



InSyBio

Intelligent Systems Biology

User Manual

www.insybio.com

InSyBio Precision Chronic Pain Treatment Tool: a first-of-its-kind tool for personalizing treatment of chronic pain patients

April 2021

Insybio Pain Tool v1.1

InSyBio Precision Chronic Pain Treatment Tool

Introduction

InSyBio Precision Chronic Pain Treatment Tool is a first-of-its-kind tool that is able to stratify chronic pain patients into individuals who will benefit from topical analgesics treatment and select the most suitable non-opioid treatment formulation for them using as input a combination of demographics, clinical characteristics and other responses to a simple questionnaire.

The first version of this tool is available for a free trial usage by clinicians treating Chronic pain patients (get it from here: <https://pain.insybio.com/>) offering them the following features:

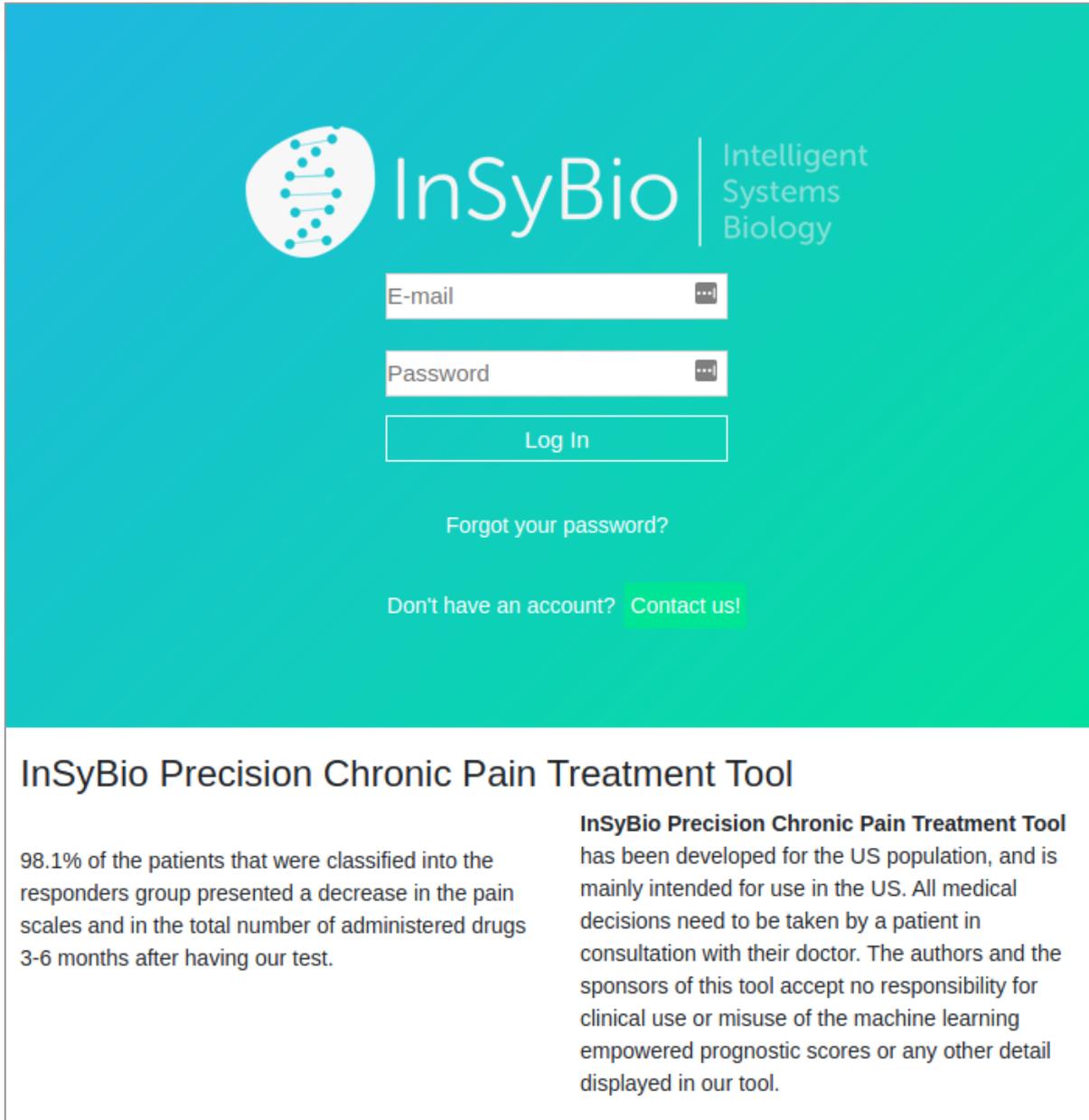
- Evaluation of chronic pain situation of patients through the completion of a user-friendly web form
- Monitoring the progress of chronic pain patients over the time (trends, graphical representation of their clinical and demographics characteristics etc.)
- Suggesting suitable patients for non-opioid treatments
- Suggesting the best performing non-opioid treatment among 4 different formulations.

98.1% of the patients that were classified into the responders group presented a decrease in the pain scales and in the total number of administered drugs 3-6 months after having our test.

The available functionalities of the tool include an overview of My Patients with their Tests, New Patient addition, New Test addition and viewing Test results.

Logging in

In the login page at pain.insybio.com, you enter your email and your password and press the “Log In” button.



InSyBio Intelligent Systems Biology

E-mail

Password

Log In

[Forgot your password?](#)

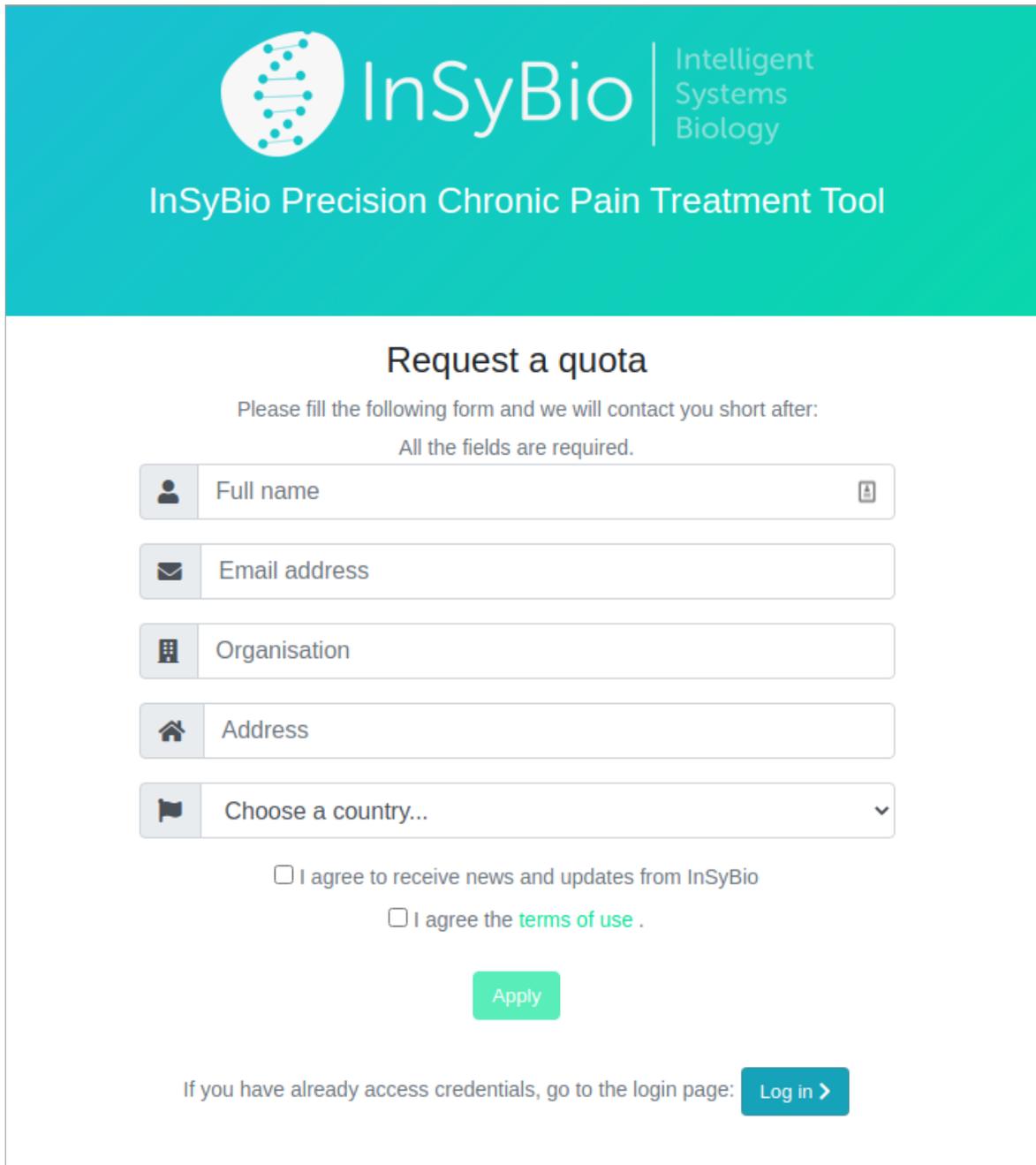
Don't have an account? [Contact us!](#)

InSyBio Precision Chronic Pain Treatment Tool

98.1% of the patients that were classified into the responders group presented a decrease in the pain scales and in the total number of administered drugs 3-6 months after having our test.

InSyBio Precision Chronic Pain Treatment Tool has been developed for the US population, and is mainly intended for use in the US. All medical decisions need to be taken by a patient in consultation with their doctor. The authors and the sponsors of this tool accept no responsibility for clinical use or misuse of the machine learning empowered prognostic scores or any other detail displayed in our tool.

If you don't have an account yet, you should click the respective button "Contact us!". This redirects you to a page where a registration form should be filled out.



The screenshot shows the InSyBio logo and tagline 'Intelligent Systems Biology' at the top. Below it is the title 'InSyBio Precision Chronic Pain Treatment Tool'. The main heading is 'Request a quota', followed by the instruction 'Please fill the following form and we will contact you short after: All the fields are required.' The form consists of five input fields: 'Full name' (with a person icon), 'Email address' (with an envelope icon), 'Organisation' (with a building icon), 'Address' (with a house icon), and 'Choose a country...' (with a flag icon and a dropdown arrow). Below the fields are two checkboxes: 'I agree to receive news and updates from InSyBio' and 'I agree the terms of use'. A green 'Apply' button is centered below the checkboxes. At the bottom, there is a link 'If you have already access credentials, go to the login page:' followed by a blue 'Log in >' button.

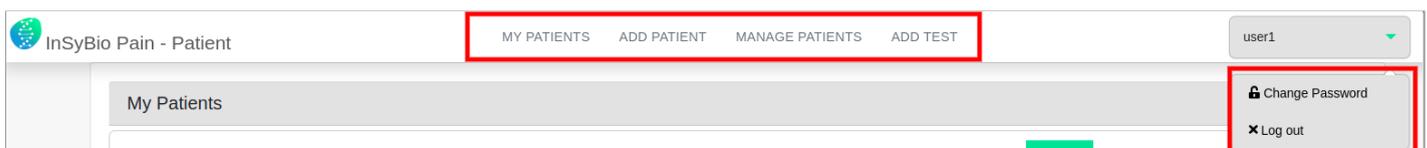
In case you have forgotten your password, you can click the respective link. In the page you will be redirected to, you have to enter your email. After that a link where you can update the password will be sent to you.

Forgot Password

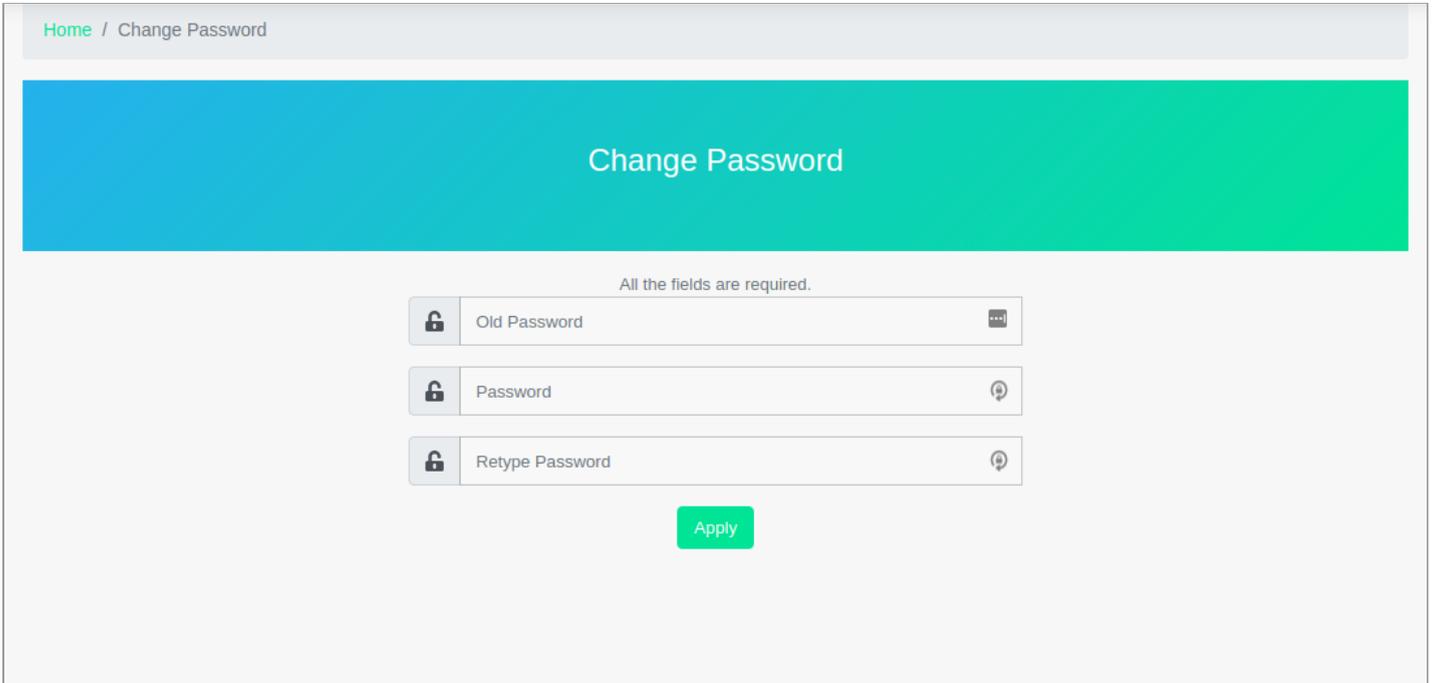
Please fill your email address and we will contact you short after:

Home Page

After logging in, you are redirected to the home page - the patient index view. The patient index view consists of three parts - My Patients, Create new Patient and Manage Patients part. In these parts you are able to view your patients with their submitted tests (baselines and follow ups), add a new patient and manage your registered patients (delete and update patient). In the top of the home page you can see a navigation bar that gives you the opportunity to go to every part of this page (My Patients, Add Patient, Manage Patients or Add Test) or under your name change your password or log out.



In case you want to change your password, you can click the respective link on the user dropdown menu. In the page you will be redirected to, you have to enter your old password and type and retype the new password in the relevant fields. After that you can sign in with your new credentials.



The screenshot shows a web interface for changing a password. At the top left, there is a breadcrumb trail: "Home / Change Password". Below this is a large teal header with the text "Change Password". Underneath the header, there is a message: "All the fields are required." followed by three input fields, each with a lock icon on the left and a visibility icon on the right:

- Old Password
- Password
- Retype Password

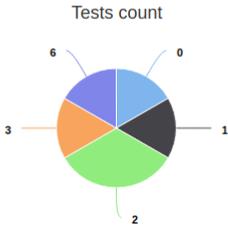
Below the input fields is a green "Apply" button.

My Patients

In the My Patients part you are able to view your patients with their submitted tests (baselines and follow ups). This part of the view looks like the following:

My Patients

Tests count



Filters Active - 0 Clear All

Total tests ⌵ × Aa ↕ # ↕

0	1
1	1
2	2
3	1
6	1

+ Add test	Patient Code	Date of birth	Gender	Comments	Total tests	Progress	Baseline	Followup 1	Followup 2	Followup 3	Followup 4	Followup 5
+ Add	patient18	2021-04-06	Female	Office job	6	View progress	Baseline ⌵	Followup 1 ⌵	Followup 2 ⌵	Followup 3 ⌵	Followup 4 ⌵	Followup 5 ⌵
+ Add	patient13	2021-04-06	Male	Athlete	3	View progress	Baseline ⌵	Followup 1 ⌵	Followup 2 ⌵	-	-	-
+ Add	patient14	2021-04-06	Male	Office job	2	View progress	Baseline ⌵	Followup 1 ⌵	-	-	-	-
+ Add	patient15	2021-04-06	Male	Manual job	2	View progress	Baseline ⌵	Followup 1 ⌵	-	-	-	-
+ Add	patient16	2021-04-06	Male	Athlete	1	View progress	Baseline ⌵	-	-	-	-	-
+ Add	patient10	2021-04-06	Female	Manual job	0	View progress	-	-	-	-	-	-

Showing 1 to 6 of 6 entries
Previous 1 Next

The above table shows all the basic information of a patient (Patient Code, Date of Birth, Gender, Comments) including the tests information (Total tests and the results of the completed tests) and the progress of the patient’s pain severity, interference, pain related complaints and drugs used through time. The first test of a patient is the Baseline test and every new one is called Followup 1, Followup 2 etc. In the field “Baseline” and “Followup 1, 2 etc” you are able to click the given link in order to view the results of each test. The green color on the test link indicates a reduction in patient’s pain severity, interference, pain related complaints and drugs used from the previous to the next test and the red color indicates an increase of them. By clicking the delete icon next to the test’s link you are able to delete the selected test. In the first field “Add test” you can create a new test for the patient.

Above the table there is a pie chart and a filter panel. By clicking at one or more lines of the filter panel you are able to filter the patients table according to the number of their submitted tests. For example, clicking on the line where Total tests is 0, you are able to see only those patients for whom you have not yet submitted tests. The pie chart shows the tests count of the patients presented in the table.

Create new Patient

In the create new patient form you are able to fill out the basic information about a patient. A patient code, the date of birth, the gender and optionally some worth mentioning comments.

Create new Patient

Fields with * are required.

Patientcode * Date of birth Gender Comments

 03/01/2021 Male Female

After creating a patient you can see the patient's details in the table "My Patients" and add his first test (Baseline).

Manage Patients

In the manage patients part of the home page you are able to update the information of a patient or delete a registered patient including his tests from the column Actions of the table. This part of the view looks like the following:

Manage Patients						
Patient Code	Date of birth	Gender	Comments	Total tests	Actions	
patient10	2021-04-06	Female	Manual job	0	 	
patient13	2021-04-06	Male	Athlete	3	 	
patient14	2021-04-06	Male	Office job	2	 	
patient15	2021-04-06	Male	Manual job	2	 	
patient16	2021-04-06	Male	Athlete	1	 	
patient18	2021-04-06	Female	Office job	6	 	

Showing 1 to 6 of 6 entries

Previous 1 Next

After deleting a patient there are also no more the patient's details and his tests in the table "My Patients".

Create new Test

This page allows you to create a new test for a patient. The first test of a patient is the Baseline test and every new one is called Followup 1, Followup 2 etc. By entering this view you can see a simple questionnaire that must be filled out in order to identify if a non-opioid treatment is suitable for this patient and which one of the four supported formulations.

At first you should answer the questionnaire, then press the submit button, wait a minute without pressing anything and finally the results will appear on screen.

The test consists of 4 parts. The "Date of Survey", the "Primary Complaint/Diagnosis", "Severity/ Interference" and "Current Medication Usage".

Date of survey

03/01/2021



Primary complaint/ Diagnosis

(Check all that apply)

Arthritis

- Hands Feet Hips Knees Neck Shoulders Back Other

**Neuropathy or
Radiculopathy
(Radiating pain)**

- Hands Feet Neck Back Sciatica Other

**Myofascial/
Musculoskeletal
Pain or Spasm**

- Neck Shoulder Back Hips Other

Tendinitis

- Shoulder Elbow Knee Wrist Hip Other

Other



Severity/ Interference

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

Yes No

2. Select the areas where you feel pain.

Ankle Elbow Foot Hand Head Hip Neck Shoulder Knee Upper Arm
 Upper Leg Wrist Lower Arm Lower Leg Back

3. Please rate your pain by selecting the one number that best describes your pain at its worst in the last 24 hours.



4. Please rate your pain by selecting the one number that best describes your pain at its least in the last 24 hours.



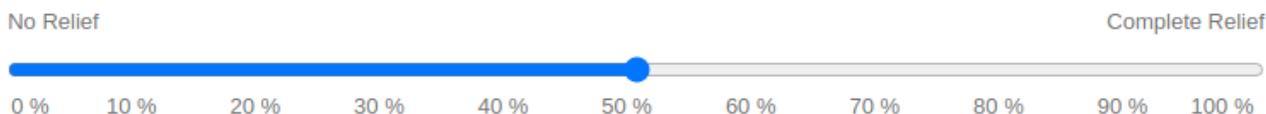
5. Please rate your pain by selecting the one number that tells how much pain you have on the average.



6. Please rate your pain by selecting the one number that tells how much pain you have right now.



7. In the last 24 hours, how much pain relief have treatments or medications provided? Please select the one percentage that most shows how much relief you have received.



8. Select the one number that describes how, during the past 24 hours, pain has interfered with your:

A. General Activity

Does not Interfere

Completely Interferes



B. Mood

Does not Interfere

Completely Interferes



C. Walking Ability

Does not Interfere

Completely Interferes



D. Normal Work (includes both work outside the home and housework)

Does not Interfere

Completely Interferes



E. Relations with other people

Does not Interfere

Completely Interferes



F. Sleep

Does not Interfere

Completely Interferes



G. Enjoyment of life

Does not Interfere

Completely Interferes



Current medication usage

Yes None

(Check all that apply)

1. Over-the-Counter (OTC) Pain Medication

- Advil®, Motrin® (ibuprofen)
- ALEVE® (naproxen)
- Aspirin (acetylsalicylic acid)
- Tylenol® (acetaminophen)
- Other

If you have indicated any medications taken above - What is dose and how often per day?

- 1 x day
- 2 x day
- 3 x day
- More than 3 x day
- As Needed

Dosage

2. Anti-Inflammatory (Prescription)

- | | | |
|----------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|
| <input type="checkbox"/> Anaprox (naproxen sodium) | <input type="checkbox"/> Feldene (piroxicam) | <input type="checkbox"/> Toradol (ketorolac tromethamine) |
| <input type="checkbox"/> Celebrex (celecoxib) | <input type="checkbox"/> Indocin (indomethacin) | <input type="checkbox"/> Vimovo (naproxen/ esomeprazole) |
| <input type="checkbox"/> Clinoril (sulindac) | <input type="checkbox"/> Lodine (etodolac) | <input type="checkbox"/> Voltaren (diclofenac) |
| <input type="checkbox"/> Daypro (oxaprozin) | <input type="checkbox"/> Mobic (meloxicam) | <input type="checkbox"/> Other |
| <input type="checkbox"/> Disalcid (salsalate) | <input type="checkbox"/> Naprosyn (naproxen) | |
| <input type="checkbox"/> Dolobid (diflunisal) | <input type="checkbox"/> Relafen (nabumetone) | |

If you have indicated any medications taken above - What is dose and how often per day?

- 1 x day
- 2 x day
- 3 x day
- More than 3 x day
- As Needed

Dosage

3. Narcotic

- | | | |
|-------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Avinza®, Kadian® (morphine) | <input type="checkbox"/> Duragesic®, Fentora®, Actiq® (fentanyl) | <input type="checkbox"/> Oxycontin®, Oxyfast®, Percocet®, Roxicodone® (oxycodone and acetaminophen) |
| <input type="checkbox"/> Demerol (meperidine) | <input type="checkbox"/> Lorcet®, Lortab®, Norco®, Vicodin® (hydrocodone) | <input type="checkbox"/> Other: Neurontin® (gabapentin) Lyrica® (pregabalin) Ultram® |
| <input type="checkbox"/> Dilaudid®, Exalgo® (hydromorphone) | <input type="checkbox"/> Opana® (oxymorphone) | |

If you have indicated any medications taken above - What is dose and how often per day?

- 1 x day
- 2 x day
- 3 x day
- More than 3 x day
- As Needed

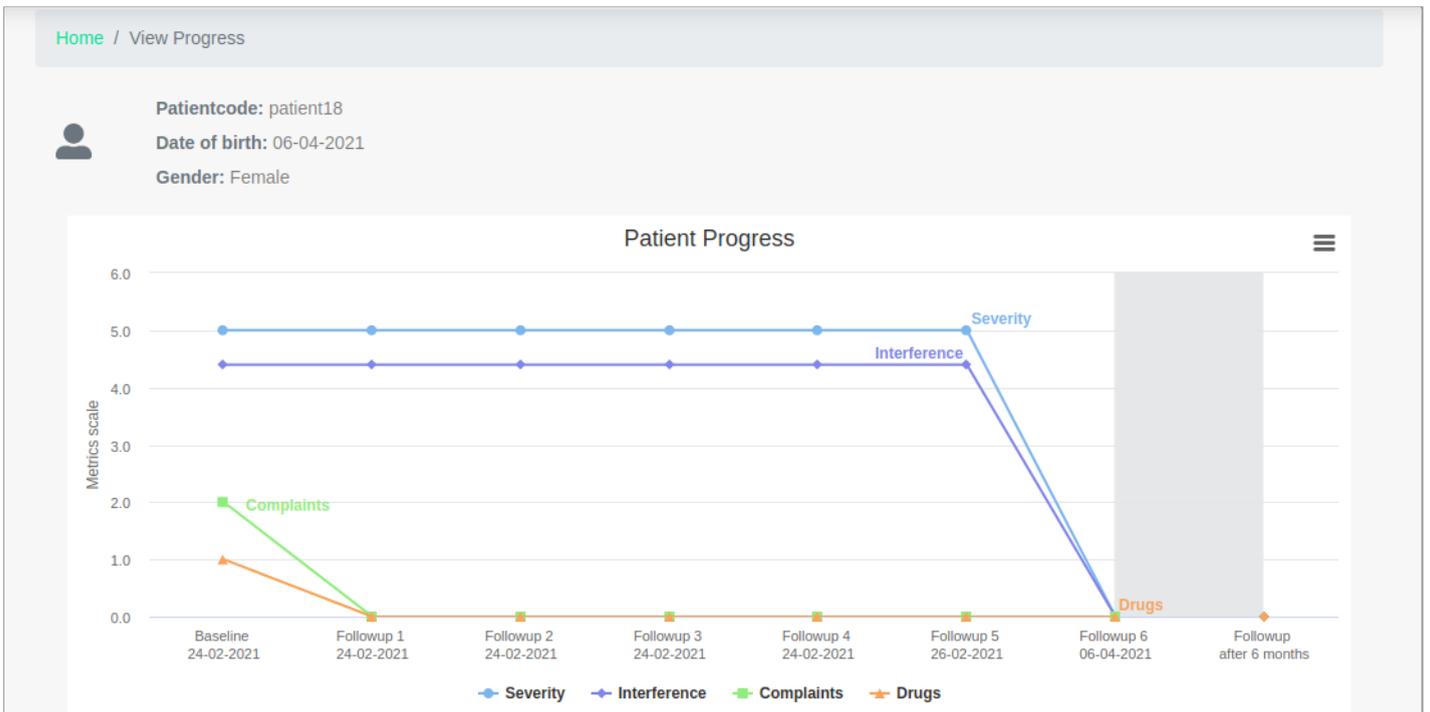
Dosage

When you answer the questions for your patient, you submit the test and wait a few seconds to be redirected to a result page with all the detailed information, graphs and predictions about the respective patient.

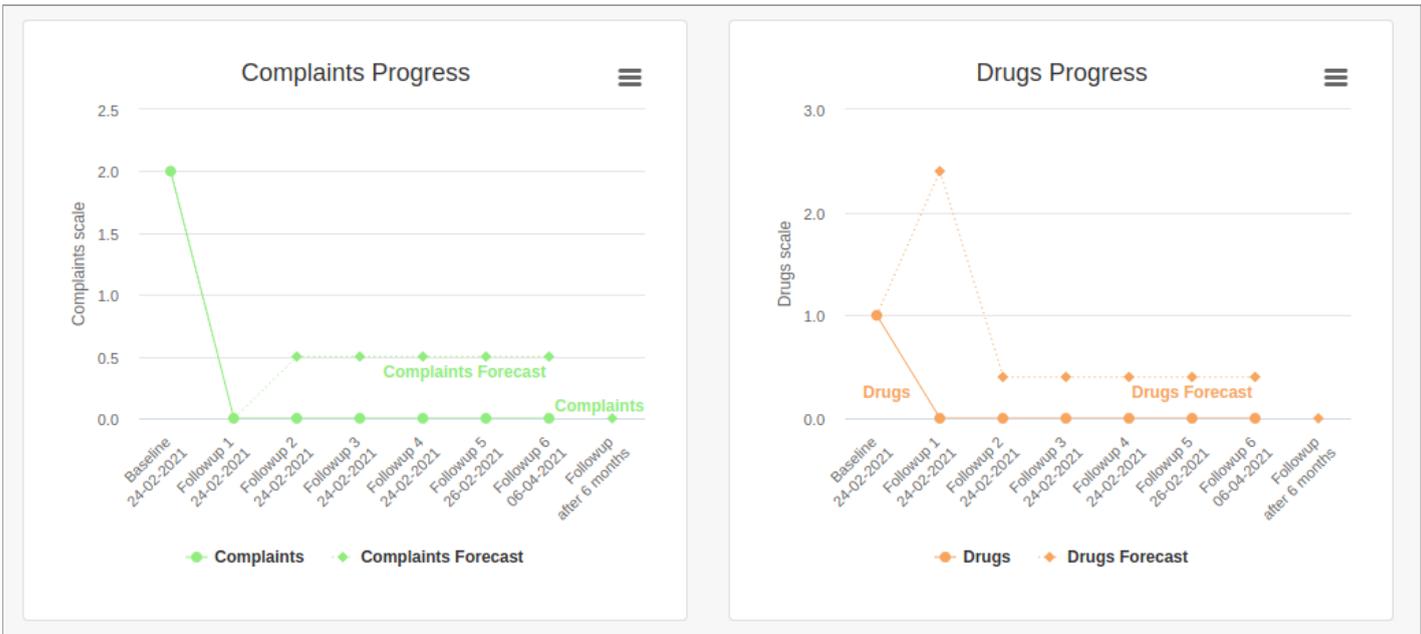
View Progress

In the view progress page you can see a data visualization of the results of the completed tests in comparison with the results of the forecasting algorithm in the patient's pain severity, interference, pain related complaints and drugs used.

At first you can see the Patient Progress chart with the results of all the patient's metrics in the completed tests (Baseline, Followup 1 etc). Every metric has its own line that gives you its progress through time. The last value of x axis shows you the value that is forecasted from the algorithm in a Followup after 6 months.



Except from the total metric chart you can see a graph for every metric in comparison with the forecasted values.

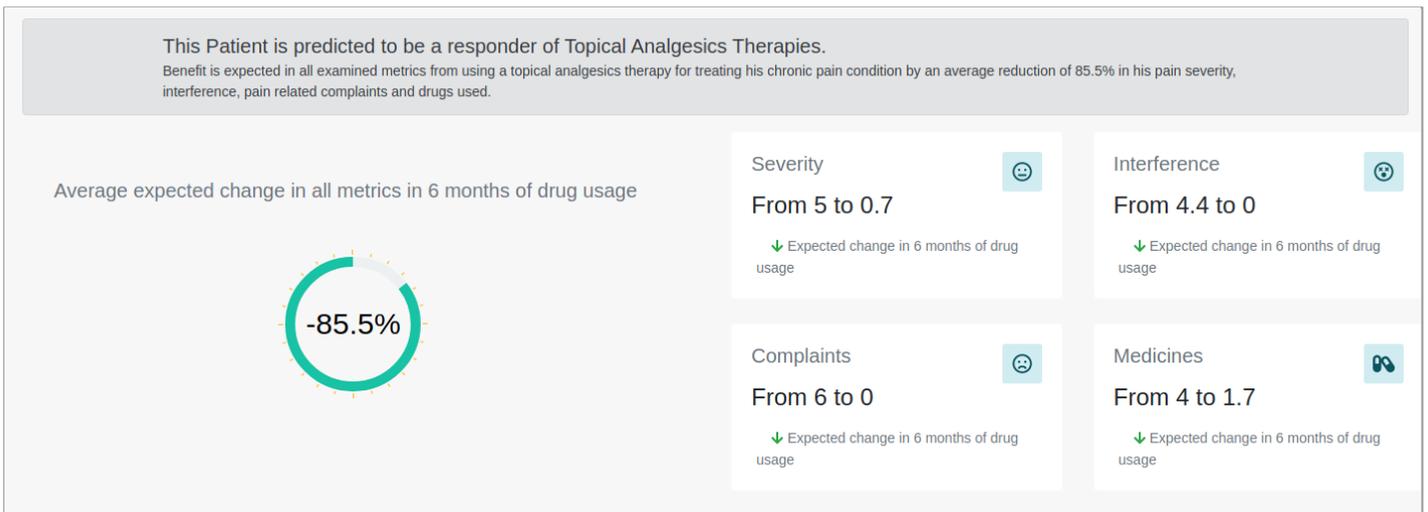


View Test

In the view test page you can see the results of a test with the submitted answers of the questionnaire.

At the top of the screen, you can see a concise result of the submitted test. The patient is predicted to be either a responder or a non-responder for Topical Analgesics Therapies. If the pain situation of the patient is evaluated as mild, then results are not produced and you get informed accordingly. The percentage shown on the result page of responders and non-responders shows the predicted average reduction (or increase) in the patient's pain severity, interference, pain related complaints and drugs used with the best performing non-opioid treatment:

Responder of Topical Analgesics Therapies



Non - Responder of Topical Analgesics Therapies

This Patient is predicted to be a non-responder of Topical Analgesics Therapies.
 This patient is classified in the non-responders group since he is not predicted to benefit in ALL examined metrics from using a topical analgesics therapy for treating his chronic pain condition. However he may still benefit in some of them - see detailed results.

Average expected change in all metrics in 6 months of drug usage



Severity From 5 to 0.1 ↓ Expected change in 6 months of drug usage	Interference From 4.4 to 0.4 ↓ Expected change in 6 months of drug usage
Complaints From 2 to 0 ↓ Expected change in 6 months of drug usage	Medicines From 1 to 2.4 ↑ Expected change in 6 months of drug usage

Mild pain situation

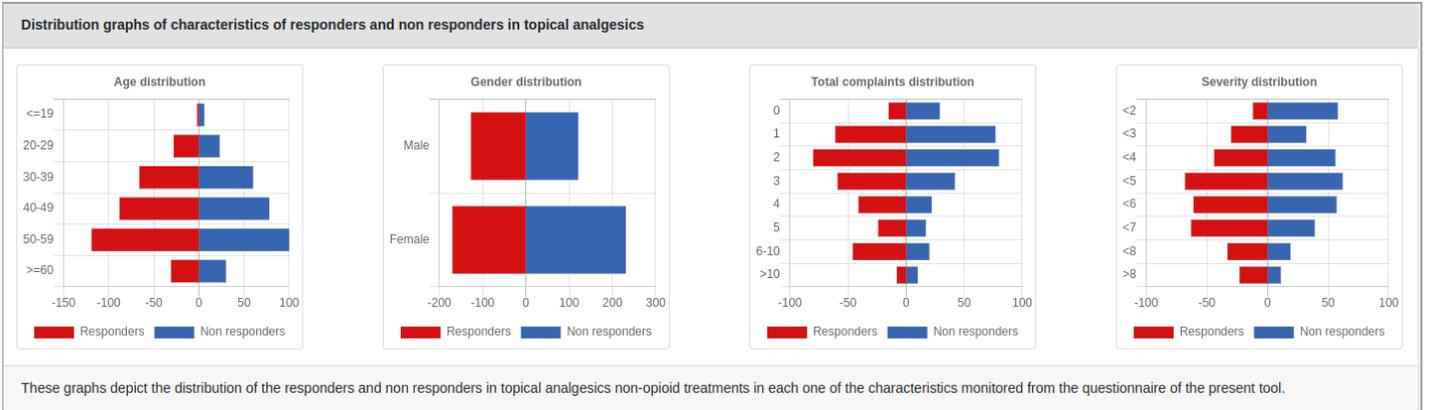
This tool has been designed to personalize response to therapy treatments for severe chronic pain cases and/or patients administered with Opioids or Anticonvulsants.
 The chronic pain situation of the patient is evaluated as mild and thus he is not suitable for the provided test. The clinician should consider administering a mild pain treatment.

Furthermore a “Detailed results for each topical analgesic” part shows detailed results for the 4 different formulations:

Detailed results for each topical analgesic

Total: -59.1% Severity: -52% Interference: -41.7% Complaints: -64.1% Medicines: -78.8% Responder for Formulation 1: Diclofenac with no ketoprofen or flurbiprofen Includes treatment with Diclofenac+Amitriptyline plus any combination of the following topical analgesics or Vitamins: Formulation with Ketamine+Tramadol, MgCl+Fluoxetine+Bupivacaine+Clonidine, Lidocaine, Neuropathic Vitamin	Total: -59.4% Severity: -51.5% Interference: -41.7% Complaints: -64.1% Medicines: -80.3% Responder for Formulation 2: Ketoprofen with no diclofenac or flurbiprofen Includes treatment with a combination of the following topical analgesics/vitamins: Cyclobenzaprine, Ketoprofen, Lidocaine, Neuropathic Vitamin.	Total: -59.1% Severity: -51.9% Interference: -41.7% Complaints: -64.1% Medicines: -78.8% Responder for Formulation 3: Flurbiprofen with no diclofenac or ketoprofen Includes treatment with Flurbiprofen+Amitriptyline, MgCl+Gabapentin+Bupivacaine and Neuropathic Vitamin if the clinician decides it is suitable for the patient.	Total: -59% Severity: -51.6% Interference: -41.7% Complaints: -64.1% Medicines: -78.8% Responder for Formulation 4: Other with no Nonsteroidal anti-inflammatory drugs (NSAID) Includes treatment with a Sinelee Patch (or other available Capsaicin and Menthol patch) alone or in combination with any other no Nonsteroidal anti-inflammatory drugs including: Lidocaine, Lidocaine and Neuropathic Vitamin
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Additionally, a “Distribution graphs of characteristics of responders and non responders in topical analgesics” part depicts the distribution of the responders and non responders in topical analgesics non-opioid treatments in some of the characteristics monitored from the questionnaire of the present tool:



In the final part of the result page you are able to view the submitted responses of the patient’s questionnaire. In this part you have also the opportunity to delete the submitted test by clicking at the bottom of the page the relevant button  :

View submitted responses

Date of survey: 2021-02-26 

Primary complaint/ Diagnosis

Arthritis Hands Feet Hips Knees Neck Shoulders Back Other

Neuropathy or Radiculopathy (Radiating pain) Hands Feet Neck Back Sciatica Other

Myofascial/ Musculoskeletal Pain or Spasm Neck Shoulder Back Hips Other

Tendinitis Shoulder Elbow Knee Wrist Hip Other

Other

How to get InSyBio Precision Chronic Pain Treatment Tool

To purchase InSyBio Precision Chronic Pain Treatment Tool contact us at info@insybio.com.

About Us

InSyBio Ltd is a bioinformatics pioneer company (www.insybio.com) in personalized healthcare, that focuses on developing computational frameworks and tools for the analysis of complex life-science and biological data in order to develop predictive integrated biomarkers (biomarkers of various categories) with increased prognostic and diagnostic aspects for the personalized Healthcare Industry.

InSyBio Suite consists of tools for providing integrated biological information from various sources, while at the same time it is empowered with robust, user-friendly and installation-free bioinformatics tools based on intelligent algorithms and methods.

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