

# AI API FOR DIABETES USE CASES



**nubentos**  
the api marketplace for health



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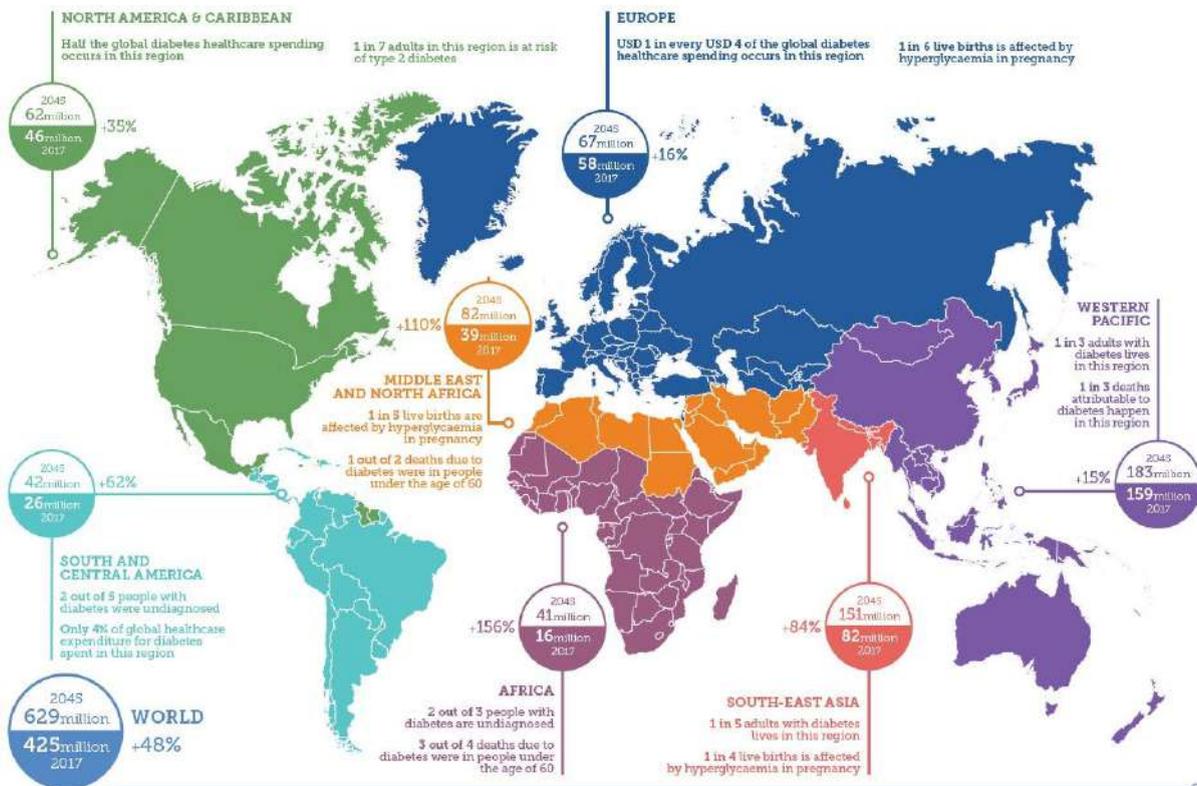
<b>DIABETES IN THE WORLD</b>	<b>2</b>
<b>AI FOR DIABETES AVAILABLE FOR ANYONE</b>	<b>4</b>
AI FOR DIABETES	4
AVAILABLE FOR ANYONE	4
<b>USE CASES</b>	<b>7</b>
PATIENT AUTONOMY	7
DIABETES RESEARCH	9
INSULIN BOLUS	10
ADDED VALUE IN APPLICATIONS FOR THE PATIENT	10
<b>WHAT SHOULD I DO TO USE THIS API?</b>	<b>13</b>



## DIABETES IN THE WORLD

Diabetes is one of the most widespread chronic diseases in the world. And the trend also points to a sharp increase in cases in the coming decades, in all regions.

According to the International Diabetes Federation, in 2017, 425 million people were diagnosed worldwide. By 2045 it is estimated that there will be 629 million cases, which represents an increase of 48%.



Source: IDF

Beyond the population extension that suffers from the disease, some data are especially impressive:



- in 2017 diabetes caused 4 million deaths
- more than 1 million children lived with type 1 diabetes
- 79% of diabetes cases occur in low-middle development regions,
- diabetes-related health expenditure in 2017 amounted to 727 billion dollars, 12% of total adult health expenditure.

The imbalance between the cases diagnosed in the developed world and the regions of less developed economies is even greater if we analyze the estimated evolution of the disease by regions.

Thus, while in North America an increase of + 35% is estimated for 2045, in Europe only + 16% and in the Western Pacific of + 15%, in the rest of the world the outlook is bleak:

- Central and South America: It is estimated that by 2045 the cases will have increased by + 62%
- Southeast Asia: + 84%
- Near East and North Africa: + 110%
- Africa: + 156%

This brief summary of what diabetes represents in the health sector in the world explains the enormous interest of the medical, scientific and technological community in finding advances in prevention services and improving the quality of life of diabetic patients.

In 2045 it is estimated that cases of **diabetes** in the world will have increased by **48%**.



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It is not only necessary to find better tools, but also new models that allow these improvements to reach the entire world population equally. Otherwise, the current imbalance will only grow until it becomes unsustainable in a few decades.

## AI FOR DIABETES AVAILABLE FOR ANYONE

### AI FOR DIABETES

Medicsen is working to apply Artificial Intelligence to the treatment of chronic diseases, helping to improve the patient's quality of life.

Their first challenge focuses on diabetes, and as a result of their work they have developed a non-invasive artificial pancreas, composed of a device for non-invasive medication administration, and **predictive learning software**.

The developed algorithm is able to predict the patient's glucose values 1 hour in advance. To do this, it uses information that it receives from the user, such as historical values, eating habits and medication.

### AVAILABLE FOR ANYONE

Nubentos offers the healthcare ecosystem its Marketplace platform for Digital Health, which allows the integration of **any Digital Health solution in any healthcare software** of any actor in the ecosystem.



It is necessary to find new models that allow these improvements to reach equally the entire world population

In addition to the purely technological solution, Nubentos introduces in the sector an innovative model based on the **API Economy**, which allows solutions to be available to any budget.

Based on pay per use, it allows costs to be auto-scaled, that is, to automatically adjust to the actual use in each usage scenario.

The model introduced by Nubentos brings significant benefits to the entire value chain involved:

- ★ The companies that, like Medicsen, offer advanced solutions in Digital Health, have in Nubentos a free distribution channel that allows them to multiply their users and income, also adding functionalities and benefits to its consumers that allow them to focus solely on continuing to innovate and improve their services.
- ★ IT companies that develop software for Health and Wellness, have greater access to advanced Digital Health solutions, such as the AI API for Diabetes by Medicsen, because they can choose between different consumption plans, with fees based on pay per use and adapted to each tier, and integrate them into their software products at no cost.
- ★ All health institutions, regardless of their size and budget, as well as a greater number of citizens on their mobile devices, can use the new advances in Digital Health in their usual software tools.



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With this document, Nubentos and Medicsen want to contribute their grain of sand to the improvement of the quality of life of the diabetic patient, joining the innovation that involves the application of Artificial Intelligence to the management of chronic diseases, with a new integration model of software that allows that innovation to be available to everyone.



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## USE CASES

Below we compile some of the main use cases of the AI API for Diabetes by Medicsen. Surely, there are more applications of its solution, and Medicsen and Nubentos teams encourage the health software development community to innovate with new applications of its algorithm, beyond those presented here.

### PATIENT AUTONOMY

Usually, health care revolves around reactive processes. The patient shows certain symptoms, diagnostic tests offer certain values, the doctor establishes a diagnosis.

From these moments, the assistance actions and the corresponding treatments begin.

In diabetes, as in other chronic diseases, the patient's habits and routines are very important. In this type of diseases it is essential to put in the patient the best possible means so that their everyday with the disease have the best possible quality of life.

But with a reactive care model, the patient has little capacity to ensure that their habits, routines, or the circumstances they face each day, will not affect the evolution of their disease.



Currently there are devices and software for monitoring the diabetic patient, which allow to maintain a better control of their evolution and ensure a better quality of care.

With the AI API for Diabetes by Medicsen, these monitoring systems can incorporate the ability to predict the glucose curve that the patient will have 1 hour in advance.

Diabetic patients can **know** what their state in the near future will be more accurately, allowing them to **adapt** to future changes more precisely.

This ability allows diabetic patients to know what their state will be in the near future. more precisely, allowing them to adapt to future changes more precisely.

As a consequence, the evolution of blood glucose curves can be controlled by the patient himself, or by means of alerts managed from the healthcare team.

In this way, the healthcare of the diabetic patient becomes **preventive**. The glucose curve evolves within the optimal ranges for longer. The patient has **greater control of the disease**, and complications resulting from poor diabetes control in the short and long term are reduced.



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## DIABETES RESEARCH

There is a very intense research activity around diabetes. The better the factors that influence all the parameters that affect the disease are known, the better the treatments and recommendations to be applied in the everyday of the diabetic patient can be adjusted.



By incorporating the AI API for Diabetes by Medicsen into the research software used by these institutions, a researcher can learn more precisely how certain changes in the diet or in the medication administered cause variations in the glucose curve. The variations are shown both in magnitude of the variation, as its concrete value, and in the different times in which these variations take place.



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With this capacity, research will achieve optimal results in less time, **accelerating the quality of care** around diabetes globally.

## INSULIN BOLUS

One of the most important lines of research revolves around insulin bolus calculation. Research is being done to develop algorithms for the control and calculation of the optimal doses that should be administered to diabetic patients.

The AI API for Diabetes by Medicsen, capable of predicting the patient's future glucose values for the next hour, can be of great help in analyzing and optimizing new insulin bolus calculation algorithms.

Researchers or companies that are developing this type of algorithm can use the API by Medicsen to learn how the medication they deem necessary to administer can affect the patient's glucose curve in the short term.

In this way, they will be able to **validate with greater precision** the operation of their algorithms, in a totally controlled and very efficient way.

## ADDED VALUE IN APPLICATIONS FOR THE PATIENT

The AI API for Diabetes by Medicsen can be a good complement to applications or support systems for patients with diabetes.



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Within the huge variety of Apps that are developed for the chronically ill in general, and diabetic in particular, incorporating the ability to predict the evolution of the user's glucose 1 hour in advance, allows the App to greatly customize the services offered to its user.



Instead of generic recommendations, based on clinical literature, which lose value over time, an App that incorporates the ability to anticipate this information to the user, is also capable of giving **much more precise and user-valued recommendations**.

The content of the App as a whole can be adapted to each patient depending on their status.



How would you rate an App that will advise you that you will have a rise or fall in glucose and tell you what you can do to avoid it?

For example, you can **customize the advice**, recommendations and content shown to users of these applications based on their status in the near future, providing them with more value, greater knowledge of their disease, helping them learn how to react to potential situations of risk, as well as maintaining greater control of your disease.

How would you rate an App that will advise you that you will have a rise or fall in glucose and tell you what you can do to avoid it?

In this way, the user will find constant help in the App, which will result in a greater recurrence in the use of the App and its future updates.



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## WHAT SHOULD I DO TO USE THIS API?

Accessing an API published in the Nubentos API Store and integrating it into your software products could not be easier:

- 1) **Access** the API by Medicsen from the [Nubentos Public API Store](#), or [directly from this link](#).
- 2) **Sign up** for the Nubentos API Store, it's **free**. You will create a username "user".
- 3) Once identified with your new user **using "user@medicsen.com"** you can access the API again in the Medicsen Store and you will have the **subscription** options available for the API by Medicsen.
- 4) Once you subscribe to the plan that best suits your needs and budget, you must generate a **token** for the Sandbox environment and you can start **testing the API** in our Integrated Test Console, at no cost and without writing a single line of code.
- 5) When you have learned to use the API, understand its operation and have verified that it meets your needs, you can download one of the **10 available SDKs** to quickly integrate it into your software.

Remember that you will not incur any cost as long as it is not used by your end users, and from that moment on, the cost will be determined by the subscription plan you chose and by the use made by your users.

You can establish throttling policies to avoid misuse that can generate you over costs. You have analytics to monitor the use of your subscriptions by your users and keep your costs under control. You can always change subscription plans and use several different subscriptions to the same API (different tokens).



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In Nubentos we work to connect the best innovations in Digital Health with the Healthcare Software development community.

**We want to democratize Digital Health.**

Our API Marketplace platform is available to the Health Ecosystem at no cost.

Companies that offer services or APIs for Health, can publish them in Nubentos to reach as many users as possible, be they healthcare professionals or citizens.

The Healthcare Software development community finds in Nubentos the best APIs in Digital Health and the necessary tools to easily integrate them into their software products.

Find out at [www.nubentos.com](http://www.nubentos.com).

