All About: Diabetes in Long-Term Care

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In the U.S. there is a disproportionate number of diabetes diagnoses affecting the older generation, with approximately 30% of the overall population being 65 years or older while nearly 4% impacted are young adults. Of those over 65, 25-34% reside in long-term care (LTC) facilities. The rise in diabetes is causing a significant increase in healthcare demands and cost the U.S. nearly $413 billion in 2022. Using PointClickCare Life Sciences data, covering over 70% of the U.S. LTC market, the prevalence of diabetes is currently 36%.

The high number of diabetes in the LTC population correlates to age-related physiological changes. Diabetes increases the risk for several comorbidities, increasing morbidity and mortality, these include cardiovascular and microvascular complications. Due to the severity of developed comorbidities and complications, this population tends to be excluded in randomized clinical trials. The use of LTC Electronic Health Record (EHR) data is an important consideration to improve trial representation as it possesses the range and potential to improve standard of care as well as improve efficiency in monitoring and management of this continuing epidemic.

Below we outlined the demographic and prevalence of Type 2 Diabetes Mellitus (T2DM) within LTC and skilled nursing facilities (SNF).

Between 2017 and 2022, 3,081,962 residents of PointClickCare LTC facilities were diagnosed with type 2 diabetes (as depicted by ICD10 codes). Of which, 57% of diagnosed residents identified as white, while 14% and 6% identified as Black and Hispanic or Latino respectively. The average age of residents diagnosed with T2DM is 74.

Of the diagnosed residents in the PointClickCare databases, 1,641,151 of residents were female. This value was significantly higher than the proportion of male diagnosed patients (p>0.05). So, why are female residents over the age of 65 more prone to T2DM?

Age At Onset	Residents N	Residents %
<50	80,354	2.6%
50-69	899,626	29.2%
70-89	1,842,229	59.8%
90+	259,753	8.4%
Average Age at Onset: 74		

Within LTC, the shift towards a female bias is due to the natural physiology of aging regarding sex hormones. Studies indicate this is due to the lack of estrogen and the increasing insulin resistance which creates a strong likelihood of to obesity. This phenomenon potentially links the physiological transition from fertile life to menopause. There's a notable correlation in the transition of body shape regarding increase in abdominal fat and perivisceral adiposity. Studies indicate that obesity is correlated to cardiovascular disease, metabolic disease, steatosis, and hepatic fibrosis.

Cardiovascular risk over the years, a cardiovascular comorbidity with T2DM diagnosis, can be detrimental to to an individual's overall well-being and be potentially deadly. Monitoring the post-menopausal female population, especially in LTC, is critical for identifying and managing prediabetes and diabetes patients.

Number of Diagnoses Occurring within the Facilities

	Onset Date During a Facility Visit	Onset Date NOT During a Facility Visit
Residents (N)	2,942,603	139,359
Resident %	95%	5%

In the U.S., there is an estimated 50% of adults aged 65 or older that meet the criteria of prediabetes. There's a knowledge gap about the progressive implications of hyperglycemia, prediabetes, and diagnosed diabetes in this age group. Without proper representation and awareness of the presentation and progression of these diseases in the elderly, they are poorly characterized in studies.

## Presentation and Patient Characteristics

Most common symptoms:

Prediabetes
- Overweight
- Over 45 years of age
- Physically active less than 3 times a week
- Race/Ethnicity

Type 2 Diabetes
- Urinating more often, often occurring during the night
- Increased thirst/ hunger
- Loss of weight rapidly
- Blurry Vision
- Tingling sensations
- Lethargic
- Infections and sores that are unresponsive/ take an abnormal amount of time to heal
- Hypoglycemic/hyperglycemic events

Most Common Comorbidities
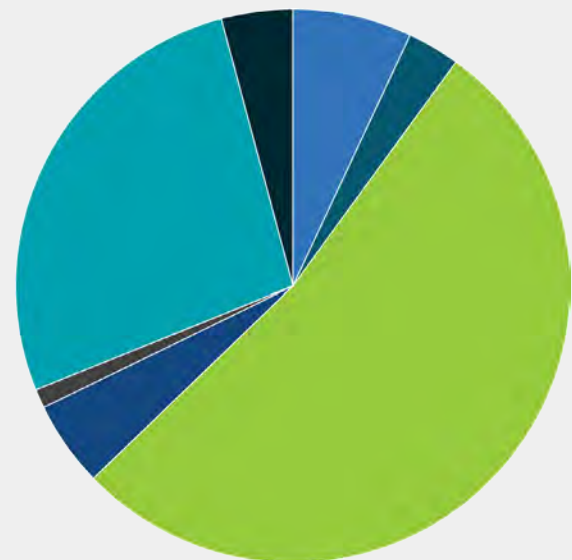
- Stroke
- MI
- Hypertension
- DKD
- NAFLD
- MDD
- Amputation

Diagnosis and Management

Type 2 diabetes is typically diagnosed using the glycated hemoglobin (A1C) test. This blood test indicates the individual's average blood sugar level over several months (typically 2 - 3 months). Results of 5.7% - 6.4% are diagnosed as prediabetes, any result over 6.5% is considered a positive diagnosis for diabetes. Similarly, either a fasting blood sugar test (FG – fasting glucose levels) or oral glucose tolerance test may be taken to produce a diagnosis. The results of a fasting blood sugar test must be over 126 mg/dL to indicate diabetes. For a diagnosis using an oral glucose tolerance test, the individual must have a reading of 200 mg/dL.

Screenings should occur in all adults aged 35 years or older for those who have had prediabetes, are overweight or obese, have had gestational diabetes, and have a history of Type 2 diabetes.

A. Glycated Hemoglobin
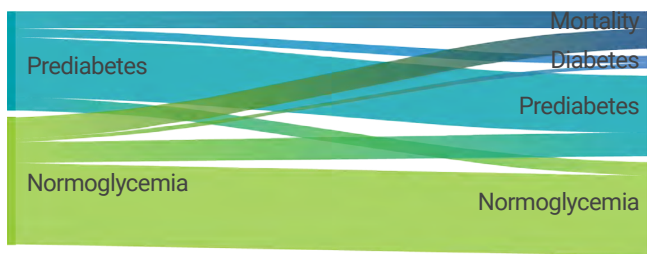
B. Impaired FG

Figure taken from Rooney et al, 2021.

BS_Range	Residents with a Measure	Avg Measures Per Resident (>=1 Measure)	Avg Measurement mgdl	Median Measurement mgdl	AvgSD	Min	Max
Low <70 mg/dl	4,047	4	35.249088	21.96	35.9547202	1.08	69.992298
Normal 70 to 99	39,183	49	92.741271	94.883994	18.49361625	70.02	99.99999
Pre 100 to 125 mg/dl	303,234	132	115.247797	116.253	24.00804018	100.000278	124.999992
High >125 mg/dl	1,892,823	380	179.282721	172.019988	52.4330963	125.000226	399.06
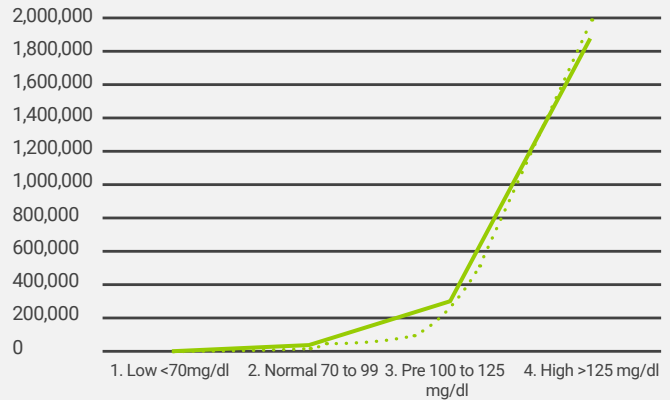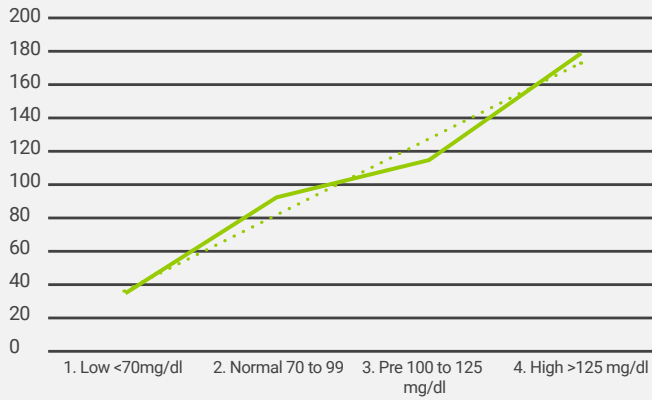
Drug Class	Branded Name	Drug Class	Branded Name
Biguanides	Metformin	GLP-1	Victoza
Sulfonylureas	Glucotrol	GLP-1	Ozempic
Sulfonylureas	Amaryl	GLP-1	Trulicity
Insulins	Lantus	DPP-4	Januvia
Insulins	Humalog	DPP-4	Onglyza
TZD	Actos	Meglitinides	Prandin
TZD	Avandia	Meglitinides	Starlix
Alpha-Glucosidase Inhibitors	Precose	Amylin Analogue	Symlin
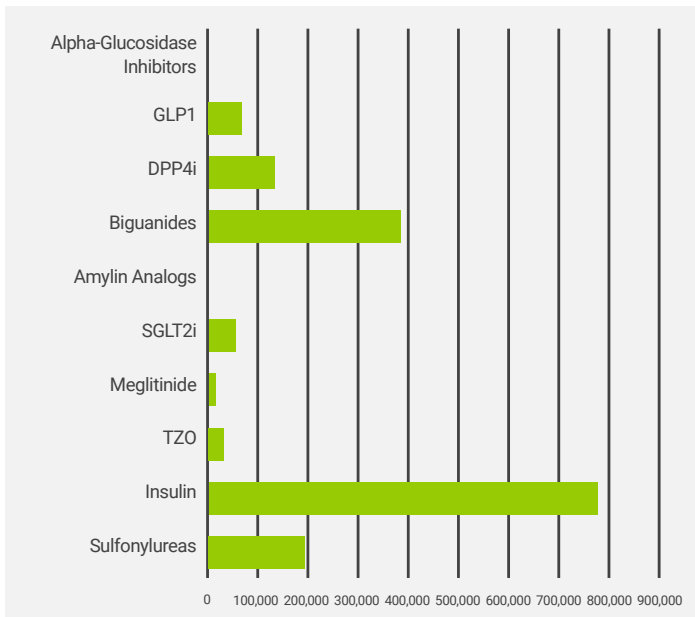
Adaptation of Therapies in PointClickCare Facilities

PointClickCare healthcare platforms represent 70% of long-term care patients with daily data flowing through our system. We leverage this anonymized data to help life sciences brands understand this aging population. With more than 30 terabytes of data collected over the last 5 years alone, our data tracks trends over longer periods of time.

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