Managing Complex Diabetes Cases: Medication Update

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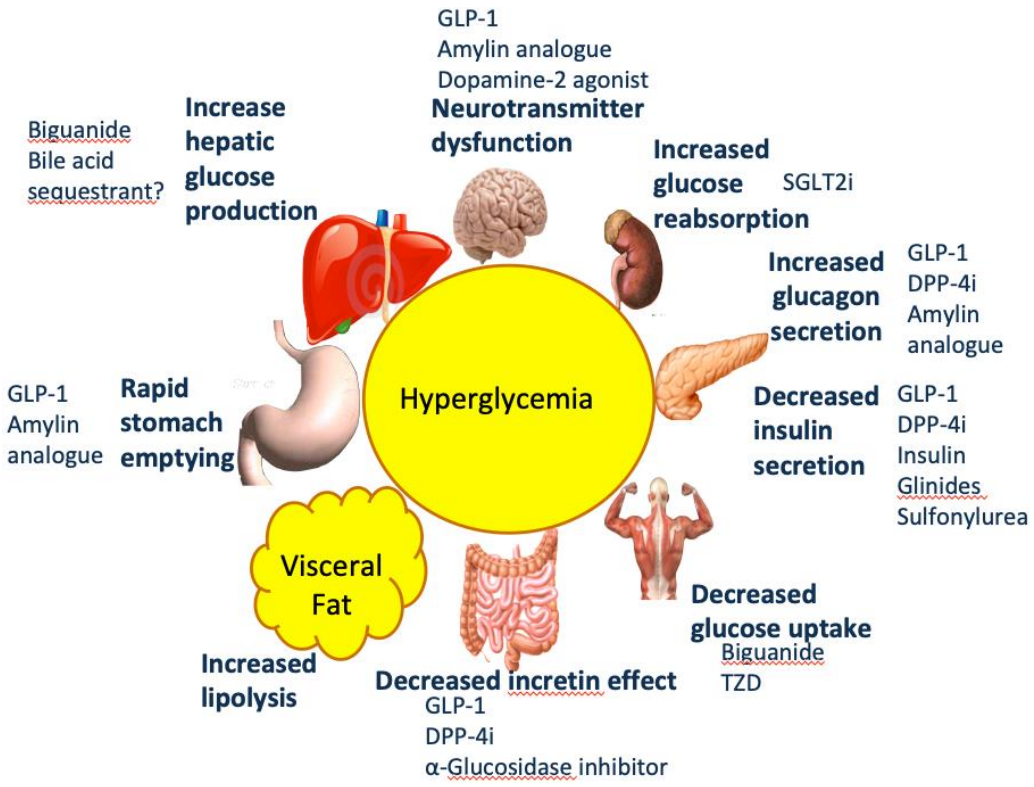
Objectives

- Describe how each diabetes medication class is used to treat diabetes
- Differentiate between the American Diabetes Association and American Association of Clinical Endocrinologists recommendations for medication management of people with diabetes
- Describe how to prescribe a custom diabetes medication plan based on te patient's needs and comorbidities

Diabetes Medication Classes

Medication Class	Year	Route	HbA1c % reduced
Alpha-glucosidase inhibitor	1995	PO	0.5-0.8
Amylin analog	2005	SC	0.6
Biguanide	1995	PO	1.5
Bile acid sequestrin	2008	PO	0.5 with metformin
Dopamine agonist	2009	PO	0.5-0.9
DPP-4 inhibitors	2006	PO	0.5-0.8
GLP-1 Receptor Antagonist	2005	SC	0.6
Insulin	1921	SC	> 2.5
Meglitinides	1997	PO	1-1.5
SGLT2 inhibitor	2013	PO	0.91-1.16
Sulfonylurea	1946	PO	1.5
Thiazolidinedione	1999	PO	0.8-1.0



Diabetes Medication Mechanism of Action [1,2]

Medication Class	Generic	Mechanism of Action
Alpha-glucosidase inhibitor	Acarbose Miglitol	Delays carbohydrate absorption from intestine
Amylin analog	Pramlintide	Decrease glucagon secretion, Slow gastric empty, Increase satiety
Biguanide	Metformin	Decrease hepatic glucose production, Increase glucose uptake muscle
Bile acid sequestrin	Colesevelam	Decrease hepatic glucose production? Increase incretin levels?
Dopamine agonist	Bromocriptine	Activates dopaminergic receptors
DPP-4 inhibitors	Alogliptin Linagliptin Saxagliptin Sitagliptin	Increase glucose-dependent insulin secretion, Decrease glucagon secretion
GLP-1 Receptor Antagonist	Dulaglutide Exenatide Exenatide ER Liraglutide Lixisenatide Semaglutide	Increase glucose-dependent insulin secretion, Decrease glucagon secretion, slow gastric emptying, Increase satiety
Insulin	Aspart Degludec Detemir Glargine Glulisine Lispro NPH NPL Regular	Causes uptake of glucose into cells
Meglitinides	Nateglinide Repaglinide	Increases Insulin secretion
SGLT2 inhibitor	Canagliflozin Dapagliflozin Empagliflozin Ertugliflozin	Increases urinary excretion of glucose
Sulfonylurea	Glimepiride Glipizide Glyburide	Increases insulin secretion
Thiazolidinedione	Pioglitazone Rosiglitazone	Increases glucose uptake in muscle and fat, Decrease hepatic glucose

Diabetes Medications Comparison

	Met	GLP1RA	SGLT2i	DPP4i	AGI	TZD	SU/GLN	Colsvl	BCR	Insulin	Praml
Efficacy	High	High	Medium	Medium	Medium	High	High	Mild	Mild	Highest	Medium
Hypo	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Yes	Neutral	Neutral	Yes	Neutral
Weight	Sl loss	Loss	Loss	Neutral	Neutral	Gain	Gain	Neutral	Neutral	Gain	Loss
Renal progrss	Contra eGFR <30	No Exen CrCl<30 ?benefit Liraglut	Possible benefit Renal dosing Genital mycotic infection	Renal dosing all but lina Reduces urine albumin	Neutral	Neutral	Increase risk hypogly	Neutral	Neutral	Increase risk hypogly	Neutral
Renal dosing	Contra eGFR <30	Yes exen, lixi	Yes, all	Yes sita, alo, saxa	No adj	No adj	May need to dec	No adj	No adj	May need to dec	No
GI	Mod	Mod	Neutral	Neutral	Mod	Neutral	Neutral	Mild	Mod	Neutral	Mod
ASCVD	Poss benefit	Benefit lira, sema, exen, exen ER	Benefit Empa, Cana	Neutral	Neutral	Poss benefit pio	Poss risk	Benefit	Safe	Neutral	Neutral
CHF	Neutral	Neutral	Benefit Empa, Cana	Poss increase hosp alo, saxa	Neutral	Mod	Neutral	Neutral	Neutral	Increase Risk	Neutral
Bone	Neutral	Neutral	Mild fx risk	Neutral	Neutral	Mod fx risk	Neutral	Neutral	Neutral	Neutral	Neutral
DKA	Neutral	Neutral	Can occur	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Cost	Low	High	High	High	Medium	Low	Low	High	High	High	High

Selecting a medication regimen if ASCVD predominates

- GLP1RA with proven CVD benefit or SGLT2i with proven CVD benefit
- If don't tolerate, switch to the other
- If tolerates but not to target, add the other
- Can also add DPP4i if not on GLP1RA, or add Basal insulin, TZD, or Sulfonylurea

Selecting a medication regimen if HF or CKD predominates

- If HF or CKD predominates, add SGLT2i with evidence of reducing HF and/or CKD if eGFR adequate
- If not tolerate or eGFR not adequate, add GLP1RA with proven CVD benefits
- If not at goal consider adding other class with proven CVD benefit, can add DPP4i if not on GLP1RA, Basal insulin or sulfonylurea
- If HF, avoid TZD, saxagliptin

Selecting a medication regimen if need to minimize hypoglycemia

DPP4i	GLP-1RA	SGLT2i	TZD
A1c not at goal ↓	A1c not at goal ↓	A1c not at goal ↓	A1c not at goal ↓
Add SGLT2i or TZD	Add SGLT2i or TZD	Add GLP1RA or DPP4i or TZD	SGLT2i or DPP4i or GLP1RA
A1c not at goal ↓	A1c not at goal ↓	A1c not at goal ↓	A1c not at goal ↓
Continuing adding agents as outlined above			
A1c not at goal ↓			
Consider adding sulfonylurea later generation with lower risk hypoglycemia or basal insulin with lower risk for hypoglycemia			

Selecting a medication regimen if need to minimize weight gain

GLP1RA with efficacy for wt loss	SGLT2i
A1c not at goal ↓	A1c not at goal ↓
Add SGLT2i	Add GLP1RA w efficacy for wt loss
A1c not at goal ↓	
If triple therapy required or either GLP1RA or SGLT2i not tolerated or contraindicated, use regimen with lowest risk of weight gain: DPP4i if not on GLP1RA	
If DPP4i not tolerated or contraindicated or patient already on GLP1RA, cautiously add sulfonylurea, TZD, or basal insulin	

Selecting a medication regimen if need to minimize cost

Sulfonylurea	TZD
A1c not at goal ↓	A1c not at goal ↓
TZD	Sulfonylurea
A1c not at goal ↓	
Lowest cost basal insulin or DPP4i or SGLT2i with lowest cost	

Starting insulin T1DM[3]

- Most should be treated with intensive insulin tx with prandial, correctional and basal insulin
- Begin with a weight based dose: 0.4-1.0 units kg/day with 0.5 units/kg as a typical starting total daily dose
    - 50% basal
    - 50% bolus
- Higher amounts often needed during puberty, pregnancy and illness
- **Honeymoon**: several weeks after initiating insulin therapy, some recovery of β-cell function causes decreased need for insulin for weeks to months
- Use of analog rapid-acting insulin reduced hypoglycemia risk
- Match prandial insulin to carbohydrate intake
- Give prandial insulin 15 minutes before eating except FiAsp and inhaled insulin

Insulin to Carbohydrate Ratio

- 450 ÷ total daily dose = starting carb ratio
- If the BG high after eating
    - Make sure insulin is given 15 minutes prior to eating, then
    - Lower the carb ratio to get a larger insulin dose
- If the BG is low after eating
    - Raise the carb ratio to get a smaller insulin dose
- May need different ratios for different times of the day

Correction/Sensitivity Factor

- 1700 ÷ total daily dose = starting correction/sensitivity factor
- After 3-4 hours: if the BG does not reach target +/- 30 mg/dL
    - BG too high: decrease factor to get a larger insulin dose
    - BG too low: increase factor to get a smaller insulin dose
    - May need different correction/sensitivity factors during the day/night

Rapid Acting Insulin: best given 15 minutes prior to eating [4]

Onset: 15 minutes
Peak: 30-90 minutes
Duration: 3-5 hours

- Lispro/Humalog U-100 and U-200
- Glulisine/Apidra
- Aspart/Novolog
- Aspart/Fiasp: onset 2.5 minutes

Short Acting Insulin: Regular

- Onset: 60 min
- Peak: 2-4 hours
- Duration: 6-8 hours

Intermediate Acting Insulin: NPH

- Onset: 1-3 hours
- Peak: 6-12 hours
- Duration: 12-24 hours

Basal Insulin

Name	Onset	Peak	Duration
Detemir / Levemir	0.8-2 hrs	3.2-9.3	Up to 24 hrs
Glargine / Lantus	1-2 hrs	Peakless	Up to 24 hrs
Glargine U-300 / Toujeo	30-90 min	Peakless	Over 24 hrs
Glargine / Basiglar	1-2 hours	Peakless	Up to 24 hours
Degludec / Tresiba	30-90 min	Peakless	Over 24 hours
Degludec U-200 / Tresiba U-200	30-90 min	Peakless	Over 24 hours

Humulin R U-500

- For pts > 200 units of insulin per day
- Contains 500 units per milliliter
- Comes in a 20 ml vial = 10,000 units
    - New U-500 insulin syringe
    - TB syringe – measure in ml
    - U-100 insulin syringe – must convert
- Comes in a 3 ml pen = 1500 units
    - 5 unit increments

Inhaled Human Insulin

- 4 unit and 8 unit cartridges
- Peaks 53 minutes, Duration 160 minutes
- Prandial insulin
- Contraindicated: hypoglycemia, chronic lung disease, hypersensitivity to human insulin
- Prior to prescribing: perform PMH, PE, and spirometry FEV1, Causes a small decline in lung function

Lower Cost Insulins

- Relion R (Walmart)
- Relion N (Walmart)
- Relion 70/30 (Walmart)
- Basiglar (glargine)
- Admelog (lispro)

Starting basal insulin T2DM

- Basal: 10 unit/day or 0.1-0.2 units/kg
- Titrate: increase 2 units every 3 days until FBG target reached without hypoglycemia
- If hypoglycemia: determine cause and decrease 10-20% if no clear cause

Adding prandial insulin T2DM

- 4 units day or 10% of basal dose
    - 1 dose per day: with largest meal or Posprandial BG
    - Can add additional prandial insulin if needed
- Increase dose by 1-2 units or 10-15% twice weekly
- If hypoglycemia, determine cause and if no clear cause, decrease dose causing hypoglycemia by 10-20%

Premixed Insulin

- Insulin naïve: 10-12 units/day or 0.3 units/kg
- If on existing insulin: use same total daily dose and adjust as needed
- Usually give 2-3 doses per day
    - 2 per day: usual 2/3 breakfast, 1/3 supper but if large supper may need 50% Breakfast and 50% Supper
    - 3 per day with meals: 1/3 dose per meal and titrate

Combination GLP1RA with basal insulin

- Glargine 100 units/mL + Lixisenatide 33 mcg/mL
  - If on less than 30 units/day: start 15 units daily
  - If on 30-60 units/day: start 30 units/day
  - Maximum dose is 60 units glargine and 20 mcg lisixenatide
- Degludec 100 units/mL + Liraglutide 3.6 mg/mL
  - Starting dose: 16 units degludec and 0.58 mg liraglutide
  - Maximum dose is 50 units degludec and 1.8 mg Liraglutide

Diabetes Medications on the United States Market

ALPHA-GLUCOSIDASE INHIBITOR

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Acarbose	Precose	25, 50 100 mg tab	50-100 mg tid PO	< 60 kg: 150/d > 60 kg 300/d
Miglitol	Glyset	25, 50 100 mg tab	50 mg tid PO	300/d

AMINO ACID DERIVATIVE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Nateglinide	Starlix	60,120 mg tab	120 mg tid PO	360/d

AMYLIN ANALOGUE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Pramlintide	Symlin	0.1/mL injectable Sold in boxes of 2 pens with 2.7 mL per pen total 5.4 mL per box	T1DM start 15 mcg with meals ≥ 30 gm CHO and titrate up by 15 mcg as tolerated T2DM 60 mcg with meals ≥ 30 gms CHO	120 mcg with meals containing ≥ 30 gms CHO

BIGUANIDE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Metformin	Fortamet	500, 1000 mg ER	500-2500 mg qd PO	2,500/d
	Glucophage	500, 850, 1000 mg	500-2,500 mg qd in 2-3 div dose	2,550/d
	Glucophage XR	500, 750 mg ER	500-2000 single or div dose PO	2000/d
	Glumetza	500,1000 mg ER	500-2,000 once daily PO	2000/d
	Riomet	500 mg/5 mL Oral sol	500-2,500 single or div dose PO	2,550/d

BILE ACID SEQUESTRANT

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Welchol	Colesevelam	625 mg tab	6 tabs qd, or 3 tabs bid	4.5 g/d
Welchol oral sus	Colesevelam	3.75 g pwd pkts	1 pwd pkt / d	4.5 g/d

DIPEPTIDYL PEPTIDASE-4 INHIBITOR

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Alogliptin	Nesina	6.25, 12.5, 25 mg tab	6.25, or 12.5, or 25 mg qd	Depends of CrCl
Linagliptin	Tradjenta	5 mg tab	5 mg qd	5 mg qd
Saxagliptin	Onglyza	2.5, 5 mg tab	Depends on Cr Cl	Depends on CrCl
Sitagliptin	Januvia	25, 50, 100 mg tab	Depends on Cr Cl	Depends on CrCl

DIPEPTIDYL PEPTIDASE-4 INHIBITOR + BIGUANIDE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Alogliptin/metformin	Kazano	12.5/500, 12.5/1000 mg tab	Depends on Cr Cl	12.5/1000 bid
Linagliptin/metformin	Jentadueto	2.5/500, 2.5/850, 2.5/1000 mg tab	Depends on Cr Cl	2.5/1000 bid
Saxagliptin/metformin ER	Kombiglyze XR	5/500, 5/1000, 2.5/1000 mg tab	Depends on Cr Cl	5/2000 mg qd
Sitagliptin/metformin	Janumet	50/500, 50/1000 mg tab	Depends on Cr Cl	100/2000 mg qd
Sitagliptin/metformin XR	Janumet XR	100/500, 50/1000, 100/1000 mg tab	Depends on Cr Cl	100/2000 mg qd

DOPAMINE RECEPTOR AGONIST

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Bromocriptine	Cycloset	0.8 mg tab	1.6-4.8 mg qd	4.8 mg qd

GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONIST

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Albiglutide	Tanzeum	30, 50 mg inj Single dose pens	30-50 mg q wk	50 mg q wk
Dulaglutide	Trulicity	0.75/0.5 mL , 1.5/0.5 mL mg inj Single dose pens	0.75-1.5 mg q wk	1.5 mg q wk
Exenatide	Byetta	250 mcg/mL inj Sold in 5 and 10 mcg pens 60 doses per pen	5 mcg bid	10 mcg bid
Exenatide ER	Bydureon	2 mg inj Single dose pens	2 mg q wk	2 mg q wk
Liraglutide	Victoza	6 mg/mL inj Pen = 3 mL sold in boxes of 2 or 3 pens (6 or 9 mL)	0.6-1.8 mcg qd	1.8 mcg qd
Lixisenatide	Adlyxin	20 mcg Pen, 10 mcg Pen	10 mcg for 2 weeks	20 mcg start on day 15
Semaglutide	Ozempic	2 mg/1.5 mL pen	0.25 qwk x 4 wk then 0.5 mg qwk x 4 wk	Can increase to max 1 mg qwk if needed

GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONIST + INSULIN

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Soliqua 100/33	Glargine + lixisenatide	Pen = 3 mL sold in boxes of 5 pens = 15 mL per box	Start dose = 15 u/5 mcg. Titrate 2-4 units weekly	Max dose 60 units/20 mcg
Xultophy 100/3.6	Degludec + liraglutide	Pen = 3 mL sold in boxes of 5 pens = 15 mL per box	Start dose = 16 units/0.58 mg. Titrate 2 units every 3-4 days	Max dose = 50 units/1.8 mg

MEGLITINIDE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Repaglinide	Prandin	0.5 1, 2 mg tab	0.5-4 mg bid-qid titrate up/down by 2 units	16 mg qd

MEGLITINIDE + BIGUANIDE

Generic Name	Brand Name	Dose Form Available	Maximum
Repaglinide/metformin	PrandiMed	1/500, 2/500 mg tab	10/2500 mg qd

SODIUM-GLUCOSE CO-TRANSPORTER 2 INHIBITOR

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Canagliflozin	Invokana	150, 300 mg tab	150 mg	300 mg qd
Dapagliflozin	Farxiga	5, 10 mg tab	5 mg	10 mg qd
Empagliflozin	Jardiance	10, 25 mg tab	10 mg	25 mg qd
Ertugliflozin	Steglatro	5, 15 mg tab	5 mg	15 mg qd

SODIUM-GLUCOSE CO-TRANSPORTER 2 INHIBITOR + Biguanide

Generic Name	Brand Name	Dose Form Available	Maximum
Canagliflozin/metformin	Invokamet	50/500, 50/1000, 150/500. 150/1000 mg tab	300/2000 mg qd
Dapagliflozin/metformin	Xigduo XR	5/500, 5/1000, 10/500, 10/1000 mg tab	10/2000 mg qd
Empagliflozin/metformin	Synjardy	5/500, 5/1000 mg, 12.5/1000, 25/1000 tab	25/2500 mg qd
Ertugliflozin/metformin	Segluromet	2.5/500, 2.5/1000, 7.5/500, 7.5/1000	10/2000 mg qd

SODIUM-GLUCOSE CO-TRANSPORTER 2 INHIBITOR + DIPEPTIDYL PEPTIDASE-4 INHIBITOR

Generic Name	Brand Name	Dose Form Available	Maximum
Empagliflozin/linagliptin	Glyxambi	10/5, 25/5 mg tab	25/5 mg qd
Dapigliflozin/saxigliptin	Qtern	10/5	10/5
Ertugliflozin/sitagliptin	Steglujan	5/100, 15/100	15/100

SULFONYLUREA

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Glimepiride	Amaryl	1, 2, 4 mg tab	1-4 mg qd	8 mg qd
Glipizide	Glucotrol	5, 10 mg tab	5-15 mg qd	40 mg qd divided doses
Glipizide XL	Glucotrol XL	2.5, 5. 10 mg tab	5-10 mg qd	20 mg qd
Glyburide	Diabeta	1.25, 2.5, 5 mg scored tab	1.25-20 mg qd	20 mg qd sing/div doses
Glyburide micronized	Glynase PresTab	1.5, 3, 6 mg scored tab	0.75-12 mg qd	12 mg qd divided doses

SULFONYLUREA + BIGUANIDE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Glipizide/metformin		2.5/250, 2.5/500, 5/500 mg tab		20/2000 mg qd sing/div doses
Glyburide/metformin	Glucovance	1.25/250, 2.5/500, 5/500 mg tab		20/2000 mg qd sing/div doses

THIAZOLIDINEDIONE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Pioglitazone	Actos	15, 30, 45 mg tab	15-45 mg qd	45 mg qd
Rosiglitazone	Avandia	2, 4, 8 mg tab	4-8 mg qd or div doses	8 mg qd

THIAZOLIDINEDIONE + BIGUANIDE

Generic Name	Brand Name	Dose Form Available	Starting	Maximum
Pioglitazone/ metformin	ACTOplusmet	15/500, 15/850 mg tab	15/500 or 15/850 qd or bid	45/2550 mg qd

THIAZOLIDINEDIONE + SULFONYLUREA

Generic Name	Brand Name	Dose Form Available	Maximum
Pioglitazone/glimepiride	Duetact	30/2, 30/4 mg tab	30/4 mg qd
Rosiglitazone/glimepiride	Avandaryl	4/1, 4/2, 4/4, 8/2, 8/4 mg tab	8/4 mg qd

INSULIN

RAPID ACTING

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
Aspart	Fiasp	Yes 1000 units/10mL	Fiasp Flextouch 1u increment Max 80 3mL/300 units/pen 5 pens/box = 1500	No	28 days
Aspart	Novolog	Yes 1000 units/10mL	Novolog FlexPen 1 u increment Max 60 3mL/300 units/pen 5 pens/box = 1500	Penfill for NovoPen Echo 0.5 u increments max 30 3mL/300 units/pen 5 pens/box = 1500	28 days
Glulisine	Apidra	Yes 1000 units/10mL	Apidra Solostar 1 u increment Max 80 3mL/300 units/pen 5 pens/box = 1500	No	28 days
Lispro	Humalog	Yes 1000 units/10mL	Humalog KwikPen 1 u increment Max 60 3mL/300 units/pen 5 pens/box = 1500	Cartridge for Autopen Classic Model AN3810 1 u increment max 21 Classic Model AN 3800 2 u increment max 42 HumaPen Luxura HD 0.5 u increment max 30 3mL/300 units/pen 5 pens/box = 1500	28 days
Lispro U-200	Humalog U-200	No	Humalog KwikPen U-200 1 u increment Max 60 3 mL/600 units/pen 2 pens/box = 1200	No	28 days

Inhaled Rapid Acting Human Insulin

Injected Mealtime insulin Dose	**Afrezza Dose**	**# of 4 unit blue cartridges**	**# of 8 unit green cartridges**
Up to 4 units	4 units	1	0
5-8 units	8 units	0	1
9-12 units	12 units	1	1
13-16 units	16 units	0	2
17-20 units	20 units	1	2
21-24 units	24 units	0	3

Afrezza sold in the following forms:

- 60 – 4 unit cartridges with 2 inhalers: NDC 47918-004-02
- 90 - 4 unit cartridges with 2 inhalers: NDC 47918-004-03
- 90 - 8 unit cartridges with 2 inhalers: NDC 47918-008-03
- 90 – with 60 as 4 unit cartridges and 30 as 8 unit cartridges: NDC 47918-048-12
- 90 – with 30 at 4 unit cartridges and 60 as 8 unit cartridges: NDC 47918-048-21
- 180 – with 90 as 4 unit cartridges and 90 as 8 unit cartridges: NDC 47918-048-33

SHORT ACTING

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
Regular U-100	Humulin R U-100 Novolin R Relion R	Yes 1000 units/10mL	No	No	31 days

CONCENTRATED REGULAR INSULIN

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
Regular U-500	Humulin R U-500	Yes 10,000 units/20 mL	Humulin R U-500 Kwikpen 5 u increment Max 300 3 mL pen = 1500 units/pen 2 pens/box = 3000 5 pens/box = 7500	No	40 days

INTERMEDIATE ACTING

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
NPH	Yes 1000 units/10mL	Yes 1000 units/10mL	Humulin N KwikPen 1 u increment max 60 3mL/300 units/pen 5 pens/box = 1500	No	Vial 31 days Pen 14 days
NPL	Found as part of premixed insulin see combination list				

LONG ACTING

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
Basiglar	Basiglar	No	Basiglar KwikPen 1 u increment Max 80 3mL/300 units/pen 5 pens/box = 1500	No	28 days
Degludec	Tresiba U-100	No	Tresiba FlexTouch 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	8 weeks
Degludec U-200	Tresiba U-200	No	Tresiba FlexTouch U-200 2 u increments Max 160 3mL/600 units/pen 3 pens/box = 1800	No	8 weeks

Detemir	Levemir	Yes 1000 units/10mL	Levemir FlexTouch 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	42 days
Glargine	Lantus	Yes 1000 units/10mL	Lantus Solostar 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	28 days
Glargine U-300	Toujeo	No	Toujeo Solostar 1 u increments Max 80 1.5 mL/450 units/pen 3 pens/box = 1500	No	28 days

COMBINATION

Generic Name	Brand Name	Vial	Pen	Penfill/cartridge	Dispose after
50% NPL, 50% Lispro	Humalog Mix 50/50	Yes 1000 units/10mL	Humalog KwikPen 50/50 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	Vial 28 days Pen 10 days
75% NPL, 25% Lispro	Humalog Mix 75/25	Yes 1000 units/10mL	Humalog KwikPen 75/25 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	Vial 28 days Pen 10 days
50% NPH, 50% Regular	Humulin 50/50	Yes 1000 units/10mL	No	No	31 days
70% NPH, 30% Regular	Humulin 70/30 Novolin 70/30 Relion 70/30	Yes 1000 units/10mL	Humulin 70/30 Kwikpen 1 u increments Max 60 3mL/300 units/pen 5 pens/box = 1500	No	Vial 31 days Pen 10 days
70% NPL, 30% Regular	Novolog Mix 70/30	Yes 1000 units/10mL	Novolog Mix 70/30 FlexTouch 1 u increments Max 60 3mL/300 units/pen 5 pens/box = 1500	No	Vial 28 days Pen 28 days
70% degludec; 30% aspart	Ryzodeg 70/30	No	Ryzodeg 70/30 FlexTouch 1 u increments Max 80 3mL/300 units/pen 5 pens/box = 1500	No	28 days

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