



DM Fundamentals – Class 4
Meds for Type 2

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**Diabetes Meds for Type 2:
Class 4**



1. Describe the main action of the different categories of type 2 diabetes medications.
2. Discuss strategies to determine the right medication for the right patient.
3. List the side effects and clinical considerations of each category of medication.

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Diabetes Agents Considerations

- ▶ Diabetes medications can be used as monotherapy, in combo or with insulin
- ▶ Combining agents from different classes has additive effect
- ▶ Most reduce A1c 0.5 – 2.0%
- ▶ Not to be used during preconception, pregnancy or when breastfeeding

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Patient Centered Approach

“...providing care that is respectful of and responsive to individual patient preferences, needs, and values - ensuring that patient values guide all clinical decisions.”

- Gauge patient’s preferred level of involvement.
- Explore, where possible, therapeutic choices.
- Utilize decision aids.
- **Shared** decision making – final decisions re: lifestyle choices ultimately lie with the patient.



ADA-EASD Position Statement: Management of Hyperglycemia in T2DM

Diabetes Care 2012;35:1364–1379
Diabetologia 2012;55:1577–1596



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Approach to the management of hyperglycemia

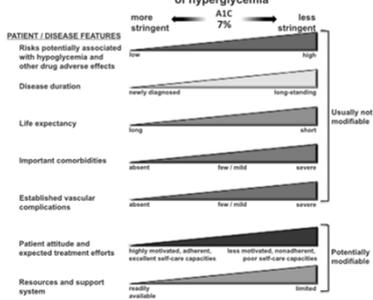


Figure 6.1—Depicted are patient and disease factors used to determine optimal A1C targets. Characteristics and predicaments toward the left justify more stringent efforts to lower A1C; those toward the right suggest less stringent efforts. Adapted with permission from Inzucchi et al. (45).

ADA Standards of Care 2015



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Antihyperglycemic Therapy – 1st Step

► Lifestyle Changes

- Weight control
- Healthy eating
- Activity



ADA-EASD Position Statement: Management of Hyperglycemia in T2DM

Diabetes Care 2012;35:1364–1379
Diabetologia 2012;55:1577–1596



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Action/Classes of Type 2 Meds

1. Suppressor Biguanide – Metformin
2. Squirter Sulfonylureas
 Meglitinides
3. Satiators AmylinoMimetics
 Incretin Mimetics
 DPP-4 Inhibitors
4. Sensitizer Thiazolidinediones (TZD)
5. Glucoretics SGLT2 Inhibitors
6. Circadian Switchers Dopamine Receptor
 Agonists
7. Slower Alpha-glucosidase inhibitors



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Oral Diabetes Medications



Class/Main Action	Name(s)	Daily Dose Range	Considerations
Biguanides • Decrease hepatic glucose output • First line med at diagnosis of type 2	metformin (Glucophage)	500 – 2500 mg (usually BID w/meal)	Side effects: nausea, bloating, diarrhea. Use XR to minimize. Lactic acidosis precaution: avoid in pts with creat > 1.4 women, 1.5 men, during illness or surgery. Benefits: decreased cholesterol, no wt gain or hypoglycemia. Lowers A1c 1.0% – 2.0%.
	Extended Release-XR (Glucophage XR)	(1x daily w/dinner) 500 – 2000 mg	
	(Glumetza)	500 – 2000 mg	
	(Fortamet)	500 – 2500 mg	
Sulfonylureas • Stimulates sustained insulin release	glyburide (Micronase, Diabeta) (Glynase)	1.25 – 20 mg 0.75 – 12 mg	Can take once or twice daily before meals. Side effects include hypoglycemia and weight gain. Eliminated via kidney. Caution: Glyburide most likely to cause hypoglycemia. Lowers A1c 1.0% – 2.0%.
	glipizide (Glucotrol) (Glucotrol XL)	2.5 – 40 mg 2.5 – 20 mg	
	glimiperide (Amaryl)	1.0 – 8 mg	
DPP – 4 Inhibitors • "Incretin Enhancers" • Prolongs action of gut hormones • Increases insulin secretion • Delays gastric emptying	sitagliptin (Januvia)	100 mg daily (eliminated via kidney)	*If creatinine elevated, see pig insert for dosing info. No wt gain or hypoglycemia. Side effects include nasopharyngitis, headache and upper-respiratory tract infection. Report signs of pancreatitis (abdominal pain, nausea, vomiting). Lowers A1c 0.6% – 0.8%.
	saxagliptin (Onglyza)	Up to 5 mg daily (eliminated via kidney, feces)	
	linagliptin (Tradjenta)	5 mg daily (eliminated via feces)	
	alogliptin (Nesina)	25 mg once daily (eliminated via kidney)	

More medications on back. Note: These meds are for people with Type 2 diabetes and should not be used during pregnancy. Content is for educational purposes only; please consult prescribing information for details. REV 12/2014 ©2014



Diabetes Education SERVICES

A Diabetes PocketCard™ from Diabetes Education Services

Class/Main Action	Name(s)	Daily Dose Range	Considerations
SGLT2 Inhibitors • Decrease glucose reabsorption in kidneys • "Glucoretic"	Canagliflozin (Invokana)	100 – 300 mg 1x daily	For all, monitor B/P, K+ and renal function. If GFR<45, stop Invokana. If GFR<60, stop Farigla. Do not start pts w/ GFR<45 on Jardiance. Side effects: hypotension, UTIs, increased urination, genital infections. Avoid Farigla in pts w/ bladder cancer. Lowers A1c 0.7% – 1.5%, lowers wt 1 – 3 lbs.
	Dapagliflozin (Farigla)	5 – 10 mg 1x daily	
	Empagliflozin (Jardiance)	10 – 25 mg 1x daily	
Thiazolidinediones "TZDs" • Increase insulin sensitivity	pioglitazone (Actos)	15 – 45 mg daily	Black Box Warning: TZDs may cause or worsen CHF. Monitor for edema and weight gain. Increased peripheral fracture risk. Actos may increase risk of bladder cancer. Lowers A1c 0.5% – 1.0%.
	rosiglitazone (Avandia)	4 – 8 mg daily	
Glucosidase Inhibitors • Delay carb absorption	acarbose (Precose)	25 – 100 mg w/meals;	Start low dose, increase at 4-8 wk intervals to decrease GI effects. Caution with liver or kidney problems. In case of hypo, treat w/ glucose tabs. Lowers A1c 0.5 – 1.0%.
	mgliotol (Glyset)	300 mg max daily dose	
Dopamine Receptor Agonists • Resets circadian rhythm	bromocriptine mesylate—Quick Release "QR" (Cycloset)	1.6 to 4.8 mg a day (each tab 0.8 mg)	Take within 2 hrs of waking. Side effects: nausea, headache, fatigue, hypotension, syncope, somnolence. Lowers A1c 0.6% – 0.9%.
Meglitinides • Stimulates rapid insulin burst	repaglinide (Prandin)	0.5 – 4 mg w/meals (metabolized in liver)	Take before meals. Side effects may include hypoglycemia and weight gain. Lowers A1c 1.0% – 2.0%.
	nateglinide (Starlix)	60 – 120 mg w/meals (eliminated via kidney)	



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Injectables That Lower Glucose

Class/Main Action	Name	Dose Range	Considerations
GLP-1 Agonist "Incretin Mimetic" • Increases insulin release with food • Slows gastric emptying • Promotes satiety • Suppresses glucagon Lowers A1c 0.5 – 1.6% Wt loss of ~ 3lbs	exenatide (Byetta)	5 or 10 mcg BID (renally excreted)	Side effects for all: Nausea, vomiting, weight loss, injection site reactions. Report signs of acute pancreatitis (severe abdominal pain, vomiting), stop med. Black box: Thyroid C-cell tumor warning for liraglutide, exenatide XR, albiglutide, and dulaglutide (avoid if family history of medullary thyroid cancer, notify MD of hoarseness, throat lump). For Type 1 or 2 on insulin.
	exenatide XR (Bydureon)	2mg 1x a week (renally excreted)	
	liraglutide (Victoza)	0.6 - 1.8 mg daily	
	albiglutide (Tanzeum)	30 and 60 mg 1x a week pen injector	
Amylin Mimetic • Slows gastric emptying • Suppresses glucagon • Promotes satiety Lowers A1c 0.5 – 1%	dulaglutide (Trulicity)	0.75 and 1.5 mg 1x a week pen injector	
	pramlintide (Symlin)	Type 1: 15-60 mcg Type 2: 60-120 mcg Immediately before major meals	

The information listed here are general guidelines only; please consult prescribing information for details.



Diabetes Education SERVICES

Ideal Diabetes Med -



- ▶ No hypoglycemia
- ▶ No weight gain
- ▶ Affordable
- ▶ Lowers CV risk
- ▶ Most people can tolerate /use?



Diabetes Education SERVICES

Biguanides – Suppressor Metformin (Glucophage®)

- ▶ Action: suppresses release of glycogen from the liver
- ▶ Who?
 - ▶ Fasting hyperglycemia
 - ▶ Dysmetabolic Syndrome
 - ▶ For pediatrics starting age 10
 - ▶ (XR age 17)



Glycogen Stopper and GLP Enhancer?



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Biguanides - Metformin

- ▶ **Action:** decrease hepatic glucose (glycogen)
- ▶ **Names:**
 - ▶ Metformin (Glucophage)
 - ▶ Starting dose: 500 BID, max 2500mg daily
 - ▶ Metformin extended release (3 different versions)
 - ▶ Starting dose 500mg at dinner, max dose 2000 to 2500 mg daily
- ▶ **Efficacy:**
 - ▶ Decrease fasting plasma glucose 60-70 mg/dl
 - ▶ Reduce A1C 1.0-2.0%



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Biguanides - Metformin

- ▶ **Benefits**
 - ▶ Decrease LDL cholesterol and triglycerides
 - ▶ No weight gain, possible modest weight loss
 - ▶ Cancer protective?
- ▶ **Concerns**
 - ▶ Diarrhea and abdominal discomfort – Use XR
 - ▶ Lactic acidosis if improperly prescribed
 - ▶ Watch for B12 deficiency
 - ▶ Hold prior to IV contrast dye studies and use caution during acute illness. Resume when kidney function adequate



Diabetes Education SERVICES

Considerations

Biguanide - Metformin (Glucophage®)

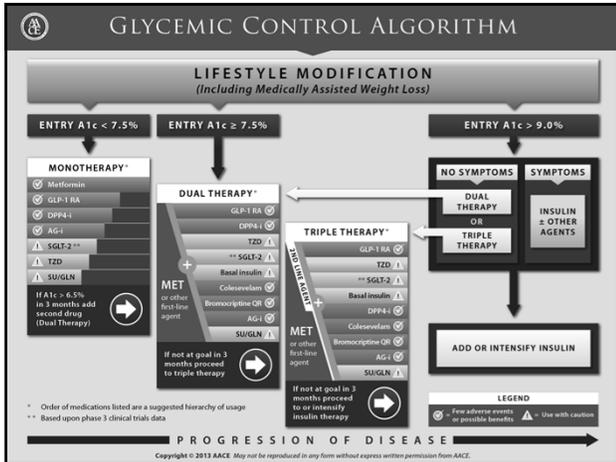
- ▶ **Contraindications due to risk of lactic acidosis:**
 - ▶ creatinine >1.4 females, >1.5 males
 - ▶ liver disease
 - ▶ alcohol abuse
 - ▶ over 80 years old
 - ▶ risk of acidosis
 - ▶ during IV dye study
 - ▶ CHF requiring meds



ADA Stds 2015 suggests GFR may be a more appropriate measure. If GFR <45, max dose is 1000mg a day. If GFR <30, stop metformin.



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Life Study

- ▶ 59 year old overweight woman with type 2 diabetes for past 3 years. Has been trying to control diabetes with diet and exercise.
- ▶ Most recent A1c 8.4%
- ▶ What medication would you consider? Labs?

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Sulfonylureas –

- ▶ Action: tells pancreas to squirt insulin all day
- ▶ Who?
 - ▶ Lean type 2

Diabetes Education SERVICES

Sulfonylureas - Squirts

- ▶ Action: Increase endogenous insulin secretion
- ▶ Efficacy:
 - ▶ Decrease FPG 60-70 mg/dl
 - ▶ Reduce A1C by 1.0-2.0%
- ▶ Secondary failures: 5-10% shortly after initial response, many more later
 - ▶ Usually after 5 or more years of therapy due to natural history of DM 2



Diabetes Education SERVICES

Sulfonylureas: 2nd Generation

<u>Generic</u>	<u>Trade</u>	<u>Duration</u>
▶ Glyburide	Diabeta, Micronase, <small>most likely to cause hypo – last choice</small>	12-24 hrs
▶ Glipizide*	Glucotrol, Glucotrol XI	12-24 hrs
▶ Glimepiride	Amaryl	16-24 hrs



Diabetes Education SERVICES

Sulfonylureas

- ▶ Other Effects
 - ▶ Hypoglycemia
 - ▶ Weight gain
 - ▶ Cleared by kidney, use caution for pts with kidney problems
 - ▶ Generally the least expensive class of medication
 - ▶ Amaryl safest for those with CV Disease



Diabetes Education SERVICES

Indication for “Fast Acting” Insulin Secretagogues- Meglitinides

- ▶ Action: tells pancreas to squirt insulin with meals
- ▶ Who?
 - ▶ Targets post-prandial hyperglycemia



Diabetes Education SERVICES

When goal is to minimize cost

- ▶ Go generic. Metformin and Sulfonylureas
- ▶ Walmart offers 3 month supply of following meds for ~ \$10
 - ▶ Metformin and Metformin XR
 - ▶ Glipizide, Glyburide, Glimepiride
- ▶ Other generics include
 - ▶ Actos and Avandia
 - ▶ Acarbose
 - ▶ Can still cost up to \$100 a month
- ▶ [Meds on a Budget Article](#)



Diabetes Education SERVICES

Meglitinides - Squirts

- ▶ **Action:** stimulate insulin secretion (rapid and short duration) when glucose present
- ▶ **Names:**
 - ▶ repaglinide (Prandin)
 - ▶ **Dosing:** 0.5 to 4 mg a.c. Max dose 16mg
 - ▶ Metabolized by liver and mostly excreted in feces (some renally).
 - ▶ nateglinide (Starlix)
 - ▶ **Dosing:** 120 mg tid with meals
 - ▶ Metabolized by liver, excreted by kidney
- ▶ **Efficacy:**
 - ▶ Decreases peak postprandial glucose
 - ▶ Decreases plasma glucose 60-70 mg/dl
 - ▶ Reduce A1C 1.0-2.0%



Diabetes Education SERVICES

Meglitinides

- ▶ Other Effects
 - ▶ Hypoglycemia (less than with sulfonylureas if patient has a variable eating schedule)
 - ▶ Minimal weight gain
 - ▶ No significant effect on plasma lipid levels
 - ▶ Safe at higher levels of serum Cr than sulfonylureas



Diabetes Education SERVICES

Squirters – How does they rate?

<u>Question</u>	<u>Answer</u>
▶ Cause hypoglycemia?	Yes
▶ Cause weight gain?	Yes
▶ Affordable?	Yes
▶ Lowers CV risk?	No
▶ Can most tolerate /use?	Yes/No



Diabetes Education SERVICES

What questions?

- ▶ 72 yr old, thin, lives alone, A1c 7.3%. History of MI, stroke. DM for 12 yrs, “diet controlled”. Limited income. Creat 1.4.



Diabetes Education SERVICES

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%

▶ **Indication:**

For type 2s



Diabetes Education SERVICES

DPP-4 Inhibitors – “Incretin Enhancers”

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

- ▶ Januvia, Onglyza eliminated via kidney, lower dose needed
- ▶ Do not cause wt gain or hypoglycemia
- ▶ Side effects – headache, runny nose, sore throat - watch for pancreatitis
- ▶ Cost \$100 - \$150 mo



Diabetes Education SERVICES

DPP-IV Inhibitors – How do they rate?

Question	Answer
▶ Cause hypoglycemia?	No
▶ Cause weight gain?	No
▶ Affordable?	No
▶ Lowers CV risk?	No
▶ Can most tolerate /use?	Yes



Diabetes Education SERVICES

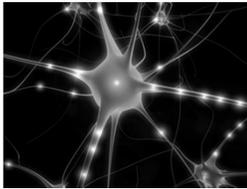
If on Metformin and Sulfonylurea –
A1c 8.4 - Pt struggling with weight



Diabetes Education
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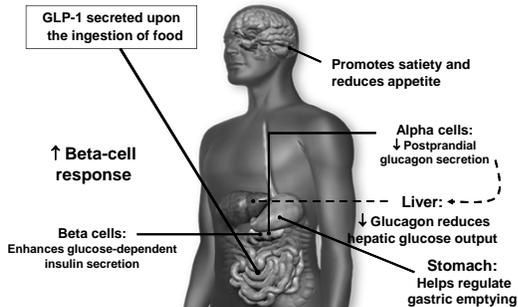
Incretin Mimetics –
“Gut Hormone Imitators”
GLP-1 Agonists

▶ How do they work?



Diabetes Education
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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 PMA, et al. Diabetes. 1998;47:1546-1553
Adapted from Drucker DJ. Diabetes. 1998;47:159-169

GLP-1 degraded by
DPP-4 w/in minutes



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Incretin Mimetics

Exenatide (Byetta), Exenatide XR (Bydureon)

▶ Action:

- ▶ Insulin release in response to meal
- ▶ Slows gastric emptying
- ▶ Causes Satiety
- ▶ Protects Beta Cells

▶ Exenatide Dosing:

- ▶ 5-10 mcg before break, dinner
- ▶ Long acting version - 1x week (available in pens in 2015)

▶ Efficacy: Decreases A1c by 0.7%, wt by 3lbs

▶ Indication: For type 2s only - mono or in combo



Diabetes Education SERVICES

Incretin Mimetics —

Exenatide XR - Bydureon

▶ Once a Week Dosing: 2mg

▶ Efficacy: Decreases A1c by 1.6%, wt by ~6lbs

▶ Indication: For type 2s only

▶ Other: – Available in pen

▶ Caution:

- ▶ not indicated for pt's w/ history of medullary thyroid tumor
- ▶ pancreatitis warning



Diabetes Education SERVICES

Incretin Mimetics —

Albiglutide - Tanzeum

▶ Once a Week Dosing: 30 – 50mg

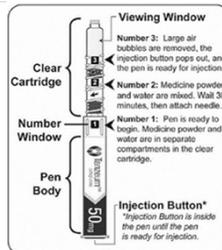
▶ Efficacy:

Decreases A1c by ~ 1%, wt by ~2lbs

▶ Indication: For type 2s only

▶ Other: Pen injector

▶ Caution: not indicated for those with history of medullary thyroid tumor - pancreatitis warning



Diabetes Education SERVICES

Incretin Mimetics - GLP-1 Analog
dulaglutide (Trulicity)

Dulaglutide Dosing: 0.75/ 1.5 mg weekly

- ▶ **Efficacy:** lowers; A1c by ~ 1%, body wt by ~ 2.5kg
- ▶ **Indication:** Type 2 Monotherapy or in combo.
- ▶ **Other:** it comes in a single-dose pen and does not require mixing, measuring or needle attachment. And the needle is hidden from the user and retracts after use.
Black box—thyroid tumor warning (avoid if family hx, notify MD of hoarseness, lump).



Diabetes Education SERVICES

Incretin Mimetics - GLP-1 Analog
Liraglutide (Victoza)

Liraglutide Dosing: 1x daily, time not critical

- 0.6 x 1 week – if tolerated (nausea), go to >
- 1.2 x 1 week – if tolerated go to >
- 1.8 mg daily
- ▶ **Efficacy:** lowers; A1c by 1%, body wt by ~ 2.5kg
- ▶ **Indication:** Monotherapy or in combo . Type 2 only
- ▶ **Other:** In pen



Black box—thyroid tumor warning (avoid if family hx, notify MD of hoarseness, lump).



Diabetes Education SERVICES

Liraglutide Approved for Weight Loss

- ▶ Saxenda and Victoza contain the same active ingredient (liraglutide) at different doses
 - ▶ Saxenda 3 mg and Victoza 1.8 mg
- ▶ Saxenda – as a treatment option for chronic weight management in addition to a reduced calorie diet and physical activity.
- ▶ Saxenda is approved for use in adults with a
 - ▶ BMI of ≥ 30 or
 - ▶ BMI of ≥ 27 or greater who have hypertension, type 2 diabetes, or dyslipidemia.



Diabetes Education SERVICES

For all the Previous GLP-1 Agonists

• Pancreatitis

Warning

- Please tell all patients to report signs right away and discontinue meds
- Signs include:
 - Sudden abdominal pain, nausea and vomiting



Diabetes Education SERVICES

Incretin Mimetics – How do they rate?

<u>Question</u>	<u>Answer</u>
▶ Cause hypoglycemia?	No
▶ Cause weight gain?	No
▶ Affordable?	No
▶ Lowers CV risk?	No
▶ Can most tolerate /use?	Yes/No (GI)



Diabetes Education SERVICES

What questions?

- ▶ 69 year old male, BMI 25, on Metformin 1000mg BID and Exenatide 10mcg before breakfast and dinner.
- ▶ A1c 8.1%. Creat 1.2
- ▶ Pt is overweight, 11 yr history of diabetes



Diabetes Education SERVICES

SGLT2 Inhibitors- “Glucoetics”

- ▶ **Action:** “Glucoetic” decreases renal reabsorption in the proximal tubule of the kidneys (reset renal threshold and increase glucosuria)

Name(s)	Daily Dose Range	Considerations
Canagliflozin (Invokana)	100 – 300 mg 1x daily	For all, monitor B/P, K+ and renal function. If GFR<45, stop Invokana. If GFR<60, stop Farxiga. Do not start pts w/ GFR<45 on Jardiance. Side effects: hypotension, UTIs, increased urination, genital infections. Avoid Farxiga in pts. w/ bladder cancer. Lowers A1c 0.7% – 1.5%, lowers wt 1 – 3 lbs.
Dapagliflozin (Farxiga)	5 – 10 mg 1x daily	
Empagliflozin (Jardiance)	10 – 25 mg 1x daily	

▶ Efficacy:

- ▶ Weight loss of 1-3 lbs Reduce A1C ~0.7-1.5%



Decreases Glucose Reabsorption



Diabetes Education SERVICES

Considerations



- May temporarily lower GFR
- Monitor B/P, K+ & renal function.
- Side effects: hypotension, UTI, increased urination, genital yeast infections.
- Other benefits?
 - Reverses glucoses toxicity by increasing GLUT4 transport in muscle
 - Increase liver sensitivity to insulin and decreases gluconeogenesis.



Diabetes Education SERVICES

SGLT2 Inhibitors- How do they rate?

Question	Answer
▶ Cause hypoglycemia?	No
▶ Cause weight gain?	No
▶ Affordable?	No
▶ Lowers CV risk?	No
▶ Can most tolerate /use?	Yes?



Diabetes Education SERVICES

Indications for Insulin Sensitizers

Rosiglitazone (Avandia), Pioglitazone (Actos)

- ▶ **Action:** decrease insulin resistance by making muscle and adipose cells more sensitive to insulin. Decrease free fatty acids
- ▶ **Names:**
 - ▶ pioglitazone (Actos) – bladder cancer warning
 - ▶ Dosing: 15-45 mg daily
 - ▶ rosiglitazone (Avandia) – restriction relaxed
 - ▶ Dosing: 4-8 mg daily
- ▶ **Efficacy/ Considerations**
 - ▶ Reduce A1C ~0.5-1.0%
 - ▶ 6 weeks for maximum effect
 - ▶ \$100 a month
 - ▶ Can cause fluid retention, not indicated w/ CHF



Diabetes Education SERVICES

TZDs – How do they rate?

<u>Question</u>	<u>Answer</u>
▶ Cause hypoglycemia?	No
▶ Cause weight gain?	Yes
▶ Affordable?	Generic
▶ Lowers CV risk?	??
▶ Can most tolerate /use?	Watch CHF



Diabetes Education SERVICES

Indications for Glucosidase Inhibitors

Acarbose (Precose), Miglitol (Glyset)

Action: Slower

- ▶ Target post-prandial blood glucose
- ▶ Minimal systemic absorption



Diabetes Education SERVICES

Alpha-glucosidase Inhibitors

- ▶ **Action:** blocks enzymes that digest starches in the small intestine
- ▶ **Name:** acarbose (Precose)
 - ▶ Dosing: 75-300mg based on weight
- ▶ **Efficacy**
 - ▶ Decrease postprandial glucose 40-50 mg/dl
 - ▶ Decrease A1C 0.5-1.0%
- ▶ **Other Effects**
 - ▶ Flatulence or abdominal discomfort
 - ▶ Contraindicated in patients with inflammatory bowel disease or cirrhosis
- ▶ **Special Consideration**
 - ▶ In case of hypoglycemia, treat with glucose tabs or milk (other starches are blocked by medication))



Diabetes Education SERVICES

Acarbose– How does it rate?

Question	Answer
▶ Cause hypoglycemia?	No
▶ Cause weight gain?	No
▶ Affordable?	Yes
▶ Lowers CV risk?	Yes
▶ Can most tolerate /use?	No/Yes



Diabetes Education SERVICES

Amylin Mimetic Pramlintide (Symlin) 2005



- ▶ **Action:**
 - ▶ prevents post-meal rise in glucagon
 - ▶ slowing gastric emptying
 - ▶ Increases satiety
- ▶ **Efficacy:** Decreases A1c by 0.7%, wt by 3lbs
- ▶ **Dosing:**
 - ▶ Type 2 – max 120 mcg, BID before meals
 - ▶ Type 1 – max 60 mcg ac meals (meal = 30 gms carbs)
- ▶ **Other:** approved only as adjunct to insulin therapy – can't mix in same syringe with insulin



Diabetes Education SERVICES

Dopamine Agonists – Circadian Re-Setters

- ▶ **Action:** Increase am dopamine levels
- ▶ **Name:** bromocriptine mesylate QR (Cycloset)
 - ▶ **Dosing:** 1.6 to 4.8 mg per day
 - ▶ Each tab 0.8 mg, one tab a day, increase one tab a week
 - ▶ Give w/in 2 hrs of waking (before food)
- ▶ **Efficacy:**
 - ▶ Reduces A1C 0.6 – 0.9%
 - ▶ Reduces death from CV events
- ▶ **Side Effects:**
 - ▶ Nausea, vomiting, headaches, fatigue (watch for syncope)



Diabetes Education SERVICES

Critical Points

- ▶ Individualize Glycemic targets & BG-lowering
- ▶ Diet, exercise, & education: foundation T2DM therapy
- ▶ Metformin = optimal 1st-line drug.
- ▶ After metformin, data limited. Combo therapy reasonable
- ▶ Ultimately, many T2 patients will require insulin therapy
- ▶ All treatment decisions should be made in conjunction with the patient (focus on preferences, needs & values.)
- ▶ CV risk reduction - a major focus of therapy.

ADA-EASD Position Statement: Management of Hyperglycemia in T2DM

Diabetes Care 2012;35:1364-1379
Diabetologia 2012;55:1577-1596



Diabetes Education SERVICES

Self Study - List the Treatment Options

- ▶ 35 yr old, BMI 28, creat 0.8, A1c 6.7%
 - Sit 1: Wants to try lifestyle changes before meds
 - Sit 2: Started on Januvia, can't afford it. What alt med?
- ▶ 72 yr old, thin, lives alone, A1c 7.3%. History of MI, stroke. On glyburide 10mg a day and beta blocker. Creat 1.4.
- ▶ 69 year old male, BMI 25, on Metformin 1000mg BID. AM glucose 120s, A1c 8.1%. Creat 1.3
- ▶ 64 yr old on daily; amaryl 4mg, Januvia 100mg, Avandia® 4 mg. A1c 9.2%. Pt c/o of 12 lb wt gain over past month. Creat 1.2, LDL 138
- ▶ Pt on Exenatide 10mcg BID, c/o of sudden abd pain.



Diabetes Education SERVICES

PROFILES OF ANTIDIABETIC MEDICATIONS

	MET	DPP-4i	GLP-1 RA	TZD	AGI	COLSVL	BCR-QR	SU GLN	INSULIN	SGLT-2	PRAML
HYPO	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Moderate/ Severe Mild	Moderate to Severe	Neutral	Neutral
WEIGHT	Slight Loss	Neutral	Loss	Gain	Neutral	Neutral	Neutral	Gain	Gain	Loss	Loss
RENAL/ GU	Contra- indicated Stage 3B,4,5	Dose Adjustment May be Necessary (Except Linagliptin)	Exenatide Contra- indicated CrCl < 30	May Worsen Fluid Retention	Neutral	Neutral	Neutral	More Hypo Risk	More Hypo Risk & Fluid Retention	Infections	Neutral
GI Sx	Moderate	Neutral	Moderate	Neutral	Moderate	Mild	Moderate	Neutral	Neutral	Neutral	Moderate
CHF	Neutral	Neutral	Neutral	Moderate	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
CVD	Benefit	Neutral	Neutral	Neutral	Neutral	Neutral	Safe	?	Neutral	Neutral	Neutral
BONE	Neutral	Neutral	Neutral	Moderate Bone Loss	Neutral	Neutral	Neutral	Neutral	Neutral	? Bone Loss	Neutral

Few adverse events or possible benefits
 Use with caution
 Likelihood of adverse effects

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Thank You



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