Integrating Diabetes Screening into Oral Health

CareQuest Institute Continuing Education Webinar

Thursday, November 3, 2022

CareQuest Institute for Oral Health®

Housekeeping

- We will keep all lines muted to avoid background noise.
- We will send a copy of the slides and a link to the recording via email after the live program.
- We'll also make the slides and recording available on carequest.org.

To receive CE Credits:

- Look for the evaluation form, which we'll send via email within 24 hours.
- Complete the **evaluation by Friday, November 11.**
- Eligible participants will receive a certificate soon after via email.

We appreciate your feedback to help us improve future programs!

ADA C·E·R·P® | Continuing Education Recognition Program

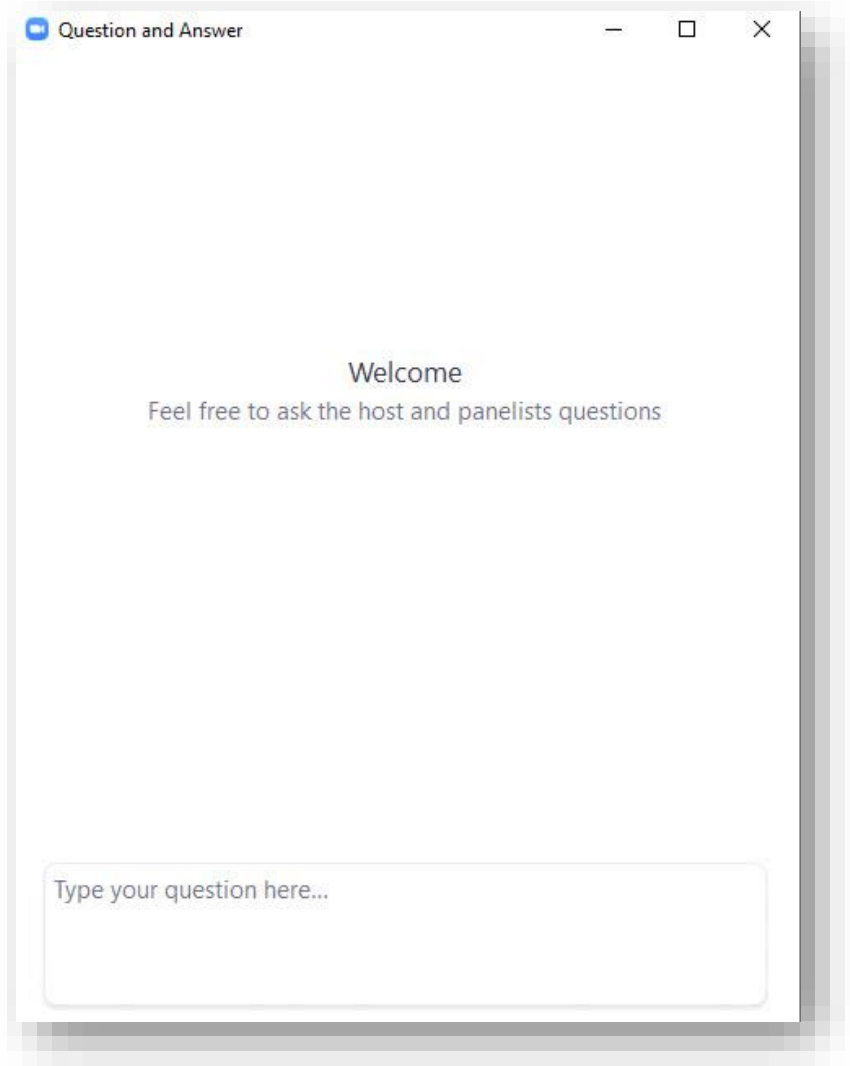
The CareQuest Institute for Oral Health is an ADA CERP Recognized Provider. This presentation has been planned and implemented in accordance with the standards of the ADA CERP.

*Full disclosures available upon request

CareQuest Institute for Oral Health®

Question & Answer Logistics

- Feel free to enter your questions into the **Question & Answer box** throughout the presentations.
- We will turn to your questions and comments toward the end of the hour.



CareQuest Institute for Oral Health

Learning Objectives

At the end of this webinar, you'll be able to:

- Recognize the role oral health providers can play in the early detection of diabetes.
- Recognize the role oral health providers can play in helping patients manage diabetes by linking them to medical care.
- Discuss the need to integrate diabetes screening into oral health care.
- Explain the process and workflow one oral health organization used to improve the early diagnosis of diabetes among its patient population.

Our Strategy

Vision

A future where every person can reach their full potential through optimal health

Mission

To improve the oral health of all

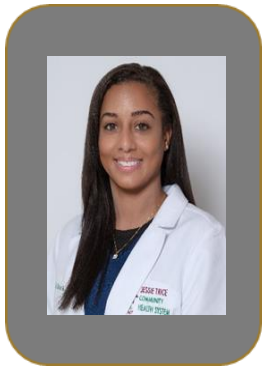
Purpose

To catalyze the future of health through oral health

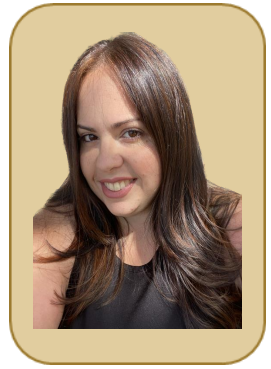
CareQuest Institute for Oral Health

Katherine Chung-Bridges, MD, MPH,
Director of Research,
Health Choice Network (HCN)

Hirut Kassaye, MPH,
Research Engagement and Project Administrator,
Health Choice Network (HCN)



Dr. Dana Walker,
General Dentist, Faculty
AEGD Residency Program,
Jessie Trice Community Health System INC



Ms. Yesenia Padron,
Lead Dental Assistant,
Jessie Trice Community Health System INC

CareQuest Institute for Oral Health

Integrating Diabetes Screening into Oral Health

Diabetes Integrated Care Prototype

Jessie Trice Community Health System was part of a research study called Diabetes Integrated Care Prototype (DICP) that involved five Health Choice Network (HCN) member centers.

The study looked at the intersection between oral health and diabetes.

Health Choice Network, Inc.

Health Choice Network, Inc. (HCN) is the first funded health center-controlled network, a successful nation-wide collaboration among health centers and partners.

Key Business Services to Improve Patient Outcomes

By providing key business services in finance, managed care, billing support, strategic initiatives and the latest in health information technology, participants can improve patient outcomes through increased efficiencies and more accessible care in underserved and uninsured communities.

NEARLY
3 MILLION
UNIQUE PATIENTS

60
SAFETY-NET ORGANIZATIONS

Jessie Trice Community Health System (JTCHS)

- Located in Miami, Florida, JTCHS became the **first Federally Qualified Health Center in Florida** and 5th in the nation 55 years ago.
- **Mission:** To improve quality of life and achieve health equity for all by providing access to innovative, quality, comprehensive primary health care.
- JTCHS owns and operates **11** comprehensive primary care centers, a 40-bed women's residential center for substance use treatment in one university, and 40 school-based health suites.

CareQuest Institute for Oral Health

Jessie Trice Community Health System (JTCHS), cont.

- JTCHS has five oral health practices and 45 oral health team members, including:
  - General dentists
  - Dental hygienists
  - 3 board-certified dentists in pediatric, periodontics, and oral surgery
  - Support staff
  - PEPPER, a humanoid robot (joined team three years ago)
- JTCHS hosts two 2 AEGD residency programs
  - New York University Dental Medicine Langone
  - Larkin Community Hospital in Miami

Epidemiology of Diabetes in the United States

Epidemiology of Diabetes of in the United States

Facts on Diabetes

- A total of **37.3 million** people in the United States (**11.3%** of the population) have diabetes.
- Of these, **28.7 million** people, including **28.5 million** adults have been diagnosed.
- ***The remaining 8.5 million*** *people (**23%** of adults)* ***are undiagnosed.***

CareQuest Institute for Oral Health

https://www.cdc.gov/diabetes/data/statistics-report/index.html

Epidemiology of Diabetes of in the United States

Facts on Diabetes

Prediabetes

- A total of **96 million** people aged 18 years or older in the United States (**38.0%** of the adult population) have prediabetes.

- **26.4 million** people aged 65 years or older (48.8%) have prediabetes.

CareQuest Institute for Oral Health

https://www.cdc.gov/diabetes/data/statistics-report/index.html

Epidemiology of Diabetes of in the United States

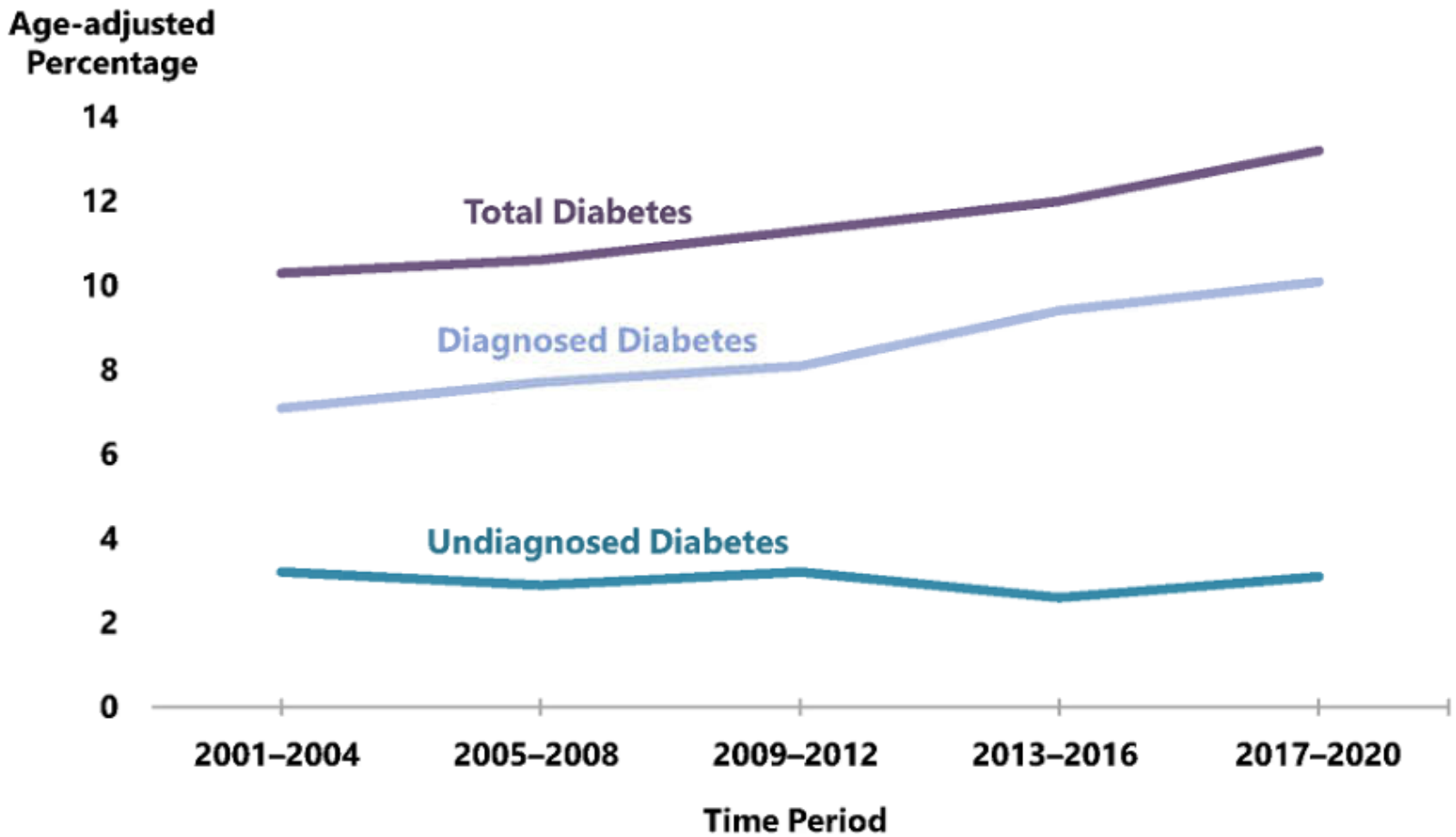
Trends in Prevalence of Diagnosed Diabetes, Undiagnosed Diabetes, and Total Diabetes

- During 2001–2020, age adjusted prevalence of total diabetes increased significantly among adults aged 18 years or older (Figure 1 on next slide).
- Prevalence estimates for diabetes were **10.3% in 2001-2004** and **13.2% in 2017-2020.**
- Age adjusted prevalence increased significantly for diagnosed diabetes during this period, but no significant change in undiagnosed diabetes prevalence was detected.

CareQuest Institute for Oral Health

https://www.cdc.gov/diabetes/data/statistics-report/diagnosed-undiagnosed-diabetes.html

Figure 1. Trends in age-adjusted prevalence of diagnosed diabetes, undiagnosed diabetes, and total diabetes among adults aged 18 years or older, United States, 2001–2020.



Notes: Diagnosed diabetes was based on self-report. Undiagnosed diabetes was based on fasting plasma glucose and A1C levels among people self-reporting no diabetes. Time period 2017–2020 covers January 2017 through March 2020 only.

Data source: 2001–March 2020 National Health and Nutrition Examination Surveys.

CareQuest Institute for Oral Health

Epidemiology of Diabetes of in the United States

Demography of Diabetes in the United States

- The percentage of adults with diagnosed diabetes is highest among:
  - American Indian/Alaska Natives – **14.5%**
  - Non-Hispanic Blacks – **12.1%**
  - Hispanics – **11.8%**
  - Non-Hispanic Asians – **9.5%**
  - Non-Hispanic Whites – **7.4%**
- Adults with a family income below the federal poverty have the highest prevalence for both men **(13.7%)** and women **(14.4%).**

CareQuest Institute for Oral Health

https://nationaldppcsc.cdc.gov/s/article/CDC-2022-National-Diabetes-Statistics-Report#:~:text=Jan%2026%2C%202022%E2%80%A2Article&text=The%20Centers%20for%20Disease%20Control,prediabetes%20in%20the%20United%20States

.

Epidemiology of Diabetes of in the United States

Economic Burden of Diabetes

Diabetes is the most expensive chronic condition in the United States

- **$1 in $4** in US health care costs is spent on caring for people with diabetes.
- Total estimated cost of Diabetes in 2017 was **$327 billion**, with **$237 billion** spent on direct medical cost, and $90 billion in reduced productivity.
- Economic cost of diabetes rose **26% from 2012 to 2017.**
- Approximately **61%** of diabetes costs are for people 65 years or older.
- Annual per capita health care expenditure is **2.3 times higher** for people with diabetes compared to those without diabetes.

CareQuest Institute for Oral Health

https://diabetesjournals.org/care/article/41/5/917/36518/Economic-Costs-of-Diabetes-in-the-U-S-in-2017

Value of Integrating Diabetes Screening in Dental Care

- An article in *The Journal of the American Dental Association*, among other research, found that integration of medical and dental care in the dental setting allows for closing medical care gaps such as recommended routine screenings.

- Patients receiving dental care in a setting that integrates with medical care have a higher likelihood of closing medical care gaps.

With both medical and dental services being available at Jessie Trice Community Health System, integration is being put into practice, with screening for diabetes as one example.

CareQuest Institute for Oral Health

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9573779/

Hirut Kassaye, MPH,
Research Engagement and Project Administrator,
Health Choice Network (HCN)
hkassaye@hcnetwork.org

CareQuest Institute for Oral Health

Clinical Review of Diabetes Screening

US Preventive Services Task Force Recommendation for Diabetes Screening

Recommendation Summary

Population	Recommendation	Grade
Asymptomatic adults aged 35 to 70 years who have overweight or obesity	The USPSTF recommends screening for prediabetes and type 2 diabetes in adults aged 35 to 70 years who have overweight or obesity. Clinicians should offer or refer patients with prediabetes to effective preventive interventions.	B

https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/screening-for-prediabetes-and-type-2-diabetes

CareQuest Institute for Oral Health

American Diabetes Association Professional Practice Committee. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2022. *Diabetes Care*. 2022;45(Suppl 1):S17-S38. doi:10.2337/dc22-S002

Table 2.3—Criteria for screening for diabetes or prediabetes in asymptomatic adults

1. Testing should be considered in adults with overweight or obesity (BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian Americans) 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)
2. Patients with prediabetes (A1C ≥5.7% [39 mmol/mol], IGT, or IFG) should be tested yearly.
3. Women who were diagnosed with GDM should have lifelong testing at least every 3 years.
4. For all other patients, testing should begin at age 35 years.
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.
6. People with HIV

CVD, cardiovascular disease; GDM, gestational diabetes mellitus; IFG, impaired fasting glucose; IGT, impaired glucose tolerance.

CareQuest Institute for Oral Health

American Diabetes Association Professional Practice Committee. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2022. *Diabetes Care*. 2022;45(Suppl 1):S17-S38. doi:10.2337/dc22-S002

Table 2.4—Risk-based screening for type 2 diabetes or prediabetes in asymptomatic children and adolescents in a clinical setting (254)

Screening should be considered in youth* who have overweight (≥85th percentile) or obesity (≥95th percentile) **A** and who have one or more additional risk factors based on the strength of their association with diabetes:

- Maternal history of diabetes or GDM during the child's gestation **A**
- Family history of type 2 diabetes in first- or second-degree relative **A**
- Race/ethnicity (Native American, African American, Latino, Asian American, Pacific Islander) **A**
- Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome, or small-for-gestational-age birth weight) **B**

GDM, gestational diabetes mellitus. *After the onset of puberty or after 10 years of age, whichever occurs earlier. If tests are normal, repeat testing at a minimum of 3-year intervals (or more frequently if BMI is increasing or risk factor profile deteriorating) is recommended. Reports of type 2 diabetes before age 10 years exist, and this can be considered with numerous risk factors.

CareQuest Institute for Oral Health

Symptoms of Diabetes

- Increased thirst and urination
- Increased hunger
- Fatigue
- Blurred vision
- Numbing or tingling of hands and feet
- Sores that do not heal
- Unexplained weight loss

CareQuest Institute for Oral Health

https://www.niddk.nih.gov/health-information/diabetes/overview/symptoms-causes#symptoms

Normal Insulin Function

Insulin is a key player in developing type 2 diabetes. This vital hormone—you can't survive without it—regulates blood sugar (glucose) in the body, a very complicated process. Here are the high points:

- The food you eat is broken down into blood sugar.
- Blood sugar enters your bloodstream, which signals the pancreas to release insulin.
- Insulin helps blood sugar enter the body's cells so it can be used for energy.
- Insulin also signals the liver to store blood sugar for later use.
- Blood sugar enters cells, and levels in the bloodstream decrease, signaling insulin to decrease too.
- Lower insulin levels alert the liver to release stored blood sugar so energy is always available, even if you haven't eaten for a while.

https://www.cdc.gov/diabetes/basics/insulin-resistance.html

Development of Insulin Resistance and Diabetes

- A *lot* of blood sugar enters the bloodstream.
- The pancreas pumps out more insulin to get blood sugar into cells.
- Over time, cells stop responding to all that insulin—they've become insulin resistant.
- The pancreas keeps making more insulin to try to make cells respond.
- Eventually, the pancreas can't keep up, and blood sugar keeps rising.

https://www.cdc.gov/diabetes/basics/insulin-resistance.html

Diagnosis of Diabetes

- Diabetes is diagnosed at blood glucose of greater than or equal to 200 mg/dl

Result	A1C
Normal	less than 5.7%
Prediabetes	5.7% to 6.4%
Diabetes	6.5% or higher

Result	Oral Glucose Tolerance Test (OGTT)
Normal	less than 140 mg/dl
Prediabetes	140 to 199 mg/dl
Diabetes	200 mg/dl or higher

Result	Fasting Plasma Glucose (FPG)
Normal	less than 100 mg/dl
Prediabetes	100 mg/dl to 125 mg/dl
Diabetes	126 mg/dl or higher

CareQuest Institute for Oral Health

https://diabetes.org/diabetes/a1c/diagnosis

What Does the Hemoglobin A1C Measure?

- When sugar enters the bloodstream, it attaches to hemoglobin, a protein in red blood cells.
- Everybody has some sugar attached to red blood cells, but people with higher blood sugar levels have more.
- The A1C test measures the percentage of your red blood cells that have sugar-coated hemoglobin.

CareQuest Institute for Oral Health

https://www.cdc.gov/diabetes/managing/managing-blood-sugar/a1c.html

Hemoglobin A1C and Estimated Average Glucose

%	mg/dl
6	126
6.5	140
7	154
7.5	169
8	183
8.5	197
9	212
9.5	226
10	240

CareQuest Institute for Oral Health

https://diabetes.org/diabetes/a1c

Table 2. Conditions Associated with Falsely Elevated or Lowered A1c

Condition	Effect on A1c	Comments
Anemias associated with decreased red cell turnover	False Increase	I.e., iron deficiency, vitamin B-12, folate deficiency anemias
Asplenia	False Increase	Increased erythrocyte lifespan
Uremia	False Increase	Formation and detection of carbamyl-hemoglobin
Severe hypertriglyceridemia	False Increase	When level >1,750 mg/dL
Severe hyperbilirubinemia	False Increase	When level >20 mg/dL
Chronic alcohol consumption	False Increase	Formation of acetaldehyde-HbA1 compound
Chronic salicylate ingestion	False Increase	Mechanism uncertain, may interfere with assay
Chronic opioid ingestion	False Increase	Mechanism uncertain
Lead poisoning	False Increase	Mechanism uncertain
Anemia from acute or chronic blood loss	False Decrease	Includes hemolytic anemia
Splenomegaly	False Decrease	Decreased erythrocyte lifespan
Pregnancy*	False Decrease	Decreased erythrocyte lifespan
Vitamin E ingestion	False Decrease	Reduced glycation
Ribavirin and interferon-alpha	False Decrease	Possibly due to hemolytic anemia
Red blood cell transfusion†	False Increase or False Decrease	High glucose concentration in storage medium (False Increase) Dilutional effect (False Decrease)
Hemoglobin variants	False Increase or False Decrease	Depends on method and assay used A1c generally reliable for heterozygous variants, but not homozygous variants (See Table 3)
Vitamin C ingestion	False Increase or False Decrease	May increase A1c when measured by electrophoresis May decrease levels when measured by chromatography due to competitive inhibition of glycosylation

**Expect falsely low A1c values through the 2nd trimester, but may rise during the 3rd trimester*
†Typically reported to falsely elevate A1c, but may also result in false decrease

CareQuest Institute for Oral Health

Radin MS. Pitfalls in hemoglobin A1c measurement: when results may be misleading. J Gen Intern Med. 2014 Feb;29(2):388-94. doi: 10.1007/s11606-013-2595-x. Epub 2013 Sep 4. PMID: 24002631; PMCID: PMC3912281.

Katherine Chung-Bridges, MD, MPH,
Director of Research,
Health Choice Network (HCN)
KChung@hcnetwork.org

CareQuest Institute for Oral Health

Role of Oral Health Providers in Early Detection of Diabetes

Diabetes in the Dental Setting

- As noted earlier, according to the CDC, **37.3 million** persons in the US have diabetes.
- **23%** are undiagnosed: approximately 8.5 million persons.
- Because of how prevalent diabetes is, dentists are likely to encounter patients with diabetes.

CareQuest Institute for Oral Health

https://www.cdc.gov/diabetes/data/statistics-report/index.html

Diabetes in the Dental Setting

Possible complications include:

- Progressive damage to nerves & blood vessels
- Stroke
- Progressive dental disease
- Heart disease
- Blindness
- Amputations

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis Accessed October 10, 2022.

Diabetes in the Dental Setting

- In the FQHC system, we often see patients who go years without seeing a PCP, but they may first present to the dental office.
- Provides a great opportunity for screening patients who may be at risk and connect them to appropriate follow-up care.

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022.

Signs Dentists May Notice During Dental Exams

- Obesity-particularly central obesity
- Older than 45 years old
- Close relatives with diagnosis of diabetes
- Acanthosis nigricans
- No PCP visit in the last year

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022.

Symptoms Patients May Report

- Increased hunger
- Increased urine output
- Increased thirst
- Dry mouth
- “Shaking teeth”
- Mouth odor
- Burning sensation of the mouth

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022.

Oral Manifestations of Uncontrolled Diabetes

- Xerostomia
- Burning sensation of the oral mucosa
- Impaired/delayed wound healing
- Increased incidence or severity of dental caries and infections
- Increased incidence of Candidiasis infection
- Enlargement of the parotid gland
- Progressive and severe periodontitis

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022.

Management in the Dental Office

- HBA1C testing for persons who are identified as high-risk
- Referral to Jessie Trice Medical or patient's PCP when HBA1C > 5.6%
- Educate patients about the importance of follow-up
- Educate patients about the bi-directional relation of diabetes and periodontal disease

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022.

Referrals According to HBA1C levels

HBA1C is **5.7%-6.4%** (pre-diabetes): Patient is given a referral and provided with an appointment.

•HBA1C is **6.5%-8%** (diabetic): Patient is given an appointment for medical services within 3 days.

•HBA1C is **>8%**: Patient is given a same-day appointment for medical services.

CareQuest Institute for Oral Health

Diabetes. American Dental Association. https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/diabetes#:~:text=Oral%20manifestations%20of%20uncontrolled%20diabetes,gingivitis%3B%20and%2For%20periodontitis. Accessed October 10, 2022

Dr. Dana Walker,
General Dentist, Faculty AEGD Residency Program,
Jessie Trice Community Health System INC
DTWalker@jtchs.org

CareQuest Institute for Oral Health

Diabetes Screening Workflow in the Dental Department - JTCHS

Process of Testing

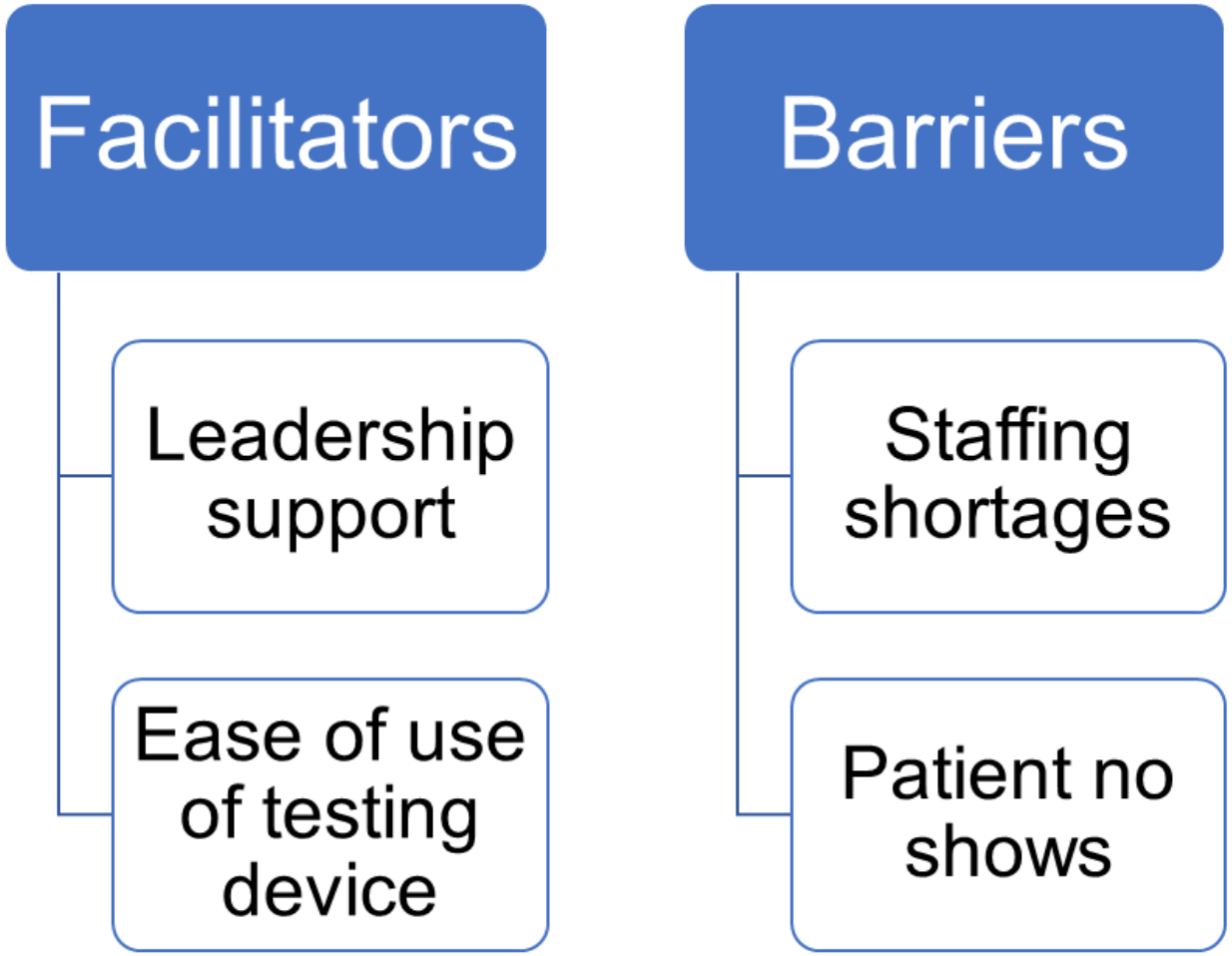
- Dentist first suggests the possibility of A1C testing in office.
- Common questions I get from patients.
- Once patient agrees, dental assistant comes in to perform test.
- A point-of care HBA1C test is performed on patient by trained DA.
- Dentist will discuss the results of the test with patient and make appropriate referrals as indicated. Follow-up calls are initiated if indicated.
- We have systems in place to refer patients directly to a JTCHS medical provider if patient agrees.
- > 80% of staff has been trained to perform A1C screenings.

CareQuest Institute for Oral Health

Ms. Yesenia Padron,
Lead Dental Assistant,
Jessie Trice Community Health System INC
YPadron@jtchs.org

CareQuest Institute for Oral Health

Facilitators and Barriers We Noted



CareQuest Institute for Oral Health

Feedback from Patients (JTCHS and Other Sites)

Is this your first-time screening for diabetes?

- 342 (57%) Yes
- 263 (43%) No

On a scale of 1-4, how comfortable were you having diabetes screening at your dental office?

- 590 (97%) Very comfortable/Comfortable
- 19 (3%) Very uncomfortable/Uncomfortable

Overall, how would you rate your experience having an A1c testing done in a dental office?

- 595 (98%) Good/Great experience
- 11 (2%) Fair experience

Do you intend on following up with your primary care provider at the request of your oral health provider?

- 571 (95%) Yes
- 33 (5%) No

An Example to Illustrate Patient Impact

- A patient was recruited to the study and had an **A1C level of 9.3**.
- The work of the DICP allowed this patient to receive education about the significance of their A1C level and got **connected to follow up care** at their PCP quickly.
- The patient was extremely **grateful to receive this type of testing** and have a better understanding of their health.
- The patient had faced multiple barriers to accessing care. This was a great example of how **integrated care can impact social determinants of health** in a positive way.

CareQuest Institute for Oral Health

- “The DICP has **given us confidence in health testing in the dental setting** and we are considering expanding to other health testing.”

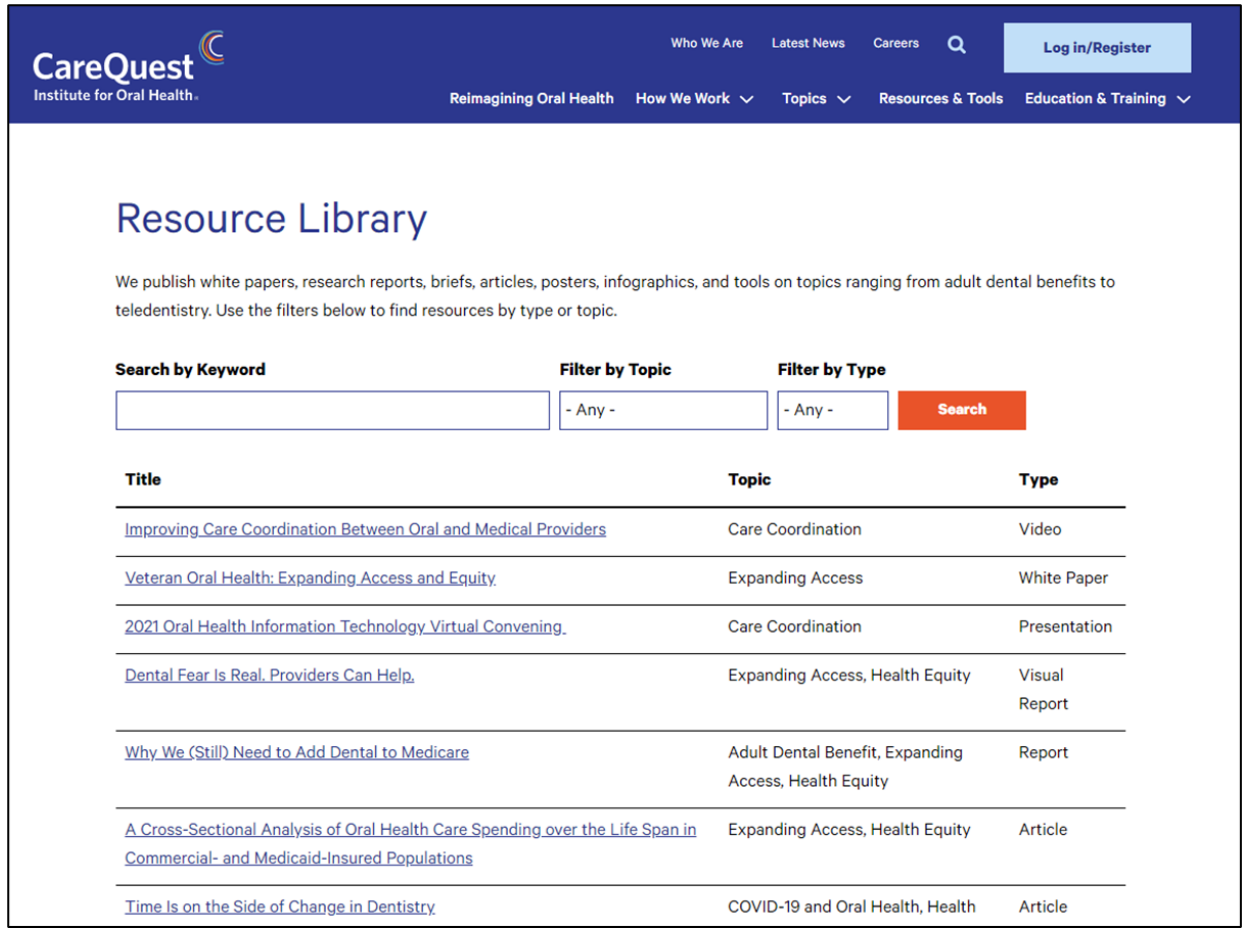
- “The DICP has **provided opportunities for patient education** and increased care coordination efforts with medical.”

- “Sharing the success and results of the DICP with stakeholders has **inspired conversations in our organization around other opportunities for integration**.”

CareQuest Institute for Oral Health

Question and Answer

To Explore More Industry-Leading Research



www.carequest.org/education/resource-library

CareQuest Institute for Oral Health

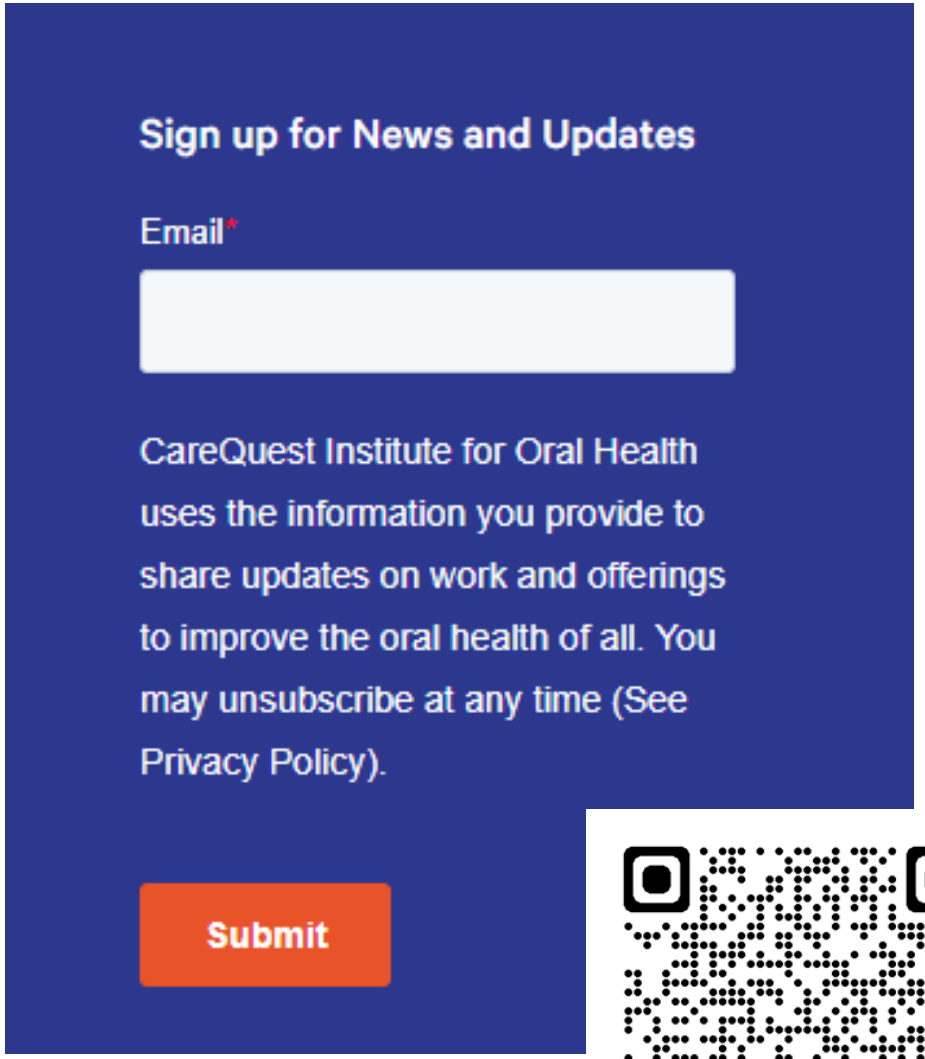
Webinar Evaluation

Complete the **evaluation by Friday, November 11** to receive CE credit. You will receive a link to the survey within 24 hours.

Next Webinar:

Tuesday, November 15, 2022, 1–2 p.m. ET
Communication Strategies for Productive Patient Conversations

Sign up to receive our newsletter to get more information on future webinars!



CareQuest Institute for Oral Health

Stay Connected

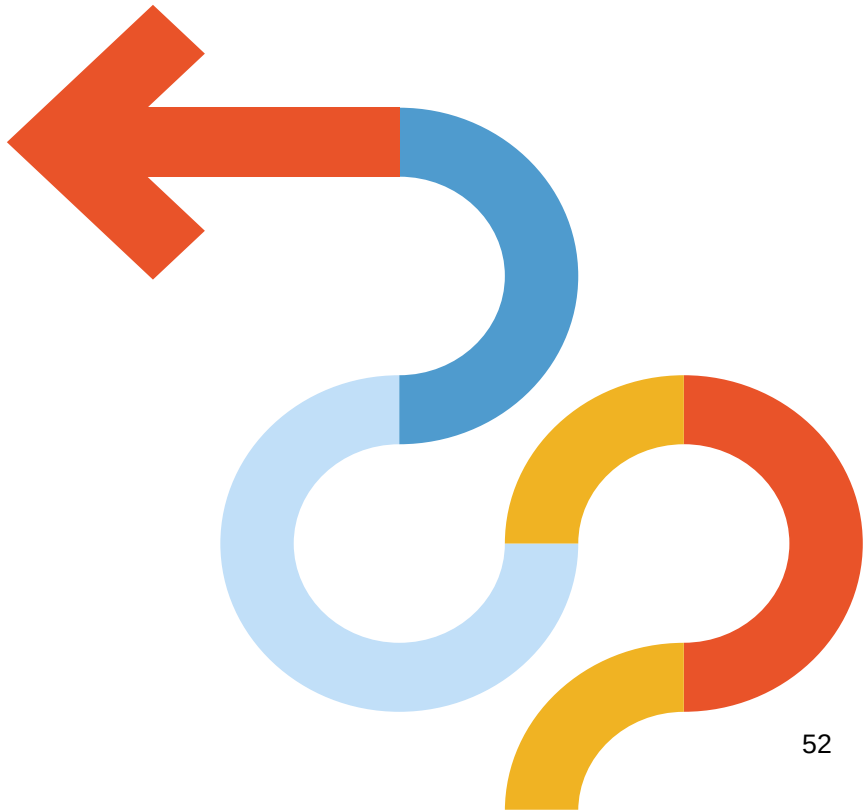
Follow us on social media

@CareQuestInstitute

@CareQuestInstitute

@CareQuestInst

CareQuest Institute



CareQuest Institute for Oral Health

CareQuest Institute for Oral Health®