

Broadening Indications For Diabetes Drugs

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Diabetes Timeline

Sulfonylureas

1990

Sulfonylureas

Chlorpropamide - 1958

Acetohexamide - 1960

Tolbutamide - 1982

Tolazamide - 1983

Glyburide - 1984

Glipizide - 1984

Glimepiride - 1995

Diabetes Timeline

Sulfonylureas

Metformin

1990

1993

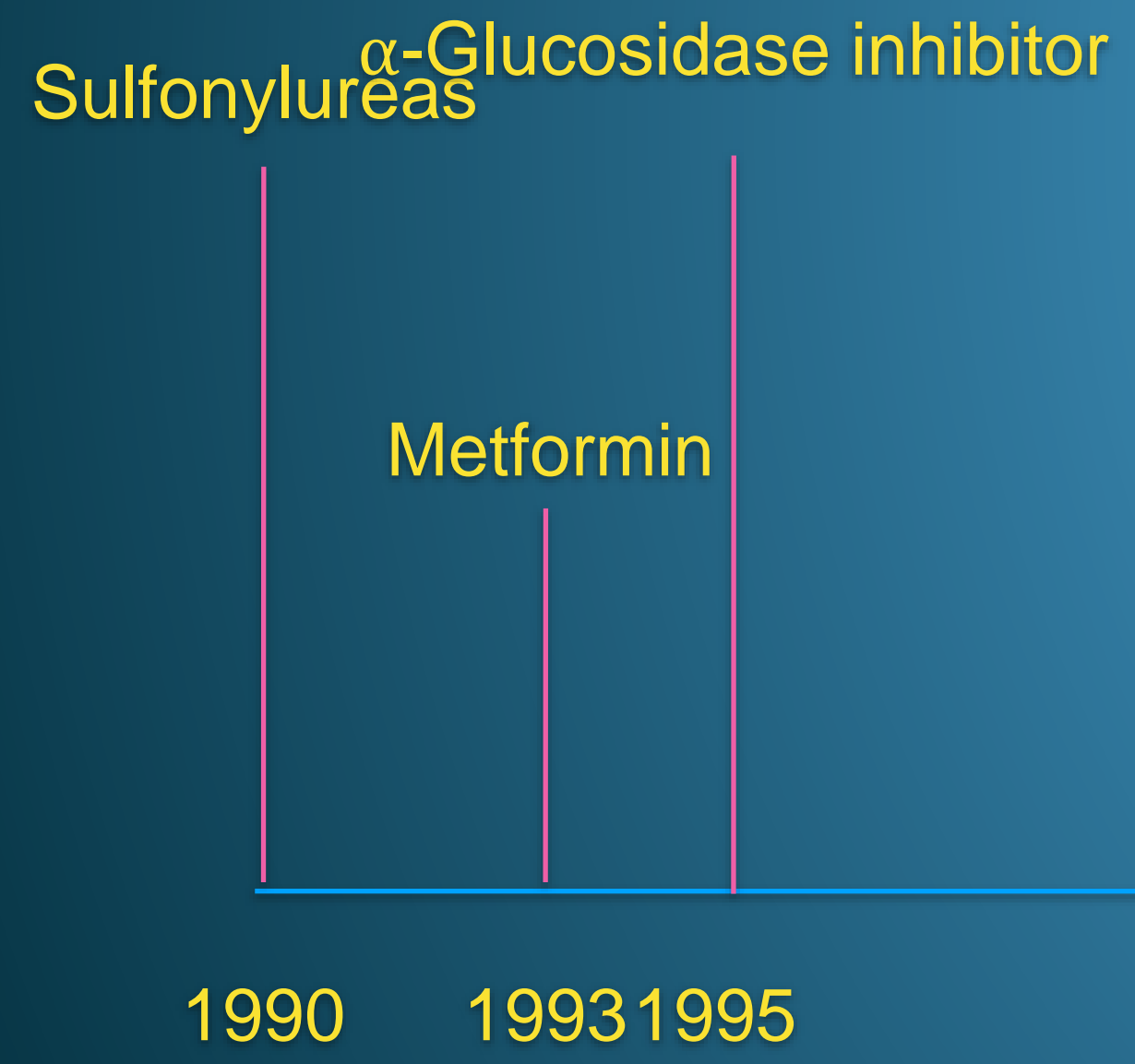


Biguanides
Metformin

Weight neutral

Reduces LDL and triglycerides

Diabetes Timeline



α -Glucosidase Inhibitors

Acarbose - 1995

Diabetes Timeline



Meglitinides

Repaglinide - 1997

Nateglinide - 2000

Thiazolidinediones

Troglitazone - 1997, 1999 (3x transaminases)

Rosiglitazone - 1999, 2007 (CHF?)

Pioglitazone - 1999, 2011 (ACT NOW), 2018 (NASH/NAFLD)

Diabetes Timeline



Bile Acid Sequestrant

Colesevelam - 2000, 2008

Diabetes Timeline



GLP-1 Agonists

Exenatide - 2005, 2014

Exenatide

Glucose-mediated insulin secretion

Restores 1st-phase insulin secretion

Glucose-mediated glucagon suppression

Slows gastric motility

Reduces appetite

Stimulates beta cell proliferation

GLP-1 Agonists

Exenatide - 2005, 2014

Liraglutide - 2010, 2014 (LEADER)

Liraglutide

Indication

- Adjunct to diet and exercise to improve glycemic control in patients 10 years or older with type 2 diabetes mellitus
- For adults with excess weight (BMI ≥ 30 or 27 with a weight-related comorbidity), and children aged 12-17 years with body weight > 60 kg to help lose weight and keep it off

GLP-1 Agonists

Exenatide - 2005, 2014

Liraglutide - 2010, 2014 (LEADER)

Dulaglutide - 2014, 2020 (REWIND, AWARD-11)

Dulaglutide

Indications

- Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus
- To reduce the risk of MACE in adults with type 2 diabetes mellitus who have established CV disease or multiple CV risk factors
- Primary prevention of MACE in adults with type 2 diabetes mellitus who have established CV disease or multiple CV risk factors

Not recommended as first-line therapy for patients not controlled by diet and exercise

GLP-1 Agonists

Exenatide - 2005, 2014

Liraglutide - 2010, 2014 (LEADER)

Dulaglutide - 2014, 2020 (REWIND, AWARD-11)

Albiglutide - 2014

GLP-1 Agonists

Exenatide - 2005, 2014

Liraglutide - 2010, 2014 (LEADER)

Dulaglutide - 2014, 2020 (REWIND, AWARD-11)

Albiglutide - 2014

Lixisenatide - 2016

GLP-1 Agonists

Exenatide - 2005, 2014

Liraglutide - 2010, 2014 (LEADER)

Dulaglutide - 2014, 2020 (REWIND, AWARD-11)

Albiglutide - 2014

Lixisenatide - 2016

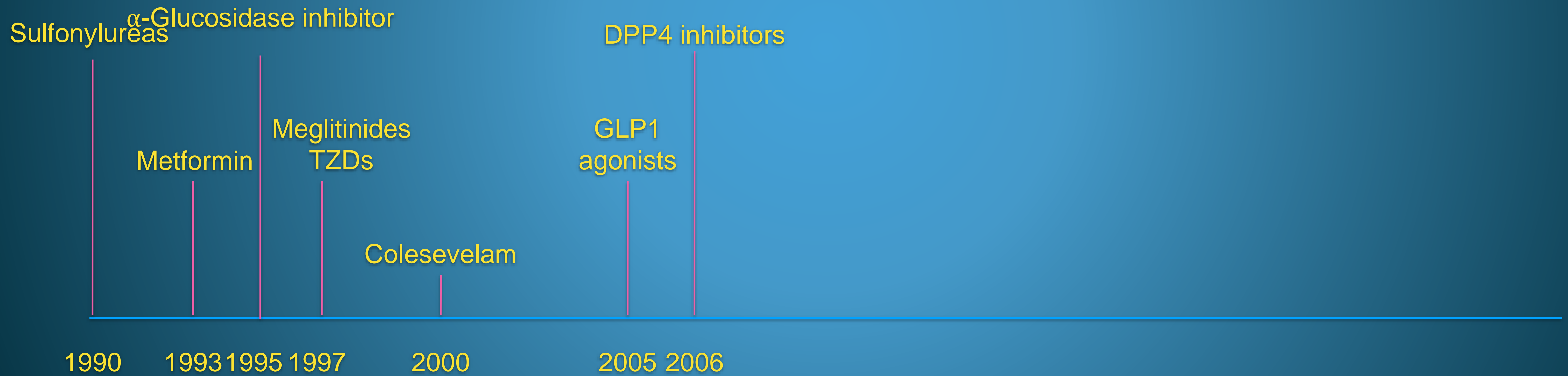
Semaglutide - 2017, 2020 (SUSTAIN-6), 2021 (STEP 1)

Semaglutide

Indications

- As an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus
- To reduce the risk of MACE in adults with type 2 diabetes mellitus and established cardiovascular disease
- For weight loss in adults with BMI ≥ 30 alone or ≥ 27 with at least 1 weight-related comorbidity (HTN, high cholesterol)

Diabetes Timeline



DPP4 Inhibitors

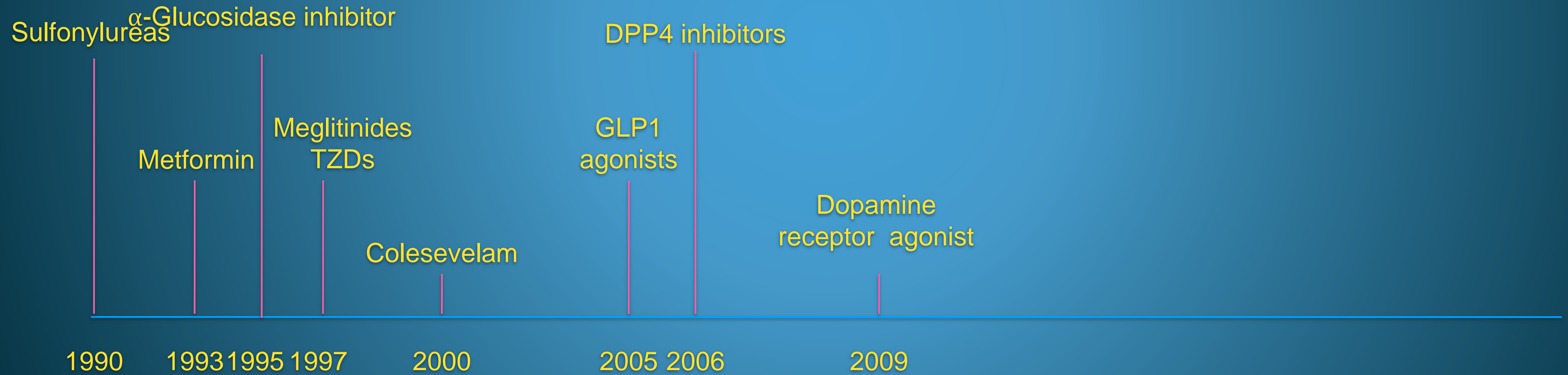
Sitagliptin - 2006

Saxagliptin - 2009

Linagliptin - 2011

Alogliptin - 2013

Diabetes Timeline

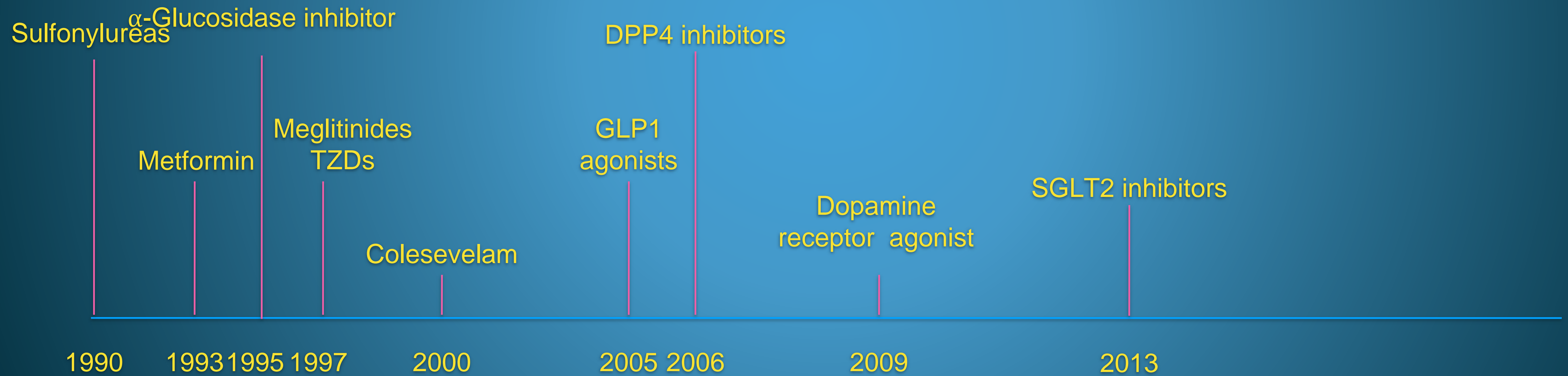


Dopamine Receptor Agonist

Bromocriptine - 1978

Bromocriptine QR - 2009

Diabetes Timeline



SGLT-2 Inhibitors

Canagliflozin - 2013, 2017 (CANVAS), 2019 (CREDENCE)

Dapagliflozin - 2014, 2021 (DECLARE, DAPA-HF)

Empagliflozin - 2014, 2021 (EMPA-REG)

Ertugliflozin - 2017

Canagliflozin

Indications

- Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus
- To reduce the risk of MACE in adults with type 2 diabetes mellitus and established CV disease
- To reduce the risk of end-stage kidney disease, doubling of serum creatinine, CV death, and hospitalization for heart failure in adults with type 2 diabetes mellitus and diabetic nephropathy with albuminuria

Dapagliflozin

Indications

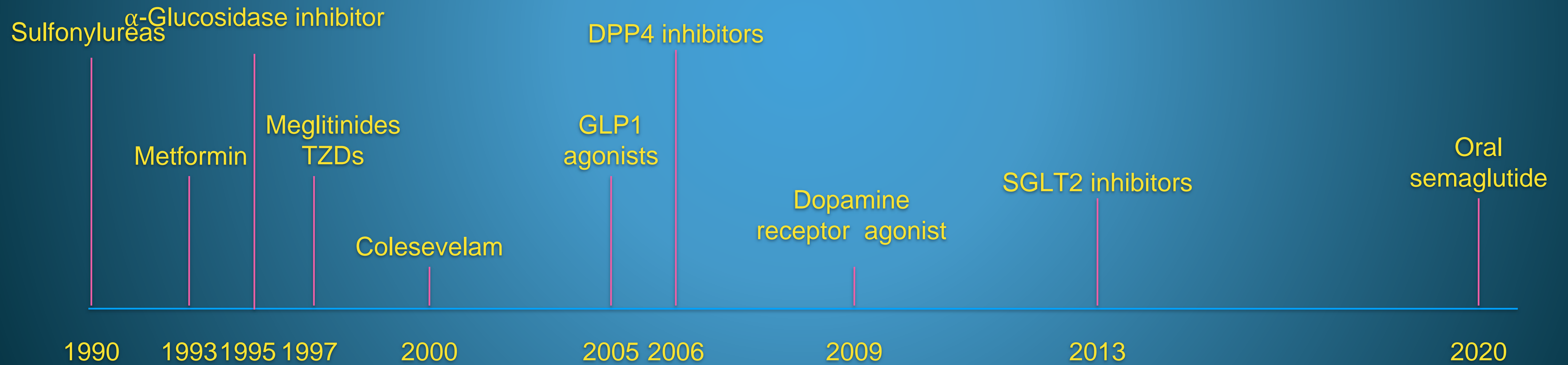
- Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus
- To reduce the risk of hospitalization for heart failure in adults with type 2 diabetes mellitus and established cardiovascular disease or multiple cardiovascular risk factors (45% RRR in DECLARE-TIMI 58 trial)
- To reduce the risk of cardiovascular death and hospitalization for heart failure in adults with NYHA Class II-IV heart failure with reduced EF (26% RRR in DAPA-HF trial with NNT=21)

Empagliflozin

Indications

- Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus
- To reduce the risk of CV death in adults with type 2 diabetes mellitus and established CV disease (EMPA-REG)

Diabetes Timeline



New Delivery Systems for Existing Drugs

Glucagon
Insulin

Glucagon nasal powder

Indication

- Hypoglycemic emergencies (unable to eat, having seizure, or unconscious) in adult and pediatric patients with diabetes ages 4 years and above

Dosing

- 3 mg intranasal (does not need to be inhaled)
- May be repeated if no response after 15 minutes

Hybrid Closed Loop Insulin Pump

Medtronic/Minimed 670 G

- Auto Mode automatically adjusts basal insulin delivery every 5 minutes based upon CGM to keep glucose within target range
- Manual Mode with Suspend before low option proactively addresses hypoglycemia and rebound hyperglycemia by automatically suspending insulin delivery before reaching a pre-selected low glucose limit and resuming delivery when sensor glucose levels recover.

Advanced Hybrid Closed Loop Insulin Pump

Tandem T-Slim X2 Pump + Dexcom G6 CGM

- Basal-IQ predicts glucose levels 30 minutes ahead and helps prevent frequency and duration of hypoglycemic events by turning insulin on and off as often as every 5 minutes
- Control-IQ adjusts basal insulin delivery every 5 minutes + delivers correction bolus once per hour to prevent high and low blood glucose levels

InPen

Calculates personalized doses

Tracks active insulin and logs doses

Reminds to dose and check BG

Synchs with CGMs and glucose meters

Bluetooth-compatible with iPhone and Android

Creates shareable reports x email, print, share, fax

12-month battery life and warranty

Up to 30 units/dose

WHAT'S NEXT