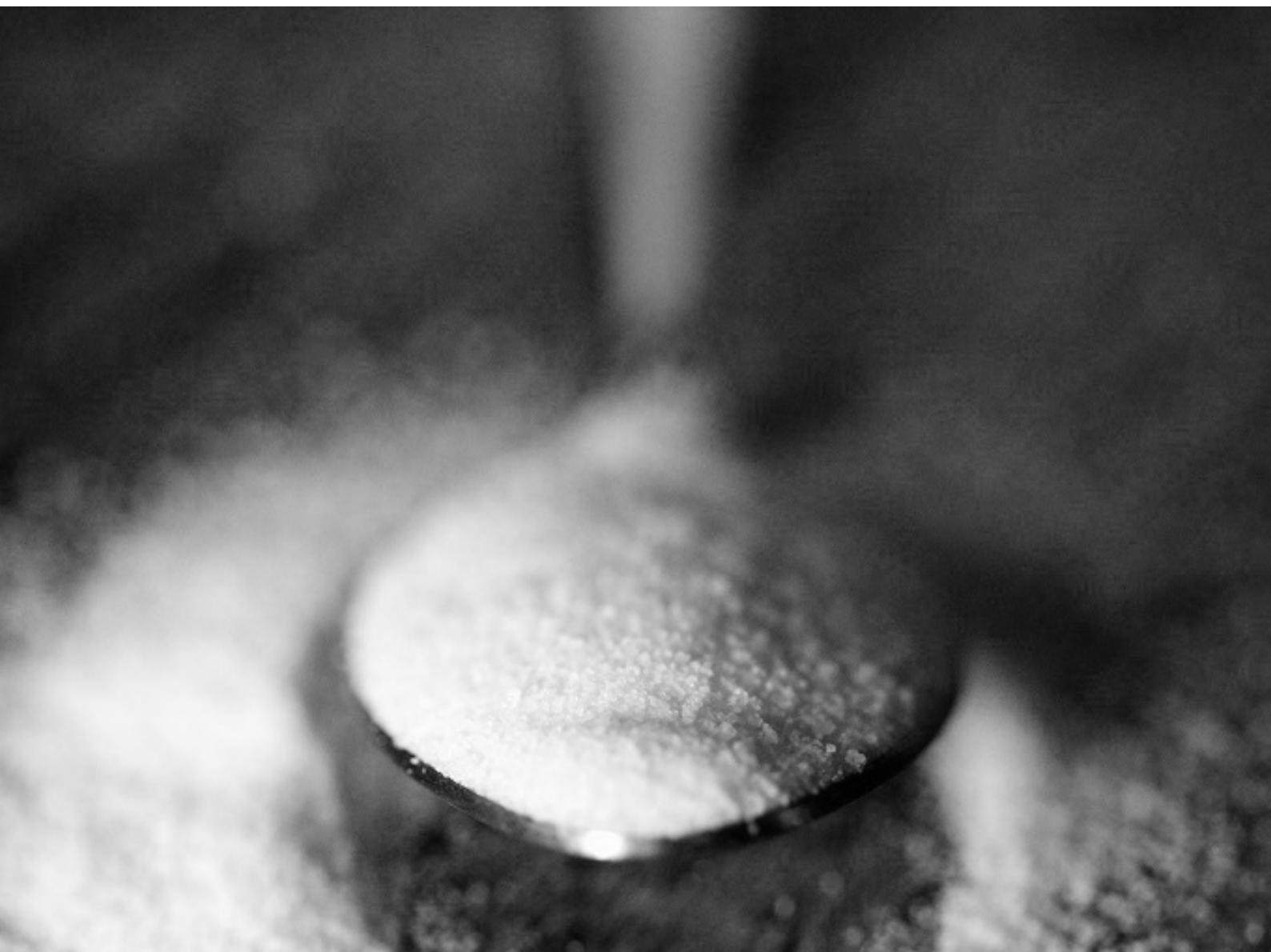




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DIABETES

| **A Double Threat to Self-Insured Employers**

OUR EXECUTIVE SUMMARY

Diabetes is a high-cost chronic condition that also has a high prevalence among US adults, making it a double threat to employers trying to offer health insurance to employees and their dependents.

Diabetes occurs when blood sugar levels are too high because the body isn't producing the insulin required to move sugar from the bloodstream to the body's cells required for energy. Too much sugar in the bloodstream can cause serious health problems, which is why diabetes prevention and management is so important in controlling health costs.

There are two main types of diabetes. Type 1, which affects 5% of the population and requires insulin replacement. Type 2, the most common form, affects 95% of the population. For type 2 diabetes, the body is resistant to insulin and can be managed with medication and/or diet and exercise. However, even patients that are adherent to their medication still fail to meet their desired A1C goals for successful diabetes management.

There are many solutions in the market to treat diabetes, but taking a disease specific approach is not the best approach for a patient with diabetes. According to Tria Health's book of business, 92% of patients with diabetes have at least one other condition and 73% have three or more. With each additional condition, healthcare costs rise exponentially and the patient's quality of life suffers.

Successful diabetes management requires an understanding of the unique barriers that keep an individual patient from achieving their clinical goals. With this knowledge, a qualified professional can provide the education and tools necessary to help patients effectively manage their diabetes and other conditions. Due to the unique needs of every patient, a personal consultative approach, supported by data and technology, is a proven method that works.

Tria Health has been able to reduce A1C levels for members of self insured employers by 1.3% points. In addition, through an analysis of medical and pharmacy claims, Tria Health found that patients with diabetes who engaged with a Tria Health pharmacist for one-on-one coaching, had fewer poor health outcomes relating to the mismanagement of diabetes. Costs for these patients were \$2,328 less in 2018 than members identified with diabetes who did not engage with Tria Health.

Note: Statistics quoted in the Executive Summary are sourced throughout the white paper.

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1

DIABETES MANAGEMENT IS IMPORTANT IN CONTROLLING OVERALL HEALTH CARE COSTS

HIGH COST & HIGH PREVALENCE MAKE DIABETES A DOUBLE THREAT

According to the American Diabetes Association, diabetes is a chronic condition that affects approximately 1 in 10 Americans.¹ Additionally, one in four Americans do not even know they have diabetes.¹ The risk of death is 50% higher for those with diabetes than those without, making it the 7th leading cause of death in the United States.¹ The American Diabetes Association also reports that the average health care spend is 2.3 times higher for a person with diabetes and those costs increase exponentially when diabetes is not properly controlled.

These costs are both direct and indirect. Direct costs include hospital inpatient care, prescriptions to treat complications of diabetes, diabetes medications and supplies and physician office visits. Indirect costs include increased absenteeism, reduced productivity, inability to work related to disability and lost productivity due to early mortality. The total economic burden has increased 26% in 5 years from \$245B in 2012 to \$327B in 2017.¹ This financial burden and the overall impact on a patient's health emphasizes the importance of reducing the impact of diabetes through better identification, education, treatment and prevention of diabetes.



THE ECONOMIC BURDEN OF DIABETES¹

THE ECONOMIC BURDEN	TOTAL	PER PERSON WITH DIABETES	% OF POPULATION
DIAGNOSED	\$327.2B	\$13,240	23.1M (9.4%)
UNDIAGNOSED	\$31.7B	\$4,250	7.2M (2.9%)

2



WHAT'S SUGAR GOT TO DO WITH IT?

Diabetes occurs when blood glucose, also called blood sugar, is too high. Blood glucose is the body's main source of energy and comes from the food we eat. When food is digested, sugar enters the bloodstream. Insulin, a hormone made by the pancreas, helps glucose move from the bloodstream to the body's cells to be used for energy. Sometimes the body doesn't make enough—or any—insulin or doesn't utilize the insulin appropriately. When this happens, the glucose stays in blood and doesn't reach cells.

Over time, having too much glucose in the blood system can cause health problems. Although diabetes has no cure, it can be managed to stay healthy.

TYPES OF **3 | DIABETES**

THE MOST COMMON TYPES OF DIABETES
ARE TYPE 1 AND TYPE 2



TYPE 1

Affects 5%. The Body Requires Insulin Replacement.

With Type 1 diabetes, the body does not make insulin. The immune system attacks and destroys the cells in your pancreas that makes insulin. Approximately 5% of the people with diabetes have Type 1 diabetes and it is usually diagnosed in children and young adults, although it can appear at any age.

Type 1 diabetes is largely unrelated to weight or diet. Exact causes of Type 1 diabetes are typically related to genetics and family history. Type 1 diabetes can be managed by taking insulin every day. Increasingly, people with Type 1 diabetes are utilizing insulin pumps that release insulin in a steady flow throughout the day. While this can help manage Type 1 diabetes, there is no cure.



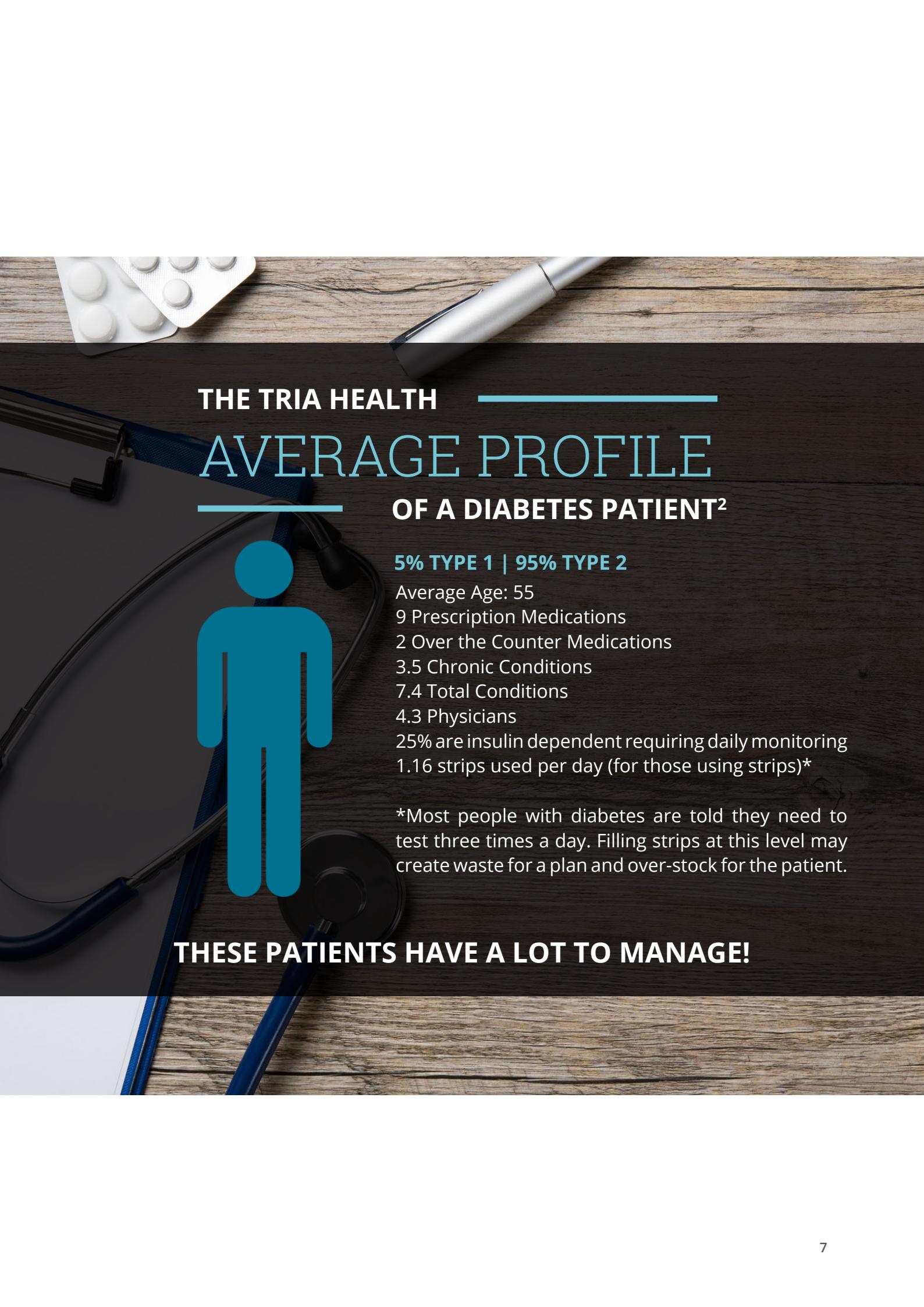
TYPE 2

Affects 95%. The Body Can't Process Insulin Efficiently.

Type 2 diabetes is the most common form of diabetes. 95% of people with diabetes are diagnosed with type 2. Although it can happen at any age, most people are middle-aged or older when they are diagnosed. With this type of diabetes, the body has a difficult time metabolizing sugar required for energy. Either the pancreas does not produce enough insulin or the body has become resistant to its effects. This causes glucose to build in the blood, causing hyperglycemia, or high blood glucose. Several factors can contribute to this, including eating more carbohydrates than normal and being less physically active. Over time, untreated hyperglycemia can cause major health complications.

Type 2 diabetes is diagnosed using a glycated hemoglobin (A1C) test to determine the average blood sugar level in the body's system. Normal levels are below 5.7%; 5.7% - 6.4% is considered prediabetes and if A1C levels are above 6.5% on two separate occasions, a doctor will diagnose an individual with diabetes. However, the American Diabetes Association recommends maintaining A1C levels below 7% for most people.

Type 2 diabetes can be life-threatening, but can be managed effectively with medication, diet and exercise.



THE TRIA HEALTH AVERAGE PROFILE OF A DIABETES PATIENT²



5% TYPE 1 | 95% TYPE 2

Average Age: 55

9 Prescription Medications

2 Over the Counter Medications

3.5 Chronic Conditions

7.4 Total Conditions

4.3 Physicians

25% are insulin dependent requiring daily monitoring

1.16 strips used per day (for those using strips)*

*Most people with diabetes are told they need to test three times a day. Filling strips at this level may create waste for a plan and over-stock for the patient.

THESE PATIENTS HAVE A LOT TO MANAGE!

4 | THE IMPACT OF DIABETES

MONEY & TIME

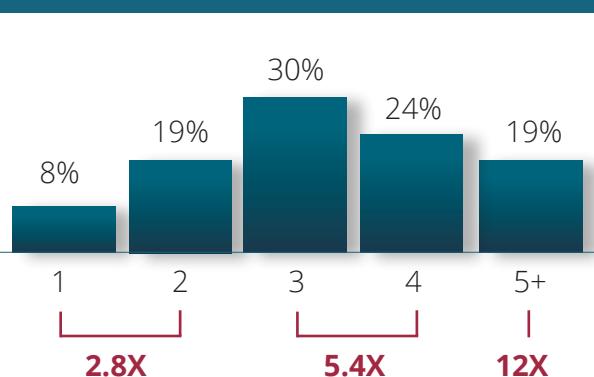
92% OF MEMBERS WITH DIABETES HAVE ANOTHER CHRONIC CONDITION

Members with diabetes are likely to have other chronic conditions. According to the Multiple Chronic Conditions Chartbook that tracks the cost of chronic conditions over time, the more chronic conditions a member has, the higher the health care costs.³ A person with 3 chronic conditions is 5.4 times the cost of a person with no chronic conditions.

Across the Tria Health book of business, 92% of members with Diabetes have at least one other chronic condition. Over half of these members have high blood pressure, high cholesterol and/or suffer from pain.

Not managing any one of these conditions can lead to serious health risks and costs.

92% OF MEMBERS WITH DIABETES HAVE 2 OR MORE CHRONIC CONDITIONS



²Based on Tria Health 2018 Book of Business

³Multiple Chronic Conditions Chartbook, 2014

Asthma/COPD 14%

Heart Disease 15%

High Blood Pressure 72%

High Cholesterol 63%

Mental Health 41%

Migraines 2%

Osteoporosis 2%

Pain 52%

PERCENT OF MEMBERS WITH DIABETES WITH ANOTHER CHRONIC CONDITION²

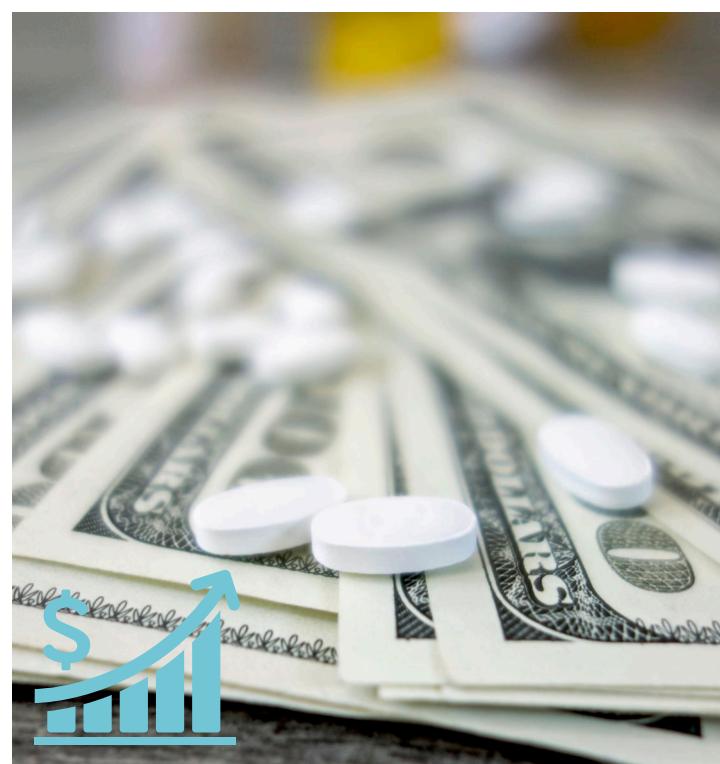
THE COST

Members with Diabetes cost 2.3 times more than members without⁴

According to the American Diabetes Association, people with diabetes have medical expenditures that are 2.3 times higher than those without diabetes. Additionally, 1 in 4 health care dollars in the US is spent in care for people diagnosed with diabetes and more than half of that expenditure is directly attributable to diabetes.

Tria Health analyzed healthcare utilization and costs for members of self-insured employers with diabetes. Members were identified as having diabetes based on medications in pharmacy claims and ICD10 codes in medical claims. Identified members were then split into two cohorts: those that engaged with a Tria Health pharmacist for a one-on-one consultation and those that did not engage. Members that engaged with a Tria Health pharmacist for a comprehensive medication review, as well as lifestyle and condition education for behavior modifications, showed lower cost of poor outcomes than those that did not engage with Tria Health. Poor outcomes are defined as the cost and utilization of health outcomes specifically related to diabetes. For example, the cost and utilization associated with a kidney infection for a person diagnosed with diabetes is a poor health outcome. However, the cost of a broken arm for that same patient is not considered a poor outcome of diabetes.

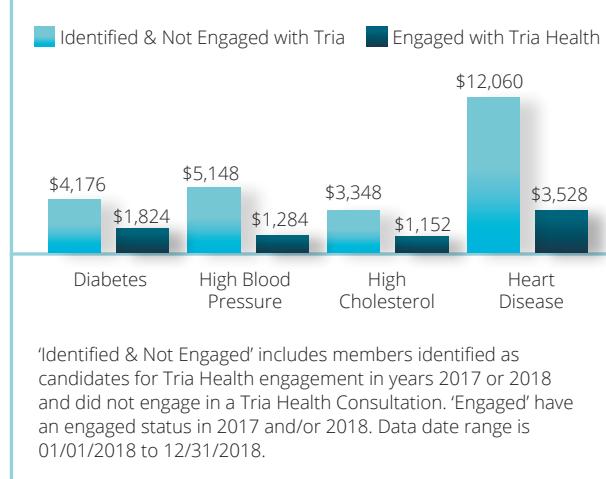
As part of the analysis, the cost of poor outcomes for other disease states related to diabetes were analyzed showing that a consultation with a Tria Health pharmacist has a positive impact not only for diabetes, but also those disease states that are related to diabetes.



COST OF POOR OUTCOMES FOR MEMBERS WITH DIABETES⁵



COST OF POOR OUTCOMES FOR MEMBERS WITH DIABETES⁵



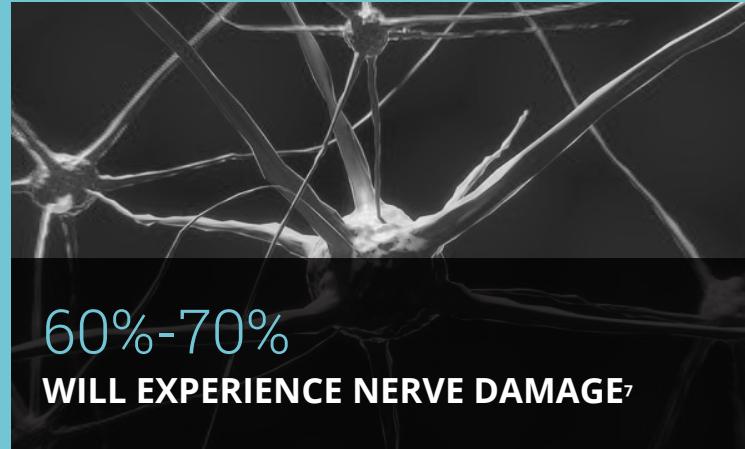
THE TIME: DIABETES IMPACTS QUALITY OF LIFE

The impact of diabetes is not only cost, but at a patient level, there is also a quality of life factor to consider. The average Tria Health patient with diabetes has multiple conditions, takes multiple medications and sees multiple physicians. It's a lot for one patient to manage.



57.4%

**ADULTS HAVE ATTENDED A
SELF-MANAGEMENT CLASS
ONLY 6.8% FOR NEWLY DIAGNOSED⁶**



60%-70%
WILL EXPERIENCE NERVE DAMAGE⁷



1 IN 3

**ADULTS DIABETICS HAVE
CHRONIC KIDNEY DISEASE⁷**



20%

EXPERIENCE IMPARED VISION OR BLINDNESS⁷



50% OF THESE WILL DIE WITHIN
TWO YEARS OF AMPUTATION⁷

1 IN 200

**PEOPLE WITH DIABETES
ULTIMATELY HAVE A
LIMB AMPUTATED⁸**



2-4X

**MORE LIKELY TO DIE OF
HEART DISEASE THAN
THOSE WITHOUT⁹**

In addition, people with diabetes are more likely to have high blood pressure, cholesterol abnormalities, be obese, be less physically active and smoke. These are risk factors associated with diabetes that when not controlled can lead to complex health problems and even death.

DIABETES TREATMENT

ONE SIZE

DOES NOT FIT ALL

Treatment for diabetes often focuses on controlling the disease and preventing known diabetes complications. The first goal of treatment typically focuses on management of blood glucose levels. Controlling blood sugar is important because it reduces the risk of cardiovascular complications. Due to the fact that most people with diabetes also have high blood pressure and abnormal cholesterol levels, controlling diabetes reduces the risk of complications for these diseases as well.

According to the CDC, treatment for diabetes can be categorized as follows¹⁰:

16% PATIENTS WITH DIABETES CONTROLLED WITH DIET & EXERCISE ALONE

58% PATIENTS WITH DIABETES CONTROLLED WITH ORAL MEDICATIONS ALONE

12% PATIENTS WITH DIABETES CONTROLLED WITH INSULIN ALONE

14% PATIENTS WITH DIABETES CONTROLLED WITH INSULIN & ORAL MEDICATIONS



26% OF MEMBERS WITH DIABETES ARE ON INSULIN THERAPY
AND SHOULD RECEIVE CLINICAL BENEFIT FROM
CHECKING THEIR BLOOD GLUCOSE REGULARLY.¹¹

ALMOST HALF OF PATIENTS WITH TYPE 2 DIABETES FAIL TO ACHIEVE A1C GOALS

Diabetes is a condition that can be managed with diet, exercise and medication. Why is it that almost half of all patients fail to achieve their A1C goals even when they are adherent to medications?¹²

One thing that is consistent among all patients with diabetes is that each person is unique and there is not a one size fits all treatment. For each person not meeting their A1C goals, there is a unique barrier or a combination of barriers, keeping them from achieving their clinical goals. It is important to understand what these barriers are and why they exist in order to develop an effective treatment plan. An individual conversation with a patient around their medication regimen, along with their lifestyle factors such as diet and exercise, is required to develop an effective strategy for treatment. In addition, the treatment plan needs to be monitored and adjusted over time as body composition changes and/or life events change.

According to the 2018 Tria Health book of business, for members with diabetes, roughly one-third (35%) of members with an identified drug therapy problem were taking too low of a dose of their medication and 32% needed an additional therapy. When looking at members who were not compliant:

- 23% could not afford their medication.
 - For 36% of patients, there was a more affordable drug available.
- 15% did not understand the instructions.
- 15% forgot to take their medication.
- 8% prefer not to take their medication.

These are all very different barriers for not being compliant and require individual conversations and education on the importance of being adherent. Having conversations with a medication expert, such as a pharmacist, is an effective form of treatment. A doctor of pharmacy can work on a professional level with a patient's physician for recommended changes to a medication regimen.

BARRIERS FOR COMPLIANCE



23%

COULD NOT AFFORD THEIR MEDICATION

For 36% of patients, there was a more affordable drug available



15%

DID NOT UNDERSTAND THE INSTRUCTIONS



15%

FORGET TO TAKE THEIR MEDICATION



6

HEALTHY EATING AND WEIGHT LOSS CAN PREVENT DIABETES AND HELP WITH ON-GOING MANAGEMENT OF DIABETES

For many, weight loss can lower blood sugar levels. According to the Mayo Clinic, a sustained weight loss of 7% or more of your initial weight seems to be ideal in making an impact on blood sugar levels.¹³

A ‘diabetes diet’ is based on eating regular intervals throughout the day to better use the insulin your body produces or gets through a medication. An individual diet plan based on individual health goals, tastes and lifestyles is important for sustainability.

Regular exercise is important for everyone, including those with diabetes. The American Diabetes Association recommends daily exercise, or not allowing more than two days to elapse between exercise sessions to enhance insulin action. Performing both aerobic and resistance exercise will provide for optimal glycemic and health outcomes. It is important with exercise, as it is with diet, to find things you like to do to increase sustainability.



TECHNOLOGY

CAN HELP MANAGE DIABETES



From the patient perspective...

There are a multitude of devices available in today's market to help patients manage their diabetes which include:

- Blood glucose meters – these are devices that help patients track blood glucose levels so patients can proactively manage changes in their glucose levels. In addition, readings can be shared with providers and other care givers to track trends and provide proactive professional support.
 - There are continuous glucose monitors (CGMs) that track glucose levels throughout the day and night, up to almost 300 readings per 24-hour period. These are especially beneficial for patients with Type 1 Diabetes and/or uncontrolled, insulin dependent type 2 patients.
 - Wireless/cellular glucose meters that allow patients to track their blood glucose on an 'as-needed' basis. These are especially beneficial for insulin dependent patients.
- Medication pens and pumps allow for easy administration of diabetes medication.
- Fitness tracking apps help manage diet and exercise. There are a multitude of fitness tracking apps that help patients manage their diet and exercise like LoseIt! or MyFitnessPal. In addition, many of the glucose meter apps have food and exercise tracking as well.

All of these device can be helpful in providing valuable data to the patient and the diabetes care team to improve overall care.

From a business perspective...

In general, healthcare is a data-rich industry and diabetes is no exception. Understanding the data and using technology to drive insights can help identify, analyze, report, and improve care for diabetes patients is extremely valuable. Technology can be used to identify plan members with diabetes for proactive outreach by analyzing claims and other health care data. Analysis of glucose readings and other clinical metrics can be used to drive intervention and overall treatment strategies. And, data measurement is used to report clinical and financial improvements. Technology can help support overall diabetes management and combined with one-on-one support from a professional can have a big impact on improving care.

PATIENT EXAMPLES

#1: DOSE TOO HIGH FOR A PATIENT WITH CONTROLLED DIABETES

A patient with diabetes, high blood pressure, high cholesterol, benign prostatic hyperplasia (BPH), essential tremor, and peripheral neuropathy had an appointment with Tria Health. The patient was taking Invokana, Metformin, and Glipizide for diabetes and reported excellent control as evidenced by an A1C level of 6.1%.

Tria discovered that the patient was experiencing frequent and symptomatic hypoglycemia (low blood sugar), primarily in the morning. Hypoglycemic episodes are concerning because they can lead to acute mental status changes and seizures. The patient was taking Glipizide twice daily, which was most likely causing these hypoglycemic episodes.

Based upon excellent control and problematic hypoglycemia, Tria recommended reducing the Glipizide dose to once daily. They physician agreed and upon follow-up, the patient was no longer experiencing hypoglycemia.

#2: DOSE OPTIMIZATION DROPPED A1C BY 1%

A patient with diabetes, coronary artery disease, depression, and benign prostatic hyperplasia(BPH) had an appointment with Tria Health. The patient was taking Metformin and Novolog mix insulin for diabetes, but they were not at goal with a A1C of 8.3%.

The patient was not on the optimal dose of metformin. The patient was concerned about increasing the dose due to some gastro intestinal (GI) side effects they were experiencing. This was definitely the preferred treatment option as opposed to escalating their insulin dose, which is more costly and leads to weight gain.

Tria informed the patient that an extended release formulation of metformin would have fewer GI side effects. Tria recommended the patient switch to metformin ER at a higher dose. The physician agreed with Tria's recommendation and upon follow-up, the patient was taking and tolerating metformin ER and their A1C had dropped by 1%.

SUMMARY

DIABETES IS A DOUBLE THREAT THAT EMPLOYERS CANNOT IGNORE

In summary, diabetes is a double threat that employers cannot ignore. It is a double threat because of its high prevalence and high cost. Almost 1 in 10 Americans have diabetes. The average cost for a person with diabetes is 2.3 times more expensive than a person without diabetes.

The majority of patients with diabetes also have other conditions (92%), which impacts overall condition management. Being able to treat the entire patient, not just the disease state, is critical.

While technology can certainly help with diabetes management by using data to identify at risk patients; capture blood glucose levels; determine timing and types of interventions; and conduct pre/post care analysis; a personal approach is required to understand the individual barriers required to get patients to their desired A1C levels.

Over half of all diabetes patients don't meet A1C levels, even if they are adherent to their medications. There are several reasons as outlined in this paper why patients are not meeting their desired A1C levels. Understanding what these are and having a professional who is a medication expert, with certified diabetes training, can have a significant impact on improving health outcomes and A1C levels.

According to the Tria Health book of business, a high-tech and high-touch intervention will substantially reduce overall health care costs related specifically to diabetes (poor health outcomes) by \$2,328. In 2018, Tria Health was able to reduce A1C levels by 1.3 percentage points for uncontrolled patients with diabetes proving that an appropriately timed personal intervention will make a positive impact on the bottom line for employers.

SOURCES

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5. Tria Health 2018 Health Care Data Partners analysis on Tria Health's book of business. Includes self-insured employers with pharmacy and medical claims for 2017 and 2018. Base sample includes members 'identified' by Tria Health as high-risk, high cost. At a high level, these members have a chronic or specialty condition and take four or more medications. The 'identified' members are split into those that engaged with Tria Health and those that did not engage
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