

HEALTHY ARIZONA WORKSITES PROGRAM (HAWP) PRESENTS:

JOURNEY FROM PREDIABETES TO DIABETES-PREVENTION AND TREATMENT



Presented by:

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WEBINAR HOUSEKEEPING

WELCOME

All lines have been muted.

Please type any questions into the chat or Questions panel and we will do our best to answer them all at the end.

All handouts and a copy of the presentation slides are available in the Handouts panel.

Please complete the survey that will be emailed out after the presentation

A recording will be added to the library of HAWP webinars on our website within 48 hours.

Special thanks to our supporting partner the Dignity Health for their generous support in making this webinar possible.

Participants will learn about

- ☐ Prevalence of diabetes
- ☐ Types of Diabetes
- ☐ Screening and prevention opportunities
- New paradigms: Lifestyle and behavioral change, Pharmacotherapy, diabetes technology and surgical treatment options
- ☐ Tips for educating your staff about risk factors, diagnosis and treatment



Fast Facts on Diabetes

Diabetes

Total: 37.3 million people have diabetes (11.3% of the US population)

Diagnosed: 28.7 million people, including 28.5 million adults

Undiagnosed: 8.5 million people (23.0% of adults are undiagnosed)

Prediabetes

One in three U.S. adults has prediabetes—96 million people!

More than 8 in 10 don't even know they have it



CLASSIFICATION

- Type 1 diabetes
- Type 2 diabetes
- Gestational diabetes mellitus (GDM)
- Specific types of Diabetes due to other cause:
 - Diseases of the Exocrine pancreas
 - Monogenic diabetes
 - Drug- or chemical-induced



Prediabetes

FPG 100-125 mg/dL

OR

2-h plasma glucose 140–199 mg/dL: IGT

OR

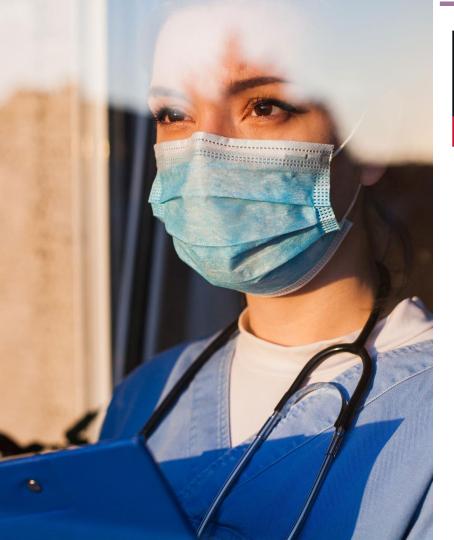
A1C 5.7-6.4%



Prediabetes/Diabetes Screening

- Screening at age 35 for all
- Any adult who is overweight or obesity and/or who has one or more additional risk factor for diabetes
- ☐ If tests are normal, repeat at a minimum of 3-year intervals.





ARE YOU AT RISK FOR

TYPE 2 **DIABETES?** A American Diabetes Association.



Diabetes Risk Test

-			
	How	old an	e vou?

Less than 40 years (0 points)

40-49 years (1 point)

50-59 years (2 points) 60 years or older (3 points)

Are you a man or a woman?

Man (1 point) Woman (0 points) If you are a woman, have you ever been diagnosed with gestational diabetes?

Yes (1 point) No (0 points)

Do you have a mother, father, sister, or brother with diabetes?

Yes (1 point) No (0 points)

Have you ever been diagnosed with high blood pressure?

Yes (1 point) No (0 points)

6 Are you physically active?

Yes (0 points) No (1 point)

What is your weight status? (see chart at right)

If you scored 5 or higher:

You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes (a condition that precedes type 2 diabetes in which blood glucose levels are higher than normal). Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanics/ Latinos, American Indians, and Asian Americans and Pacific Islanders.

Higher body weights increase diabetes risk for everyone.

Vrite	your	score
in t	he b	OX.















vour score.

пеідпі		weight (ibs.	,
4′ 10″	119-142	143-190	191+
4′ 11″	124-147	148-197	198+
5′ 0″	128-152	153-203	204+
5′ 1″	132-157	158-210	211+
5′ 2″	136-163	164-217	218+
5′ 3″	141-168	169-224	225+
5′ 4″	145-173	174-231	232+
5′ 5″	150-179	180-239	240+
5′ 6″	155-185	186-246	247+
5′ 7″	159-190	191-254	255+
5′ 8″	164-196	197-261	262+
5′ 9″	169-202	203-269	270+
5′ 10″	174-208	209-277	278+
5′ 11″	179-214	215-285	286+
6′ 0″	184-220	221-293	294+
6′ 1″	189-226	227-301	302+
6′ 2″	194-232	233-310	311+
6′ 3″	200-239	240-318	319+
6′ 4″	205-245	246-327	328+
	(1 Point)	(2 Points)	(3 Points)

You weigh less than the amount in the left column (0 points)

Adapted from Bang et al., Ann Intern Med 151:775-783, 2009.

Original algorithm was validated without gestational diabetes as part of the model.

Lower Your Risk

•

The good news is that you can manage your risk for type 2 diabetes. Small steps make a high

Prediabetes/Diabetes Screening

- Testing should be considered in overweight or obese (BMI ≥25 kg/m² or ≥23 kg/m² in Asian Americans) adults who have one or more of the following risk factors:
 - · First-degree relative with diabetes
 - High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
 - History of CVD
 - Hypertension (≥140/90 mmHg or on therapy for hypertension)
 - HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
 - Women with polycystic ovary syndrome
 - Physical inactivity
 - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)

Prevention or Delay of Type 2 Diabetes

□ At least annual monitoring for the development of diabetes in those with prediabetes is suggested

- ☐ Lifestyle Interventions:
 - Target 7% weight loss
 - Increase physical to at least 150 min/week
 - Behavioral strategies



Intensive lifestyle intervention could reduce the risk of incident type 2 diabetes by 58% over 3 years.

Evidence suggests that there is not an ideal percentage of calories from carbohydrate, protein, and fat to prevent diabetes.

Weight loss

☐ The recommended pace of weight loss was 1–2 lb/week.

□ Calorie goals were calculated by estimating the daily calories needed to maintain the participant's initial weight **and subtracting 500–700**calories/day (depending on initial body weight).

☐ The goal for physical activity was selected to approximate at least 700 kcal/week expenditure from physical activity. For ease of translation, this goal was described as at least 150 min



Physical Activity

- Aerobic
- Resistant
- Muscle flexibility and balance training



Pharmacotherapy to prevent Diabetes

- Metformin
- □ a-glucosidase inhibitors,
- □ Liraglutide
- □ Thiazolidinedione
- several weight loss medications like
 - Orlistat





Obesity Management for the Treatment of Type 2 Diabetes

Table 8.1—Treatment options for overweight and obesity in type 2 diabetes						
	BMI category (kg/m²)					
Treatment	25.0-26.9 (or 23.0-24.9*)	27.0-29.9 (or 25.0-27.4*)	≥30.0 (or ≥27.5*)			
Diet, physical activity, and behavioral therapy	†	t	†			
Pharmacotherapy		†	t			
Metabolic surgery			t			

PREVENTION OF VASCULAR DISEASE AND MORTALITY

Prediabetes is associated with heightened cardiovascular risk; therefore, screening for and treatment of modifiable risk factors for cardiovascular disease are suggested

- □ Tobacco use
 - □ HTN



Diabetes

FPG >=126 mg/dL. (no caloric intake for at least 8 h). OR

2-h PG >=200 mg/dL during an OGTT. OR

A1C >= 6.5%. OR

Classic symptoms + a random plasma glucose >=200 mg/dl



Assessment

Assessing risk of diabetes complications

ASCVD and heart failure history

ASCVD risk factors and 10-year ASCVD risk assessment

chronic kidney disease Hypoglycemia risk

Assessment for retinopathy

Assessment for neuropathy



Goal setting:

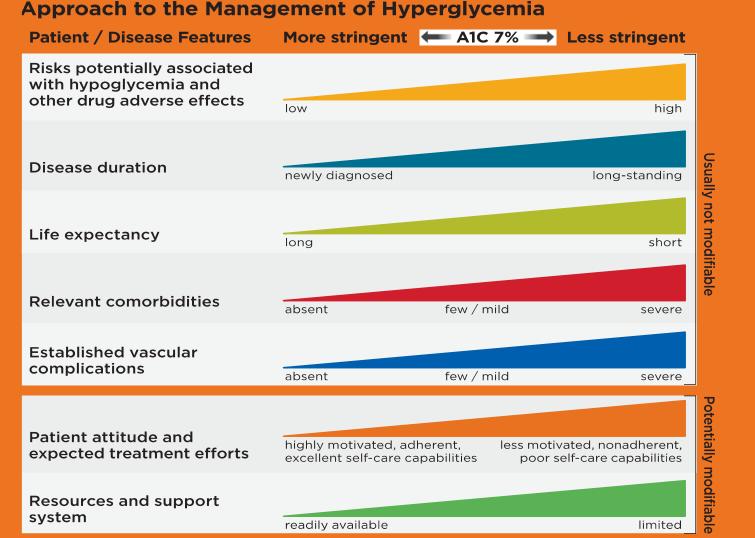
- ☐ Set A1C/blood glucose/time in range target
- ☐ If hypertension is present: establish blood pressure target
- Diabetes self-management goals



A1c Goal

- □ A reasonable A1C goal for many nonpregnant adults is <7%
- □ Consider more stringent goals (e.g. <6.5%) for select patients if achievable without significant hypos or other adverse effects.
- □ Consider less stringent goals (e.g. <8%) for patients with a history of severe hypoglycemia, limited life expectancy, or other conditions that make <7% difficult to attain.





Treatment plan

- ✓ Lifestyle management
- ✓ Pharmacologic therapy: glucose lowering
- ✓ Pharmacologic therapy: cardiovascular and renal disease risk factors
- ✓ Use of glucose monitoring and insulin delivery devices
- ✓ Referral to diabetes education and medical specialists



DIABETES TECHNOLOGY

This includes insulin delivery and glucose monitoring technology

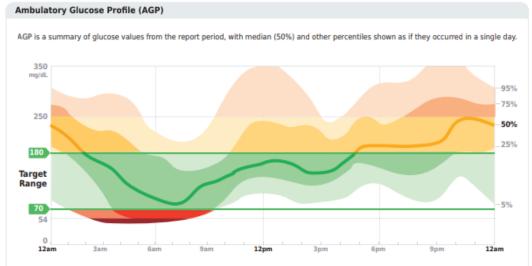
- □ Insulin pumps
- □ Connected insulin pens
- □ CGM system
- Hybrid devices that both monitor glucose and deliver
 Insulin



AGP Report: Continuous Glucose Monitoring









INDICATORS OF HIGH-RISK OR ESTABLISHED ASCVD, CKD, OR HF1

NO

 Choose later generation SU to lower risk of hypoglycemia, Glimepiride has shown similar CV safety to DPP-4i

7. Degludec / glargine U300 < glargine U100 / determir < NPH insulin

8. Semaglutide > liraglutide > dulaglutide > exenatide > lixisenatide

TZDs relatively more expensive and DPP-4i relatively cheaper

9. If no specific comorbidities (i.e. no established CVD, low risk of hypoglycemia

and lower priority to avoid weight gain or no weight-related comorbidities)

10. Consider country- and region-specific cost of drugs. In some countries

TO AVOID THERAPEUTIC INFERTA REASSESS AND MOOSEY THEATMENT REGULARLY C3-6 MONTHS)

COST IS A MAJOR ISSUE9-10

If A1C above target

If A1C above target

· Insulin therapy basal insulin

with lowest acquisition cost

Consider DPP-4i OR SGLT2i

with lowest acquisition cost10

TZD10

SU⁶

SU⁶

TZD10

CONSIDER INDEPENDENTLY OF BASELINE A1C OR INDIVIDUALIZED A1C TARGET

ASCVD PREDOMINATES

- Established ASCVD
- Indicators of high ASCVD risk (age ≥55 years with coronary, carotid or lower extremity artery stenosis >50%, or LVH)

PREFERABLY

GLP-1 RA with proven CVD benefit¹

SGLT2i with proven CVD benefit¹ if eGFR adequate²

If A1C above target

If further intensification is required or patient is now unable to tolerate GLP-1 RA and/or SGLT2i, choose agents demonstrating CV safety:

- For patients on a GLP-1 RA, consider adding SGLT2i with proven CVD benefit¹
- DPP-4i if not on GLP-1 RA
- Basal insulin⁴
- TZD⁶
- SU⁶

HF OR CKD PREDOMINATES

- Particularly HFrEF (LVEF <45%)
- CKD: Specifically eGFR 30-60 mL/min/1.73 m² or UACR >30 mg/g, particularly UACR >300 mg/g

PREFERABLY

SGLT2i with evidence of reducing HF and/or CKD progression in CVOTs if eGFR adequate³

If SGLT2i not tolerated or contraindicated or if eGFR less than adequate² add GLP-1 RA with proven CVD benefit¹

If A1C above target

- Avoid TZD in the setting of HF
- Choose agents demonstrating CV safety:
- For patients on a SGLT2i, consider adding GLP-1 RA with proven CVD benefit¹
- DPP-4i (not saxagliptin) in the setting of HF (if not on GLP-1 RA)
- Basal insulin⁴
- SU⁶

1. Proven CVD benefit means it has label indication of reducing CVD events

- Be aware that SGLT2I labelling varies by region and individual agent with regard to indicated level of GSFR for initiation and continued use
- Empagliflozin, canagliflozin and dapagliflozin have shown reduction in HF and to reduce CKD progression in CVOTs. Canagliflozin has primary renal outcome data from CREDENCE. Dapagliflozen has primary heart failure outcome data from DAPA-HF
- Degludec or U100 glargine have demonstrated CVD safety
- 5. Low dose may be better tolerated though less well studied for CVD effects

COMPELLING NEED TO COMPELLING NEED TO MINIMIZE MINIMIZE WEIGHT GAIN OR **HYPOGLYCEMIA** PROMOTE WEIGHT LOSS EITHER/ DPP-4i GLP-1 RA SGLT2i² TZD GLP-1 RA with good efficacy SGLT2i2 for weight loss⁸ If A1C If A1C If A1C If A1C above target above target above target above target If A1C above target GLP-1 BA SGLT2F SGLT2i2 SGLT2F OR OR DPP-4i DPP-4i OR OR GLP-1 RA with OR good efficacy TZD TZD SGLT2P for weight TZD GLP-1 RA loss⁸ If A1C above target If A1C above target Continue with addition of other agents as outlined above If quadruple therapy required, or SGLT2i and/or GLP-1 RA not If A1C above target tolerated or contraindicated, use regimen with lowest risk of weight gain Consider the addition of SU⁶ OR basal insulin: PREFERABLY Choose later generation SU with lower risk of hypoglycemia DPP-4i (if not on GLP-1 RA) based on weight neutrality Consider basal insulin with lower risk of hypoglycemia?

IF A1C ABOVE INDIVIDUALIZED TARGET PROCEED AS BELOW

2

If DPP-4i not tolerated or

contraindicated or patient already

on GLP-1 RA, cautious addition of:

SU⁶ • TZD⁶ • Basal insulin

agents in the U.S. Median AWP Dosage strength/ Median NADAC Maximum approved

Table 9.3—Median monthly (30-day) AWP and NADAC of maximum approved daily dose of noninsulin glucose-lowering

Class	Compound(s)	product (if applicable)	(min, max)†	(min, max)†	daily dose*
Biguanides	Metformin	850 mg (IR)	\$108 (\$5, \$109)	\$3	2,550 mg
		1,000 mg (IR)	\$87 (\$5, \$88)	\$2	2,000 mg
		1,000 mg (ER)	\$242 (\$242, \$7,214)	\$102 (\$102, \$430)	2,000 mg

1,000 mg (EK) \$242 (\$242, \$7,214) \$102 (\$102, \$430) Sulfonylureas (2nd Glimepiride 4 mg \$74 (\$71, \$198) \$3 generation) \$68 (\$67, \$70) \$3 Glipizide 10 mg (IR) \$48 \$12 10 mg (XL/ER)

 Glyburide 6 mg (micronized) \$52 (\$48, \$71) \$82 (\$63, \$93) 5 mg Pioglitazone 45 mg \$348 (\$7, \$349) Rosiglitazone N/A 4 mg

Linagliptin

Sitagliptin

\$11 \$12 \$5 Thiazolidinediones \$324

5 mg

100 mg

40 mg 20 mg 12 mg 20 mg 45 mg 8 mg

8 mg

5 mg

100 mg

\$106 (\$104, \$106) \$26 Acarbose 100 mg 300 mg

α-Glucosidase inhibitors Miglitol 100 mg \$284 (\$241, \$346) N/A 300 mg Meglitinides Nateglinide 120 mg \$155 \$28 360 mg

(glinides) \$878 (\$58, \$897) \$34 Repaglinide 2 mg 16 mg DPP-4 inhibitors \$234 \$166

25 mg Alogliptin 25 mg 5 mg \$549 \$438 5 mg Saxagliptin

\$583

\$596

\$466

\$477

SGLT2 inhibitors	 Ertugliflozin 	15 mg	\$372	\$297	15 mg
	 Dapagliflozin 	10 mg	\$639	\$511	10 mg
	Canagliflozin	300 mg	\$652	\$521	300 mg
	Empagliflozin	25 mg	\$658	\$526	25 mg
	· Empagimozin	25 1116	\$030	7320	25 1116
GLP-1 RAs	 Exenatide (extended release) 	2 mg powder for suspension or pen	\$909	\$727	2 mg**
	 Exenatide 	10 μg pen	\$933	\$746	20 μg
	 Dulaglutide 	4.5 mg mL pen	\$1,013	\$811	4.5 mg**
	Semaglutide	1 mg pen	\$1,022	\$822	1 mg**
	_	14 mg (tablet)	\$1,022	\$819	14 mg
	 Liraglutide 	1.8 mg pen	\$1,220	\$975	1.8 mg
	Lixisenatide	20 μg pen	\$814	N/A	20 μg
	- Limbertadae	20 1.8 10.11	+01.	.,,,,	20 1.5
Bile acid	 Colesevelam 	625 mg tabs	\$710 (\$674, \$712)	\$75	3.75 g
sequestrant		3.75 g suspension	\$674	\$222	3.75 g
Dopamine-2 agonist	Bromocriptine	0.8 mg	\$1,036	\$833	4.8 mg
Amylin mimetic	Pramlintide	120 µg pen	\$2,702	N/A	120 μg/injection††

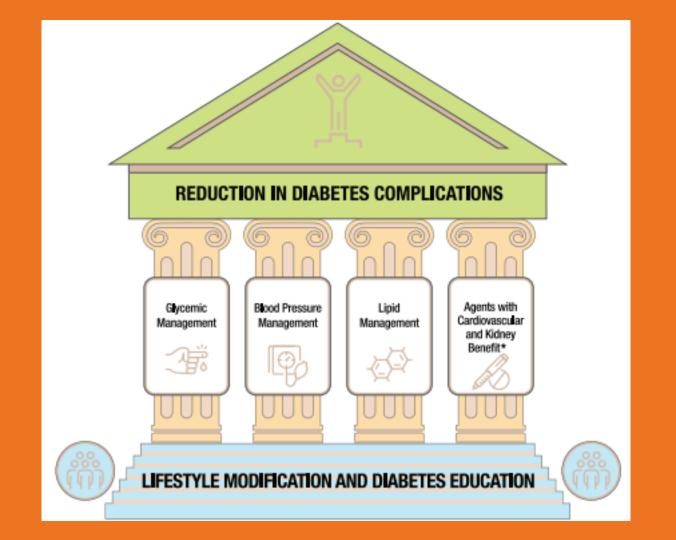
Insulin Therapy in T2DM

- ☐ The progressive nature of T2DM should be regularly & objectively explained to patients.
- ☐ Avoid using insulin as a threat, describing it as a failure or punishment.
- ☐ Give patients a self-titration algorithm



Table 9.4—Median cost of insulin products in the U.S. calculated as AWP (70) and NADAC (71) per 1,000 units of specified dosage form/product				
Insulins	Compounds	Dosage form/product	Median AWP (min, max)*	Median NADAC*
Rapid-acting	Lispro follow-on product Lispro Lispro-aabc Glulisine Aspart Aspart ("faster acting product")	U-100 vial U-100 prefilled pen U-100 prefilled pen U-100 prefilled pen U-200 prefilled pen U-100 vial U-100 prefilled pen U-100 prefilled pen U-100 prefilled pen U-100 vial U-100 prefilled pen U-100 vial U-100 cartridge U-100 prefilled pen U-100 cartridge U-100 refilled pen U-100 refilled pen U-100 cartridge	\$157 \$202 \$165† \$408 \$212† \$424 \$330 \$424 \$424 \$341 \$439 \$174† \$215 \$223† \$347 \$430	\$125 \$161 \$132† \$325 \$170† \$339 N/A N/A N/A \$272 \$352 \$139† \$172 \$179† \$278 N/A
	• Inhaled insulin	U-100 prefilled pen Inhalation cartridges	\$447 \$1,325	\$356 \$606
Short-acting	• human regular	U-100 vial U-100 prefilled pen	\$165++ \$208	\$132†† \$167
Intermediate-acting	• human NPH	U-100 vial U-100 prefilled pen	\$165++ \$208	\$132†† \$167
Concentrated human regular insulin	U-500 human regular insulin	U-500 vial U-500 prefilled pen	\$178 \$230	\$143 \$184
Long-acting	 Glargine follow-on products Glargine Detemir Degludec 	U-100 prefilled pen U-100 vial U-100 vial; U-100 prefilled pen U-300 prefilled pen U-100 vial; U-100 prefilled pen U-100 vial; U-100 prefilled pen; U-200 prefilled pen	\$118 \$190 (118, 261) \$340 \$340 \$370 \$407	\$96 \$95 \$277 \$272 \$296 \$325
Premixed insulin products	 NPH/regular 70/30 Lispro 50/50 Lispro 75/25 Aspart 70/30 	U-100 vial U-100 prefilled pen U-100 vial U-100 prefilled pen U-100 vial U-100 prefilled pen U-100 vial U-100 vial U-100 vial	\$165++ \$208 \$342 \$424 \$152 \$212 \$180 \$224	\$133++ \$167 \$274 \$338 \$273 \$170 \$144 \$179

Complications of Diabetes



Hypertension

☐ Individual with diabetes + HTN + 10 yrs ASCVD risk is low : Goal BP< 140/90 mm/hg

- ☐ Dm + HTN + high ASCVD risk : < 130/80 mm/hg
- □ Pregnant patients with diabetes and chronic hypertension was changed to suggest a blood pressure target of < 135/85 mmHg.



Cholesterol management

In adults not taking statins, a screening lipid profile is reasonable:

- At diabetes diagnosis
- At the initial medical evaluation
- And every 5 years, or more frequently if indicated

Obtain a lipid profile at initiation of statin therapy, and periodically thereafter

All Adults age > 40 yrs with type 2 Diabetes should be treated with moderate intensity statin unless contraindicated to prevent ASCVD



Screening for microvascular complications

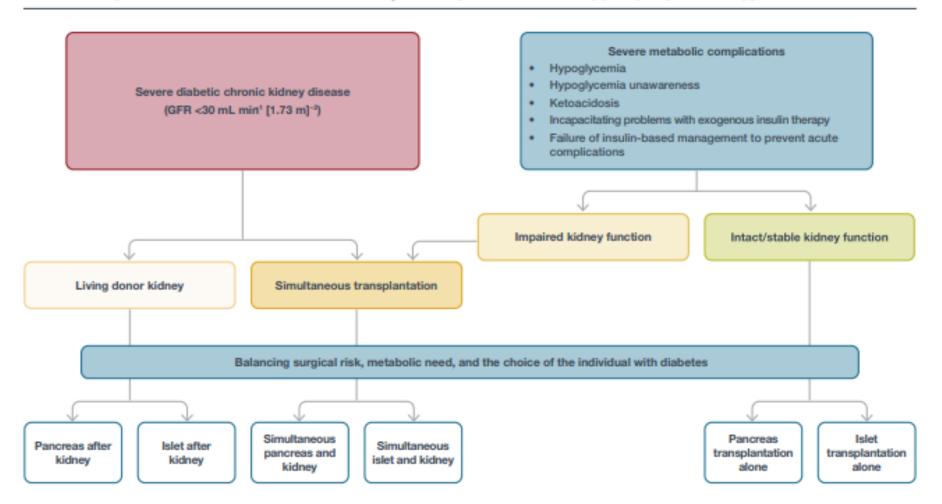
Patients with type 1 diabetes, within 5 years of diabetes onset.

Patients with type 2 diabetes at the time of diabetes diagnosis

- Once a year, assess urinary albumin and kidney function
- Initial dilated and comprehensive eye examination by an ophthalmologist
- □ 10-g monofilament testing and at least one of the following tests: pinprick, temperature, or vibration sensation.



Simplified overview of indications for β-cell replacement therapy in people with type 1 diabetes



Diabetes and Employment:

Any person with diabetes, whether insulin treated or non-insulin treated, should be eligible for any employment for which he or she is otherwise qualified

American Diabetes Association. Diabetes and employment.

Diabetes Care 2014;37(Suppl. 1):S112–S117; https://doi
.org/10.2337/dc14-S112 (first publication 1984; latest revision 2009)



How Type 2 Diabetes Affects Your Workforce

One in three U.S. adults has prediabetes—96 million people!

More than 8 in 10 don't even know they have it.

Prediabetes puts a person at increased risk for type 2 diabetes, heart attack, and stroke.



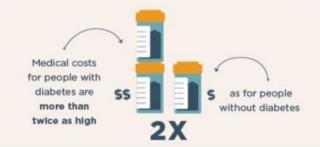


Total medical costs and lost work and wages for people with diagnosed diabetes

Risk of early death for adults with diabetes is



than for adults without diabetes



People who have diabetes are at higher risk of serious health complications:







DISEASE





LOSS OF TOES, FEET OR LEGS

Delivery and Dissemination of Lifestyle Behavior Change for Diabetes Prevention

CDC developed the **National DPP**: a resource designed to bring evidence-based lifestyle change programs for preventing type 2 diabetes to communities, including eligible Medicare patients.

An online resource includes locations of CDC-recognized diabetes prevention lifestyle change programs (cdc.gov/diabetes/prevention/find-a-program.html)



Thank you...



Titles are 30pt, two lines maximum.

Body copy is set in 14pt Montserrat. No dot points are needed when content is narrative and not in list form.

Photography and plenty of white space make your slides more audience-friendly.



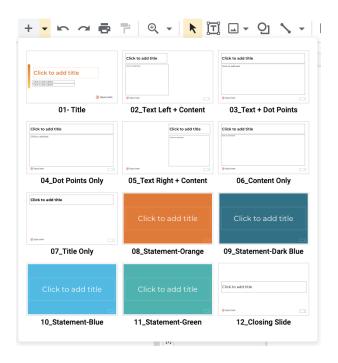


Another statement slide.

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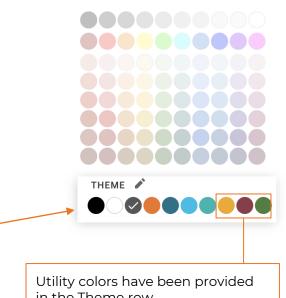




Color

Our color palette is bright and vivid. When working with our palette, it's best to keep it simple. Use these tips to help guide the process. Build from white. The use of white space within a design is just as important as the colors being used. Don't overuse color to fill space. It's important to maintain a sense of airiness in the design.

Do not use Google's default palette, our colors are listed under theme.



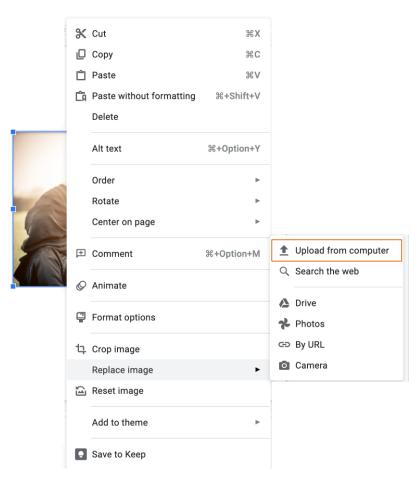
in the Theme row.



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- Use Insert>Image, drag & drop, or copy & paste to place an image into Slides.
 Images should never overlap text.
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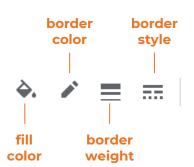


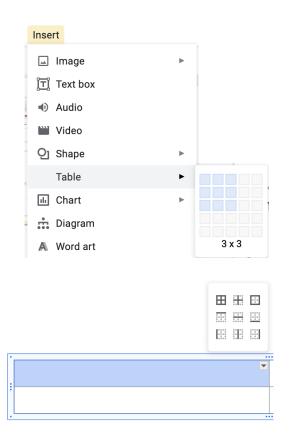
Tables

Insert>Table to create a table.

Styling tables:

- Click the small dropdown inside the cell to access all borders. You can also click directly on a border to adjust individual borders.
- Click inside of a cell and use the toolbar to add more color
- Use Shift+click to style multiple, individual elements in the table







Keep tables as uncluttered as possible.

| Title |
|-------|-------|-------|-------|-------|-------|-------|-------|
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| Text | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 |
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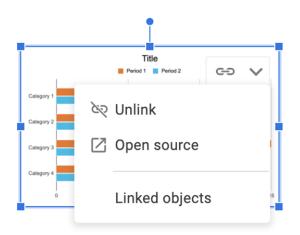


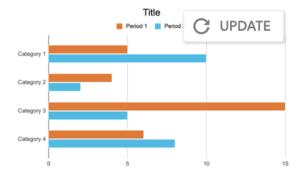
Charts must be created outside of Slides and placed in.

Insert>Image to insert your own chart

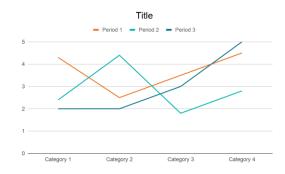
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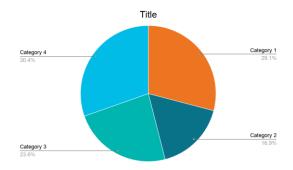
- <u>Follow these instructions</u> to create dynamic charts in Google Sheets.
 - Charts created in Sheets can link to your presentation. After editing your dataset in Sheets, update your chart by clicking the "Update" button

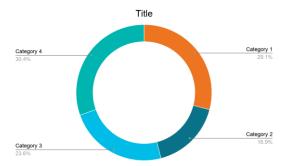










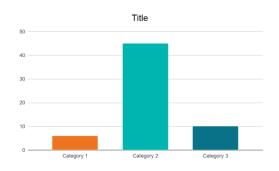


A line graph displays a series of data points.

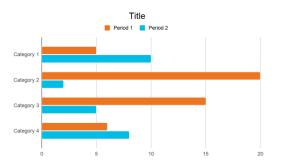
A pie chart displays proportions.

A doughnut chart is another type of pie chart. It displays the same kind of data as a traditional pie chart. Doughnut charts are stylistically more contemporary than pie charts.



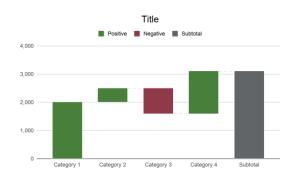




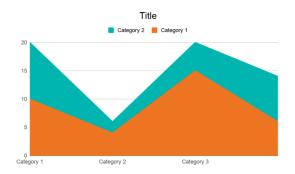


Horizontal bar charts compare quantities. Although bar charts and column charts can be used to display the same data, each is best suited for communicating a different type of information. Horizontal bar charts like this make it easy for the audience to compare quantities.





A waterfall chart shows a running total as values are added or subtracted. It's useful for understanding how an initial value is affected by a series of positive and negative values.



An area chart compares two or more quantities over a period of time.





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