.5 = 40 units

97



98

Combo Sub-Q Insulin

Insulin Type	Onset	Peak
Humalog Mix 75/25: 75% NPL, 25% lispro 50/50: 50% NPL, 50% lispro	0.25 - 0.5 hr	0.5-6.5 hrs
NovoLog Mix 70/30: 70% NPA, 30% aspart	0.25 - 0.5 hr	1 – 4 hrs
NPH + Reg Combo 70/30: 70%N /30%R 50/50: 50%N /50%R	0.5 – 1.0 hr	2 - 16 hrs

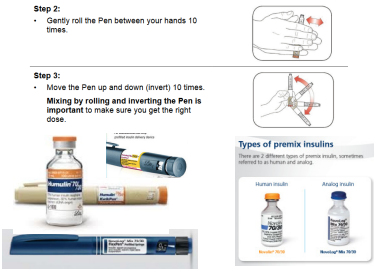
Considerations:

- Pre-mixed, difficult to fine tune therapy

99

70/30 Insulin

- Gently roll to mix insulin
- Prime pens – give 2 unit "air shot" to make sure pen and needle functional
- After injecting insulin, count to 5 before pulling needle out
- Use new needle with each injection



100

Next Steps – Switch from 40 units basal to 70/30 Insulin

- Switch to 70/30 Insulin
- Take current dose and give 2/3 in am and 1/3 in pm.
  - 2/3 of basal in am
    - 40 units x 0.6 = 24 units 70/30
  - 1/3 of basal in *pm
    - 40 units x 0.4 = 16 units 70/30
  - *pm = before dinner

101

24u 70/30 am, 16 u 70/30 pm Patterns? Changes needed?

	Break	Lunch	Dinner	HS
Day 1	102	63	92	181
Day 2	112	67	106	195
Day 3	98	56	112	201
Day 4	99	71	132	211

102

What Medications Cause Hypoglycemia?

- Insulin
- Sulfonylureas
- Meglitinides
- Or any combo medication that includes these

103

Sulfonylureas - Squirts

- Action: Increase endogenous insulin secretion throughout day
- Efficacy:
  - Decrease FPG 60-70 mg/dl
  - Reduce A1C by 1.0-2.0%
- Side Effects:
  - Weight gain, hypoglycemia
- Benefits:
  - Cheap, effective

104

Hypoglycemic Symptoms

- Autonomic
  - Anxiety
  - Palpitations
  - Sweating
  - Tingling
  - Trembling
  - Hypoglycemic Unawareness
- Neuroglycopenia
  - Irritability
  - Drowsiness
  - Dizziness
  - Blurred Vision
  - Difficulty with speech
  - Confusion
  - Feeling faint

105

Hypoglycemia (Glucose) Alert Values

- **BG <70mg/dl – Level 1**
- Follow 15/15 rule and contact provider make needed changes

- **BG < 54mg/dl – Level 2**
- Indicates serious hypo. Contact provider for med change. Glucagon Emergency Kit
- **Severe Hypoglycemia – Level 3**
- Requires external assistance – no threshold

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106

15 - 20 Gms Carb Sources

- 4 ounces apple juice
- 3 - 4 Glucose Tablets
- 8 - 10 Lifesavers candy
- 8 - 10 Hard candies
- 2 Tablespoons Raisins
- 4 - 6 oz's Nondiet soda
- 4 - 6 oz's Fruit Juice
- 8 oz Milk (non fat)

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107

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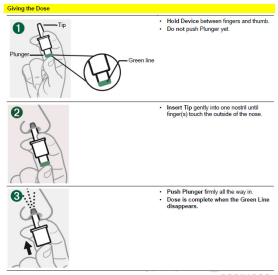
108

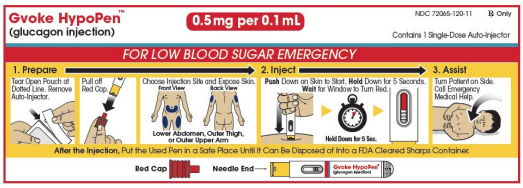
Nasal Glucagon - Baqsimi

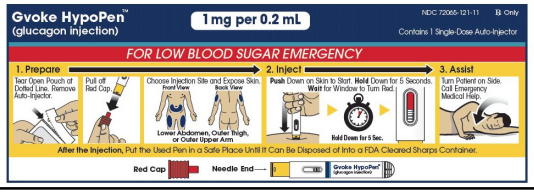
- Approved for ages 4 +
- Absorbed nasally
- No reconstitution or refrigeration needed
- Kept in temps up to 86
- Raises BG 67-73 mg/dl
- Don't use in those with
  - Pheochromocytoma
  - insulinoma



109

Gvoke HypoPen – Single dose injector





110

Basal Bolus – What Adjustments? Pt weighs 80kg

	Break	Lunch	Dinner	HS
Day 1	69 7R	79 5R	245 8R	190 22u NPH
Day 2	81 7R	87 5R	170 8R	133 22u NPH
Day 3	73 7R	94 5R	194 8R	110 22u NPH
Day 4	62 7R	83 5R	211 8R	127 22u NPH

111

Intensive Diabetes Therapy
Insulin Dosing Strategy

50/50 Rule

- 0.5-1.0 units/kg day
- Basal = 50% of total
  - Glargine QD
  - NPH or Detemir BID
- Bolus = 50% of total
  - usually divided into 3 meals

Example

- Wt 50kg x 0.5 = 25 units of insulin/day
- Basal dose: 13 units
  - Glargine 13 units QD
  - NPH/Detemir 6u BID
- Bolus dose: 12 units
  - 4 units NovoLog, Apidra Humalog, Regular each meal

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112

Intensive Diabetes Therapy
Insulin Dosing Strategy

50/50 Rule

- 0.5-1.0 units/kg day
- Basal = 50% of total
  - Glargine QD
  - NPH or Detemir BID
- Bolus = 50% of total
  - usually divided into 3 meals

Example – You Try

- Wt 60 kg x 0.5 = ___ units of insulin/day
- Basal dose: _____ units
  - Glargine ____ QD
  - NPH/Detemir __ BID
- Bolus dose: _____ units

____units NovoLog, Apidra Humalog, Reg each meal

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113

Basal Bolus – Using 50/50 Rule - Pt weighs 80kg

	Break	Lunch	Dinner	HS
Day 1	84 6R	89 7R	145 7R	190 20 u NPH
Day 2	81 6R	97 7R	107 7R	133 20u NPH
Day 3	79 6R	104 7R	124 7R	110 20u NPH
Day 4	69 6R	103 7R	208 7R	193 20u NPH

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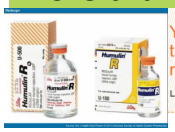
114

More than 200 units a day?



Your patients injecting more than 200 units of insulin per day may be ready for a change

LEARN MORE >

UNITS OF INSULIN **210** 260 335

- Maria* has type 2 diabetes with severe insulin resistance
- Her A1C is not at goal
- She is taking multiple insulin injections per day
- Approximately half of her current TDD of insulin is mealtime insulin and half is long-acting insulin

Indication for Humulin® R U-500

Humulin R U-500 (Concentrated) is indicated as an adjunct to diet and exercise to improve glycemic control in adults and children with type 1 and type 2 diabetes mellitus.

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115

Concentrated & Inhaled Insulins

DiabetesEd.net

Name/Concentration	Insulin/Action	Considerations
Humulin Regular U-500 • 500 units insulin/mL • KwikPen or Vial	Regular Bolus / Basal	5 xs concentration of u-100 insulin. Indicated for pts taking 200+ units insulin daily. 3 mL Pen – Once opened, good for 28 days. 20 mL Vial – Once opened, good for 40 days. Use designated U-500 insulin syringe.
Humalog KwikPen U-200 200 units insulin/mL	Lispro (Humalog) Bolus	2 xs concentration of u-100 insulin. 3 mL Pen. Once opened, good for 28 days
Toujeo Solostar U-300 Pen 300 units insulin/mL	Glargine (Lantus) Basal	3 xs concentration of u-100 insulin 1.5 mL Pen. Once opened, good for 42 days
Tresiba FlexTouch U-200 Pen 200 units insulin/mL	Degludec (Tresiba) Ultra basal	2 xs concentration of u-100 insulin 3 mL Pen. Once opened, good for 8 weeks

All concentrated insulin pens and the U-500 syringe automatically deliver correct dose (in less volume). No, conversion, calculation or adjustments required. For example, if order reads 30 units, dial the concentrated pen to 30 units or draw up 30 units on the U-500 syringe. **Important – never withdraw concentrated insulin from the pen using a syringe.**

Inhaled Insulin

Action	Insulin Name	Dose Range	Onset	Peak	Duration	Considerations
Bolus – Rapid-acting	Afrezza Inhaled regular human insulin	4, 8, and 12 unit cartridges before meals	15 min	1 hr	3 hrs	Assess lung function. Avoid in lung disease — bronchospasm risk. Side effects: hypo, cough, throat irritation.

The information listed here are not guidelines. Please consult prescribing information for details. REV 10/2016 ©2016

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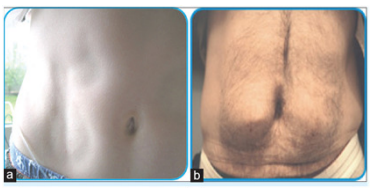
116

Insulin Teaching Keys

- Abdomen preferred injection site
- Stay 1" away from previous site
- Don't re-use syringes
- Keep unopened insulin in refrigerator
- Look for:
  - Lipodystrophy
  - Lipohypertrophy
- Make sure insulin isn't expired
- Proper disposal
- Review patients ability to withdraw and inject.



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117

Sharps Disposal: Product and Info

- Look in the Government section white pages for a household hazardous waste listing for your city or county.
- Call 1-800-CLEANUP (1-800-253-2687)
- Search for collection centers on the California Integrated Waste Management Board (CIWMB) Web site: http://www.ciwmb.ca.gov/HHW/HealthCare/Collection/
-

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118

DiaBingo - N

N DPP demonstrated that exercise and diet reduced risk of DM by__%
N Average A1c of 7% = Avg BG of ____
N An _____a day can help prevent heart attack and stroke
N Rebound hyperglycemia
N Scare tactics are effective at motivating patients to change behavio
N Losing ___ % of body weight, can improve blood glucose, BP, lipids
N Drugs that can cause hyperglycemia
N 2/3 cups of rice equals _____ serving carbohydrate

N One % drop in A1c reduces risk of complications by ___ %
N 1 gm of fat equal _____kilo/calories
N Metabolic syndrome = hyperinsulinemia, hyperlipidemia, hypertension
N Average American consumes 15 teaspoons of sugar a day.
N Medication that was derived from the saliva of the Gila Monster

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Standard American Diet is SAD

- 70% of food consumed is processed
- Low fiber, high sugar
- Intake of fruit and veggies decreasing
- We are starving our good bacteria

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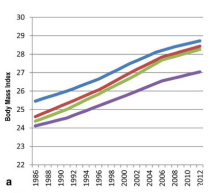
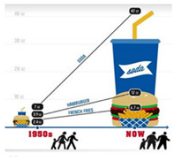
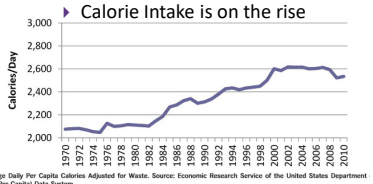
U.S. Weight - 68% experiencing overweight or BMI >30



- 34% BMI 25-29
- 34% BMI 30 +
- 1/3 of all people with extra weight don't get diabetes
- We burn 100 cals less a day at work
- Overall, food costs ~ 10-15% of income
- Calorie Intake is on the rise

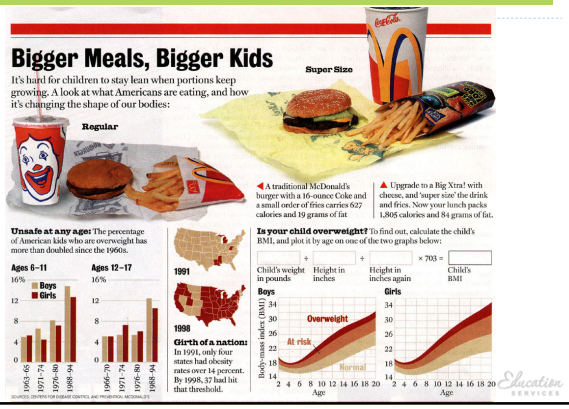




Average Daily Per Capita Calories Adjusted for Waste. Source: Economic Research Service of the United States Department ... bility (Per Capita) Data System.

121

Bigger Meals, Bigger Kids



122

Average American Consumes 22 teaspoons of added sugar a day

- WHO and AHA – Goal 6 teaspoons a Day
- 1 tsp = 4 gms sugar (15 cals)
- 15cals x 22 teaspoons a day =
  - 330 cals a day just from added sugars
- One soda has 12 tsps sugar
- New labels will list added sugar

123

Reduce refined Carbs, Added Sugars - ADA

- To control wt, reduce risk of CVD and fatty liver disease
- ADA strongly discourages consumption of:
  - Sugar sweetened beverages
  - Processed "low-fat" or "non-fat" foods with high amounts of refined grains & added sugar

Sugary and processed foods can displace healthier, more nutrient dense food choices

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Your health can only get better

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125

Bacterial Cells Outnumber Human Cells 10 to 1

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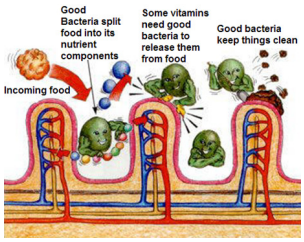
126

How do our bacteria help us?

- Maintain physiological homeostasis and metabolism.
- Other benefits
  - pathogen displacement
  - immune system development
  - barrier fortification
  - vitamin production
  - nutrient absorption
- Forgotten organ



127

Poll Question

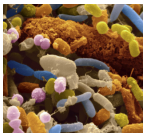
- How much does your gut bacteria weigh?

A. 24 ounces
B. 3 pounds
C. Less than 1 pound
D. 1.5 pounds
E . Not sure

128

3 lbs of Microbes in our Gut

- This community of bacteria can be thought of as an extra 'organ' "microbiome".
- We have evolved together with our microbiome over millions of years.
- Ratios of these communities has changed over the past 30 years
- Mirrors global spikes in obesity, diabetes, allergic and inflammatory diseases
- What are we doing to change these bacteria?



129

Quick Question

- In general, how does immigrating to the U.S. impact individual's gut microbiota?

A. Increased diversity due to new food exposure.
B. A generational decline in bacterial diversity
C. They experience a sudden increase in Akkermansia muciniphila
D. Decrease in helicobacter pylori.

130

HEALTH

Just Months of American Life Change the Microbiome

Immigrants' gut bacteria "westernize" soon after they move to the U.S., which might influence obesity in immigrants and Americans alike.

OLGA KHAZAN NOV 1, 2018 Atlantic.com Nov 2018

A Hmong woman carries grass in Vietnam. (NGUYEN HUY KHAM / REUTERS)

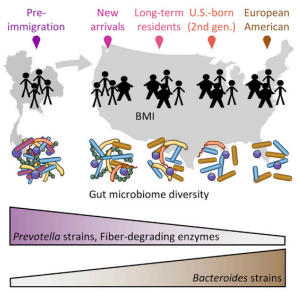
131

From Vietnam to America – Hmong immigrants microbiome shifts associated with worse health

- In Minneapolis—scientists followed a group of Hmong immigrants for 9 months.
- Increased intake of protein, sugar, and fat and processed food.
- Researchers found that the immigrants' gut microbiomes "westernized" and became less diverse
- Within a generation, Hmong women experiencing a BMI of >30 increased from 5% to 30%.

132

Moving to America isn't good for your health



Researchers don't know if eating a less-healthy diet increases the rate of obesity *and* changes the microbiome, or if a less healthy diet changes the microbiome *so* it makes people experience higher BMI.

Cell

Atlantic.com Nov 2018

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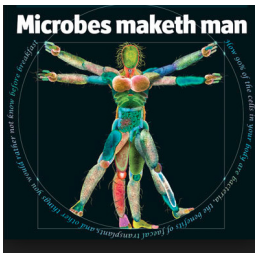
Gut Microbiome

- Part of endocrine axis
- Stabilized by 3 years of age
- Influenced by:
  - Birth method
  - Breast fed
  - Early Antibiotic use
  - Environment
  - Travel
- Help us
  - utilize energy
  - fight off invaders



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Getting to Better Gut Bacterial Health

Eat more PREbiotics

- Foods with indigestible fibers that nourish the good bacteria:
  - High fiber foods like, whole grains, fruits, veggies, nuts
  - High in prebiotic fibers include: Jerusalem artichokes, onions, kale, Brussels sprouts, bananas, dandelion greens & more

PRObiotics

- These foods contain healthy bacteria like *Bifidobacterium* and *lactobacillus.*
  - Yogurt, Kefir – look for "live or active cultures"
  - Fermented foods like: Sauerkraut, Kimchi, Miso soup, kombucha

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Follow Your Gut – Dr. Rob Knight

Check out Dr. Knight's:

- TED Talk
- Website – AmericanFoodProject .org
- Articles in Nature and all over

136

Take Home Message

- Get Dirty
- Limit Unnecessary C-Sections
- Breastfeed if possible
- Limit early antibiotics
- Eat a wide variety of fiber foods

137

Medical Nutrition Therapy – ADA

- Focus on the Individual
- Maintain pleasure of eating
- Provide positive messages about food
- Limit food choices only when backed by science
- Provide practical tools
- Refer to a RD and Diabetes Education – Lowers A1c by 1-2%

138

United States: The Revis family of North Carolina. Food expenditure for one week: $341.98. Favorite foods: spaghetti, potatoes, sesame chicken.
Peter Menzel, from the book, "Hungry Planet: What the World Eats."

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Guatemala: The Mendozas of Todos Santos - Food expenditure for one week: 573 Quetzales or $75.70. Family Recipe: Turkey... VIEW MORE
Peter Menzel, from the book, "Hungry Planet: What the World

19 of 27

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Medical Nutrition Therapy

- There is no single ideal dietary distribution of calories among carbohydrates, fats and proteins for those with diabetes.
- Individualize meal plans while keeping total calorie and metabolic goals in mind
- A variety of eating patterns are acceptable for type 2 and prediabetes.

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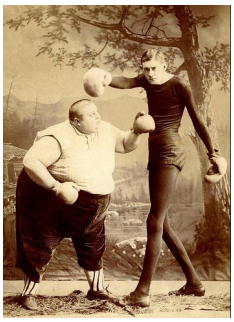
ADA MNT Standards 2020

Until there is more evidence:

- Emphasize non starchy vegetables
- Minimize added sugars and refined grains
- Choose whole foods over highly processed foods to the extent possible
- Healthful approaches include:
  - Mediterranean-style, low-carb and plant based or vegetarian
- Plate method good getting started approach
- Refer to RD/RDN

142

Approach Depends on Individual



- New Type 2
  - Portion Control
  - Plate Method
  - Record Keeping
  - Education
- On Insulin?
  - Carb counting
  - Post prandial checks

143

Move toward the Tomato

144

10 SuperFoods

- Beans
- Dark Green Leafy Vegs
- Citrus Fruit
- Sweet Potatoes
- Berries

- Tomatoes
- Fish High in Omega-3 Fatty Acids
- Whole Grains
- Nuts
- Fat-Free Milk and Yogurt

As posted on diabetes.org website

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Choose Healthy Carbs

- Carbs have fiber, vitamins, minerals and phytonutrients
- 25 gms of fiber a day
- Power Carbs include:
  - Beans
  - Veggies
  - Fruits
  - Whole grain foods

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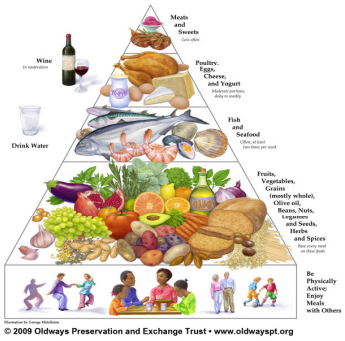
Mediterranean Diet Pyramid



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Another plate example

148

Successful weight loss strategies include

- Weekly self-weighing
- Eat breakfast
- Reduce fast food intake.
- Decrease portion size
- Increase physical activity
- Use meal replacements
- Eat healthy foods
- Drink Water
- Sleep

149

Weight Neutral Approach

- Encourages engagement in health promoting behaviors
- Directs clients to the practices to maintain their life, rather than the pursuit of wt loss
- Encourages body trust and acceptance
- Advocates for using wt neutral meds

150

Setting goals using weight neutral approach

- I will continue to care for my by body by doing [x].
- I will focus on small changes –such as testing my BG – instead of daily wts
- I will increase my self worth by telling myself "I am worth self-care"

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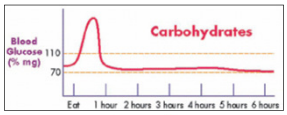
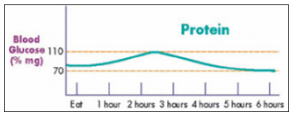
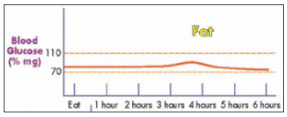
How nutrients affect blood sugar







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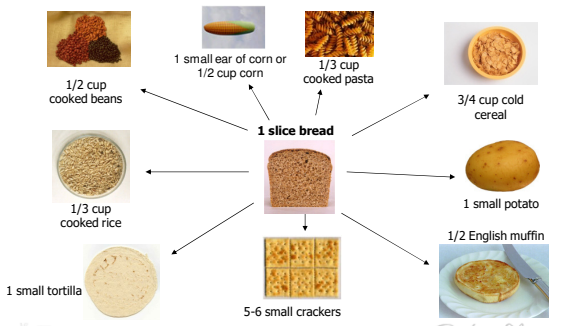
Carb Counting - Starch

Each Food has:
80 Calories
15 grams carb



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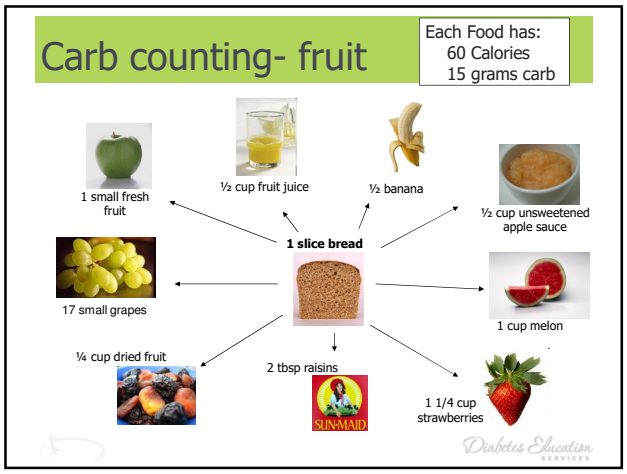
Carb counting- fruit
Each Food has:
60 Calories
15 grams carb
1 small fresh fruit
½ cup fruit juice
½ banana
½ cup unsweetened apple sauce
1 slice bread
17 small grapes
1 cup melon
¼ cup dried fruit
2 tbsp raisins
1 1/4 cup strawberries
SUN-MAID
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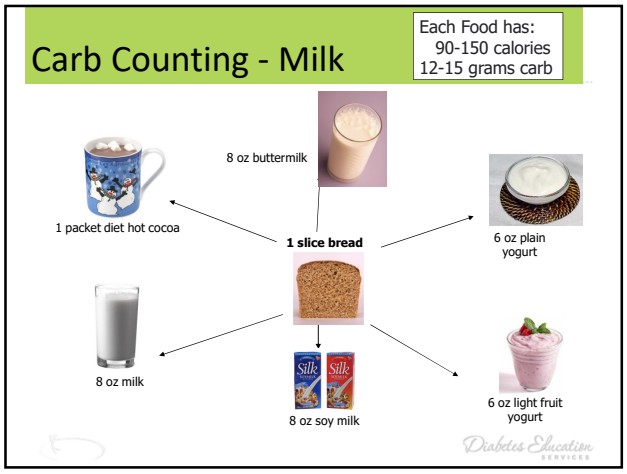
Carb Counting - Milk
Each Food has:
90-150 calories
12-15 grams carb
8 oz buttermilk
1 packet diet hot cocoa
1 slice bread
6 oz plain yogurt
8 oz milk
Silk
8 oz soy milk
6 oz light fruit yogurt
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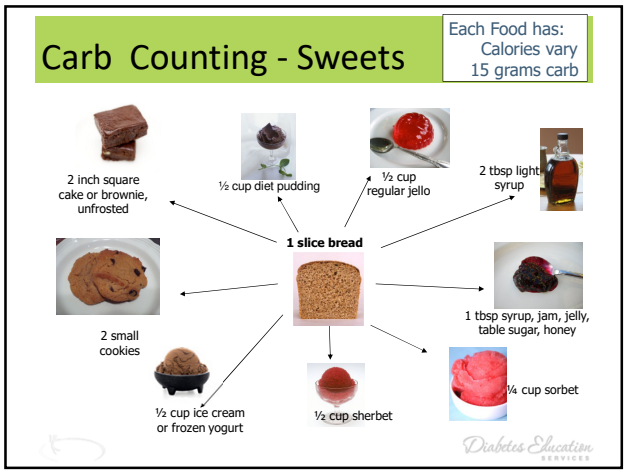
Carb Counting - Sweets
Each Food has:
Calories vary
15 grams carb
2 inch square cake or brownie, unfrosted
½ cup diet pudding
½ cup regular jello
2 tbsp light syrup
1 slice bread
2 small cookies
1 tbsp syrup, jam, jelly, table sugar, honey
½ cup ice cream or frozen yogurt
½ cup sherbet
¼ cup sorbet
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Using Alcohol Safely

- Women- 1 or fewer alcoholic drinks a day
- Men 2 or fewer alcoholic drinks a day
  - 1 alcoholic drink equals
    - 12 oz beer, 5 oz glass of wine, or 1.5 oz distilled spirits (vodka, gin etc)
- If drink, limit amount and drink w/ food.
- Ask HCP if safe for you to drink. Tell them your usual quantity and frequency.
- Can cause hypo and worsen neuropathy

157

Thank You

- Questions?
- Email bev@diabetesed.net
- Web www.diabetesed.net

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158