



March 2017

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GENERAL INTRODUCTION

Prescribing exercise in the presence of different concomitant cardiovascular diseases (CVDs) and risk factors within the same patient is a challenging task for both novice and experienced practitioners.

The EXPERT tool is a decision support system that provides a personalized exercise prescription that follows the latest EAPC guidelines and evidence.

It considers:

- 10 CVDs,
- 5 CVD risk factors
- 3 common chronic non-CV conditions,
- baseline exercise tolerance,
- common CV medications, and
- occurrence of adverse events during exercise testing

You can use the EXPERT tool by typing (or copying) the following URL in your preferred Internet browser:

<https://EXPERT tool.edm.uhasselt.be>

If you wish to get the registration code, please login to My ESC at <https://idp.escardio.org/idp/login.jsp>

Contact.

If you require further support or have any question regarding the EXPERT tool you can send an email to expert-tool@uhasselt.be, the UHasselt-EDM researchers involved in the realization of the EXPERT tool will handle your request.

Minimum requirements.

You can access the EXPERT tool using any of the popular Internet browsers. **We strongly recommend you to install the latest version of the browser of your preference as this typically includes important security updates and the latest web standards necessary for the correct behavior of the EXPERT tool.** Please note that Microsoft no longer support Internet Explorer older than version 11.

We are constantly trying to improve our tool to ensure its correct functionality; however, we strongly recommend using Google Chrome to access the EXPERT tool.

The minimum screen resolution required to use the EXPERT tool is 1024×768 pixels.

A note about zoom levels in the browser.

In case the resolution of your screen is bigger larger than 1024×768 pixels, but you cannot see all the content of the page, it might be due to a problem with the zoom level of the browser or the operating system.

You can adjust the zoom of the browser, and thus the size of the content, by pressing **CTRL** and **+** in the keyboard to make it bigger and **CTRL** and **-** to make it smaller. Press **CTRL** and **0** in order to reset the zoom level on the browser. For more information about setting up a zoom level in your preferred browser, please visit the appropriate help section. A few examples are provided below:

Google Chrome:

<https://support.google.com/chrome/answer/96810?hl=en>

Mozilla Firefox:

<https://support.mozilla.org/t5/Firefox-Display-and-Appearance/Font-size-and-zoom-increase-the-size-of-web-pages/td-p/3625>

Microsoft Edge:

https://answers.microsoft.com/en-us/windows/forum/windows_10-networking/zoom-in-microsoft-edge/24f719ab-3855-4e85-9f33-bd874b52775a

Apple Safari:

https://support.apple.com/kb/PH21489?locale=en_US

In case the previous steps did not solve the problem, please try to change the zoom factor of the operating system. For more information about setting up a zoom level operating system, please visit the appropriate help section. A few examples are provided below:

Windows:

<https://support.microsoft.com/en-us/help/27928/windows-10-make-windows-easier-to-see>

Ubuntu:

<http://askubuntu.com/questions/82398/how-to-zoom-in-zoom-out>

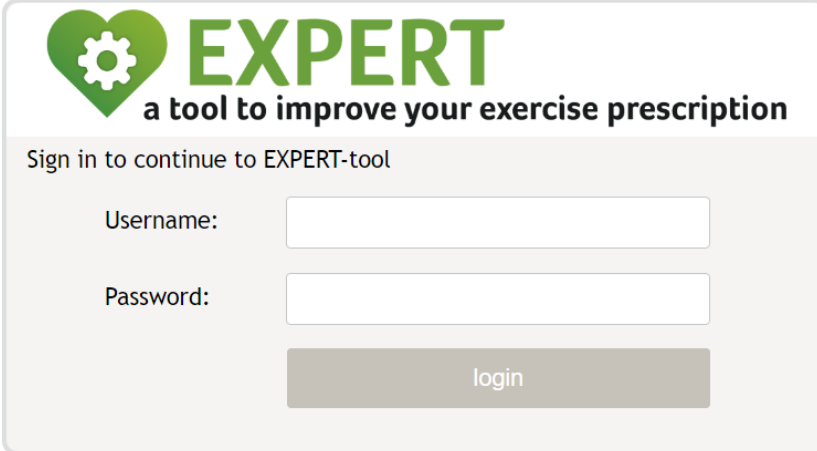
iOS:

<https://support.apple.com/en-us/HT202613>

LOG IN

This is the first screen you encounter when navigate to the EXPERT tool in your Internet browser. Log in into the system by using the username and password you chose during the registration process.

In case you lose your password, you will need to contact the EXPERT tool team in order to restore it. We request you to do that for security reasons and to ensure the privacy of the data you add into the system.



The image shows a login form for the EXPERT tool. At the top left is a green heart icon containing a white gear. To its right, the word "EXPERT" is written in large, bold, green capital letters. Below "EXPERT" is the tagline "a tool to improve your exercise prescription" in a smaller, black, sans-serif font. Below the logo and tagline, the text "Sign in to continue to EXPERT-tool" is displayed. Underneath this text are two input fields: "Username:" followed by a white rectangular box, and "Password:" followed by another white rectangular box. Below the password field is a grey rectangular button with the word "login" written in white text.

[get your account here](#)

Figure 1: Log in form

Registration process

The first step to get an account for the EXPERT tool is to pay the registration fee through My ESC site. After the payment confirmation, you will receive registration code that you have to use when you fill out the registration form in the EXPERT tool.

To open the registration form click on the link *“get your account here”* that you find below the login controls depicted in Figure 1.

Once in the registration form (see Figure 2), complete all the requested information and then click on the *“register”* button. Fields marked with the * symbol are mandatory. ***Keep in mind that the email account you register will be your key to reset your password in case is necessary.*** In case you participated in the pilot testing of the EXPERT tool, and would like to import any real patient records generated during that stage, please make sure that you mark the *“I joined the pilot study”* option.

Please copy the registration code from My ESC system (<https://www.escardio.org/>) and paste it into the field *“expert code”* before you proceed with the registration. Note that the system links the registration code to your account and cannot be reused by any other user.

Once you click the *“register”* button and the system adds your data our database, the system will automatically redirect you to the EXPERT tool *“Recommendation center”* page.

If you want to cancel the registration process before clicking on the *“register”* button, simply click on the link *“back to login page”*, or close the web page.

Fill this form out to get access to the EXPERT-tool. All fields are necessary.

Personal data

*first name:	<input type="text"/>
*last name:	<input type="text"/>
*country:	<input type="text" value="Choose a country"/>
*e-mail:	<input type="text"/>
*confirm your e-mail:	<input type="text"/>
diploma:	<input type="text"/>
current job:	<input type="text"/>
years of experience in this position:	<input type="text"/>

User account data

*user name:	<input type="text"/>
*password:	<input type="text"/>
*confirm your password:	<input type="text"/>

Registration code

*code:	<input type="text"/>
I joined the pilot study:	<input type="checkbox"/>

register

[back to login page](#)

Figure 2: Registration form

DISCLAIMER

You will see a disclaimer after you have logged in into the system. Read the disclaimer carefully. Following you have to click the “I agree” button to start using the EXPERT tool.

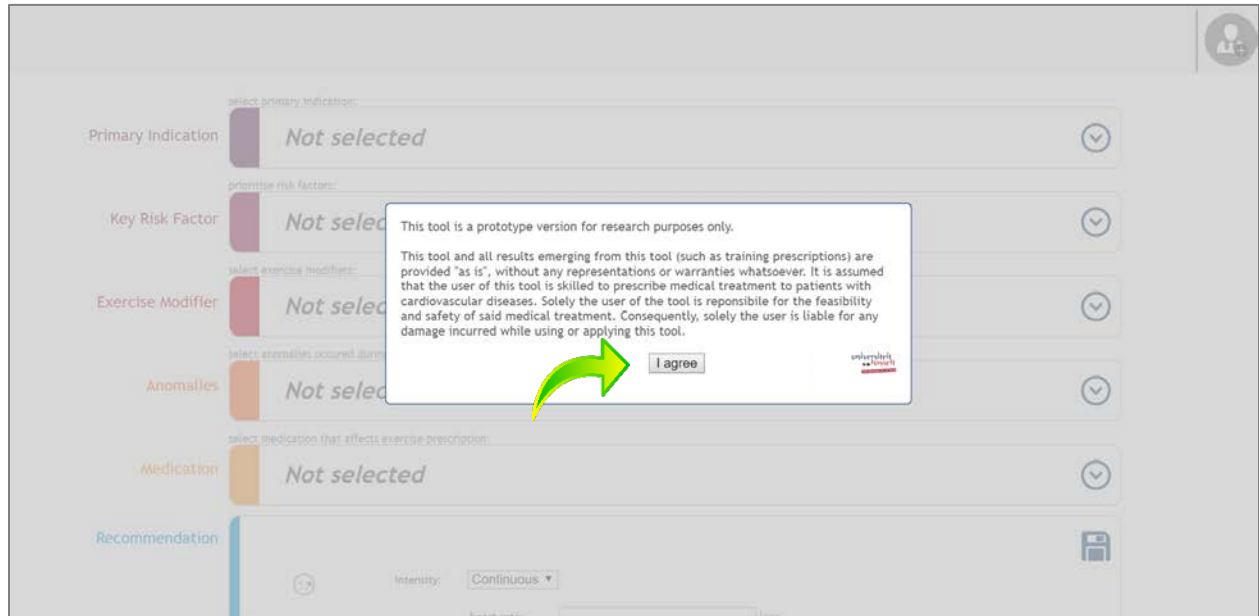


Figure 3: Disclaimer

You will see this disclaimer every time you open the *Recommendation center* and the *Training center* of the EXPERT tool.

Creating a patient's record

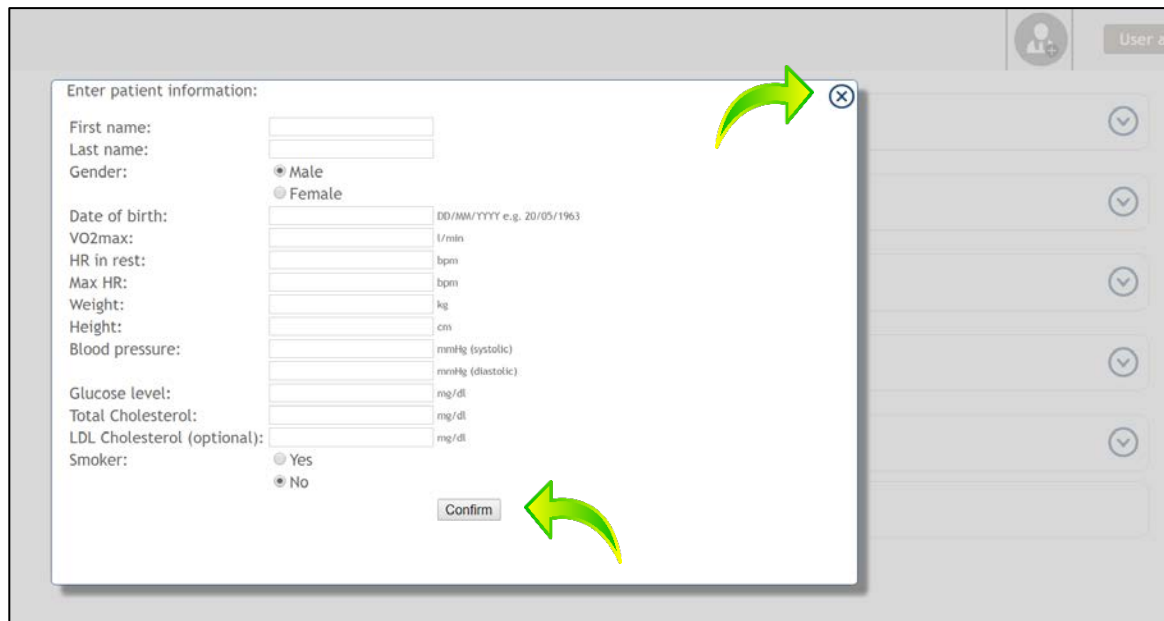
You can add a patient record by clicking on the circular button in the bar with action buttons (with a gray background). The button is highlighted in Figure 4.



The screenshot shows the 'Recommendation center' interface. At the top right, there is a navigation bar with 'User account', 'Training center', and 'Logout' buttons. Below this, a circular button with a person icon is highlighted by a green arrow. The main area contains several dropdown menus for selection: 'Primary Indication' (Not selected), 'Key Risk Factor' (Not selected), 'Exercise Modifier' (Not selected), 'Anomalies' (Not selected), and 'Medication' (Not selected). At the bottom, there are links for 'History of recommendations', 'Safety Precautions', and 'Links to ESC exercise training guidelines'.

Figure 4: Recommendation center screen

When you have clicked this circular button, you will see that the form shown in Figure 5 will appear.



The screenshot shows a modal form titled 'Enter patient information:'. It contains the following fields: 'First name:', 'Last name:', 'Gender:' (with radio buttons for 'Male' and 'Female'), 'Date of birth:' (with a date format example 'DD/MM/YYYY e.g. 20/05/1963'), 'VO2max:' (l/min), 'HR in rest:' (bpm), 'Max HR:' (bpm), 'Weight:' (kg), 'Height:' (cm), 'Blood pressure:' (mmHg systolic and mmHg diastolic), 'Glucose level:' (mg/dl), 'Total Cholesterol:' (mg/dl), 'LDL Cholesterol (optional):' (mg/dl), and 'Smoker:' (with radio buttons for 'Yes' and 'No'). A 'Confirm' button is located at the bottom right of the form. A green arrow points to the 'Confirm' button, and another green arrow points to a close button (X) in the top right corner of the modal.

Figure 5: Patient's information form

In order to add the patient's information, you have to fill out all fields in the form and click on the "Confirm" button when you are done. It is required to fill out **all** the fields in this form, **except LDL**

cholesterol. If you do not want to add a patient, you can close the form by clicking on the circular “cross” button in the top right corner of the form. All patients that you add appear in the drop down list in the top left corner of the page (Figure 6). You can consult the patient data by clicking on the patient’s name in this list.

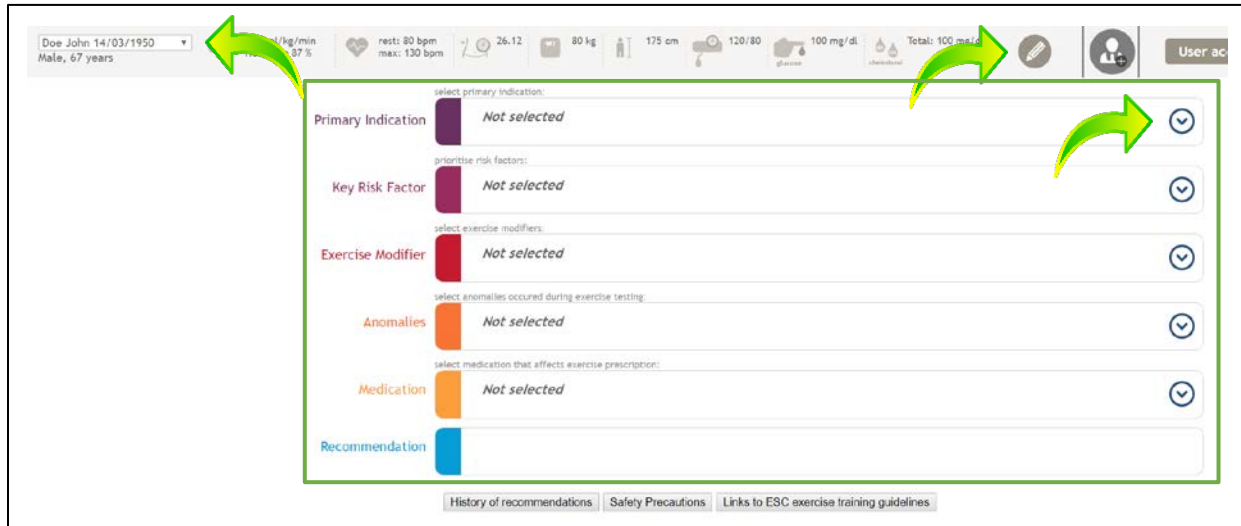


Figure 6: Screen with patient's information in top bar

The patient’s information is now visible in the grey bar in the top of the screen. You can modified this information by clicking on the circular ‘pencil’ button highlighted on Figure 6. The screenshot (Figure 7) below shows a more detailed description of the icons in this bar. You can also see this information in the EXPERT tool by hovering over the corresponding icon or value.

case1n case1fn 26/02/19 Male, 66 years	VO2 38.46 ml/kg/min 2.5 L/min 130 %	rest: 55 bpm max: 123 bpm	22.23	65 kg	171 cm	145/82	95 mg/dl glucose	Total: 180 mg/dl cholesterol
	Vo2 max	Rest heartrate Max heart rate	BMI	Weight	Height	Blood pressure	Glucose level	Cholesterol level

Figure 7: Bar with patient information

You can find the boxes with all the parameters of the cardiovascular diseases below the patient information. There are five boxes, one for each of the categories included in the EXPERT tool algorithm: **primary indications**, **key risk factors**, **exercise modifiers**, **anomalies** and **medication**. You can open each box (shown in the rectangle in Figure 6) by clicking on the arrow button in the right side of the box. The screenshot below shows an example of an opened box.

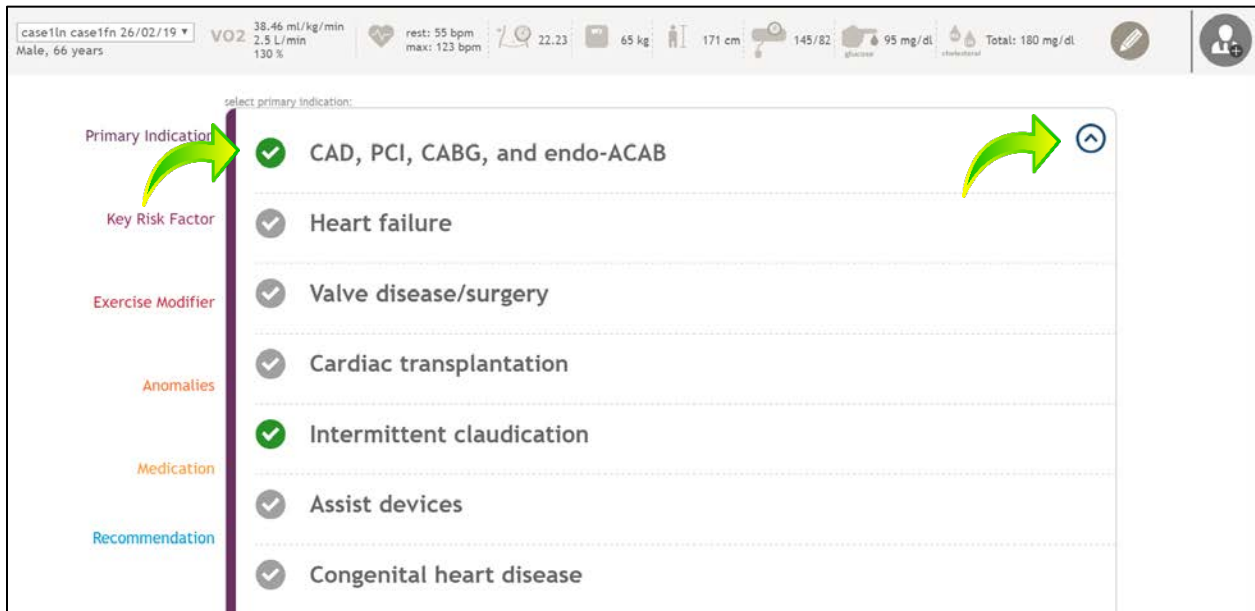


Figure 8: Opened 'Primary indication' box

Select applicable diseases

You can select each of the diseases, applicable for the patient, by clicking on the corresponding checkbox in front of the disease. Figure 8 shows the box of "Primary indications". You can select the **risk factors**, **exercise modifiers**, **anomalies** and **medication** likewise. You can close the box by clicking the button you used to open the box. The tool automatically selects some risk factors based on the patient's information, e.g. when the patient's BMI is too high, the system will select obesity.

Anomalies and medication will not have an individual recommendation. For some cases in the *Anomalies* box, you have to define the heart rate, which the patient had when the anomaly occurred.

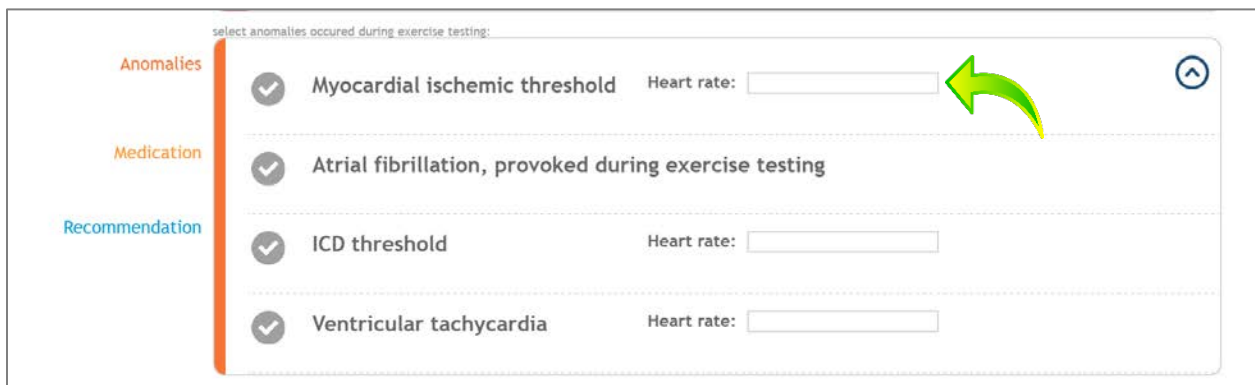


Figure 9: 'Anomaly' box

The system suggests a recommendation automatically after you select the applicable diseases. The suggestion is based on all the selected diseases and patient's information. You can find this recommendation in the blue box that is highlighted in Figure 10.

The screenshot shows a user interface for selecting patient factors and receiving a recommendation. The factors are:

- Primary Indication:** Heart failure (M or HIT, daily in M, 30-40, 8-16 weeks, yes)
- Key Risk Factor:** Hypertension (M up to H, daily, 30-60, >6 weeks, yes)
- Exercise Modifier:** COPD (M or HIT, 3 up to 5, 20-60, >6 weeks, yes)
- Anomalies:** Not selected
- Medication:** Not selected
- Recommendation:** Moderate HR: 105-128, daily in M, 20-60 min, >16 weeks, Yes. Includes a note: "Add inspiratory muscle training (IMT), Additional isometric handgrip exercise".

At the bottom of the recommendation box, there are buttons for "History of recommendations", "Safety Precautions", and "Links to ESC exercise training guidelines". A green arrow points to the "save" button (floppy disk icon) in the recommendation box.

Figure 10: Suggested recommendation

This box has also a field with additional training tips. The full content of this field can be viewed by hovering over the field with the mouse cursor (Figure 11), or when you open the recommendation by clicking on the “pencil” button.

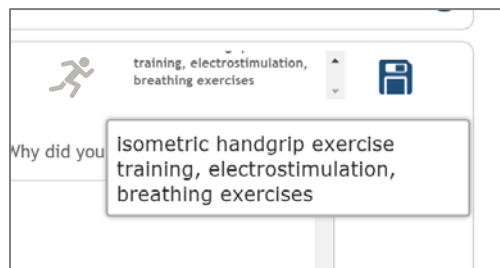


Figure 11: Full content of 'Additional training' field

Accept/modify recommendation

You can click on the “save” button (the floppy disk icon) if you agree with the suggested recommendation (Figure 10). You can click on the “pencil” button if you want to modify the recommendation to a more suitable recommendation. Figure 12 shows the content of the “recommendation” box after clicking this “pencil” button.

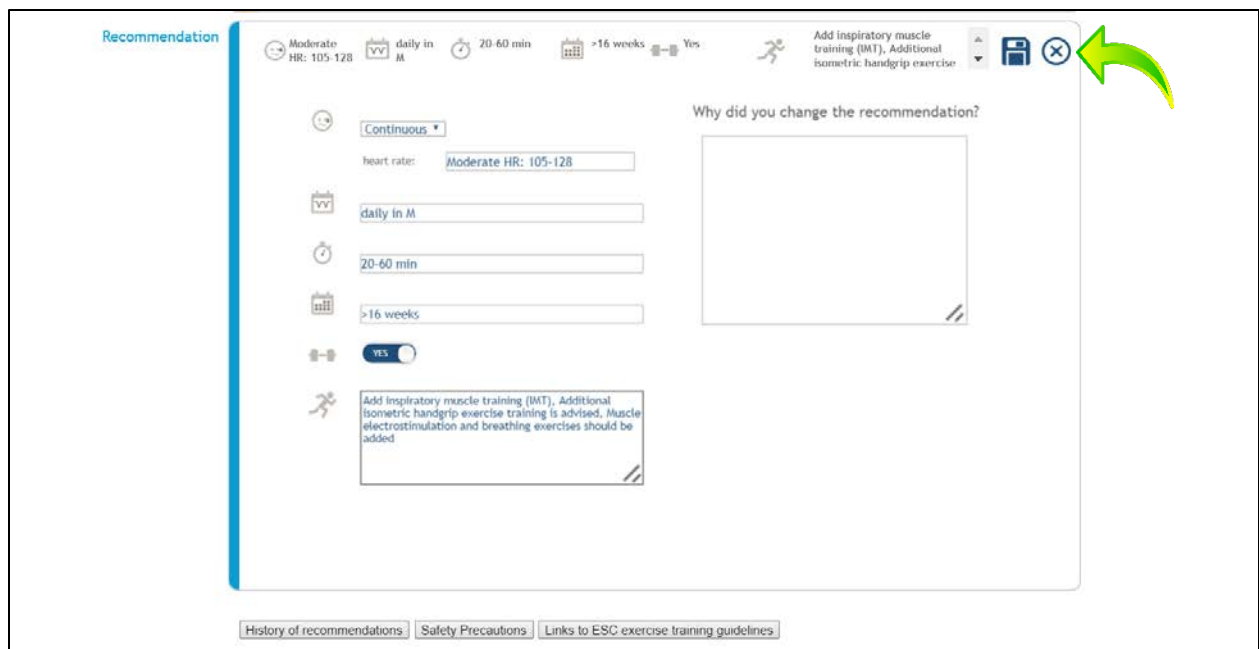


Figure 12: Opened 'Recommendation' box to modify suggested recommendation

You can change all the fields, in that case, we advise you to formulate the reason why you have changed the recommendation. This extra information can serve as a future reference when analyzing the data of the patient.

The "undo changes" button will appear when you have made changes in the recommendation (see Figure 13). You can click this button if you want to undo your changes in the recommendation. Changes can be saved by clicking the "save" button (the floppy disk icon). You can click on the "cancel/close" button (the "x" icon) if you want to go back to the initial recommendation and collapse the recommendation box (Figure 12).

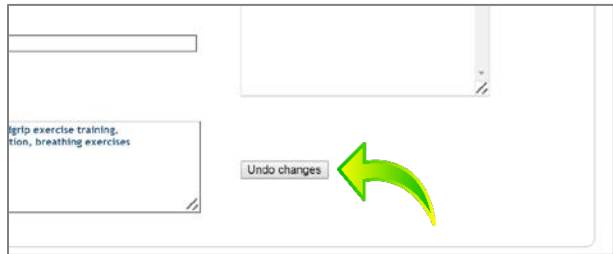


Figure 13: 'Undo changes' button

A new training program or continuing with an ongoing one

The second time you save a recommendation for a patient, you will have to choose between starting a new training program or considering the new recommendation as a follow up recommendation, part of the last training program. Figure 14 shows the dialog where you can choose the type of recommendation you are saving.

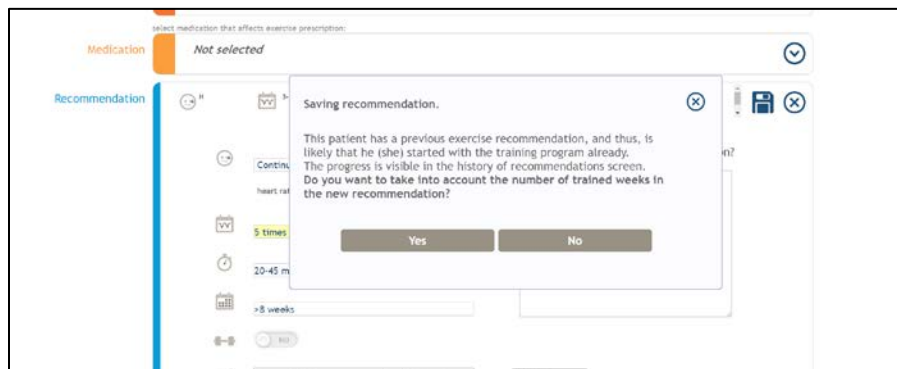


Figure 14: Choosing the type of recommendation to save

This decision will not have any influence on the exercise training recommendation. Considering a recommendation as the beginning of a training program, or taking into account the number of weeks since last recommendation that started a training program has only informative purposes. This information is available when you visualize the history of recommendations of a patient.

Safety precautions

You can consult the safety precautions by clicking on the button below the recommendation box. This will open a pop up window with the list of safety precautions according to the exercise recommendation.

You can open or close the different boxes by clicking on each one of the categories. You can close the pop up window by clicking on the “x” button in the top-right corner.

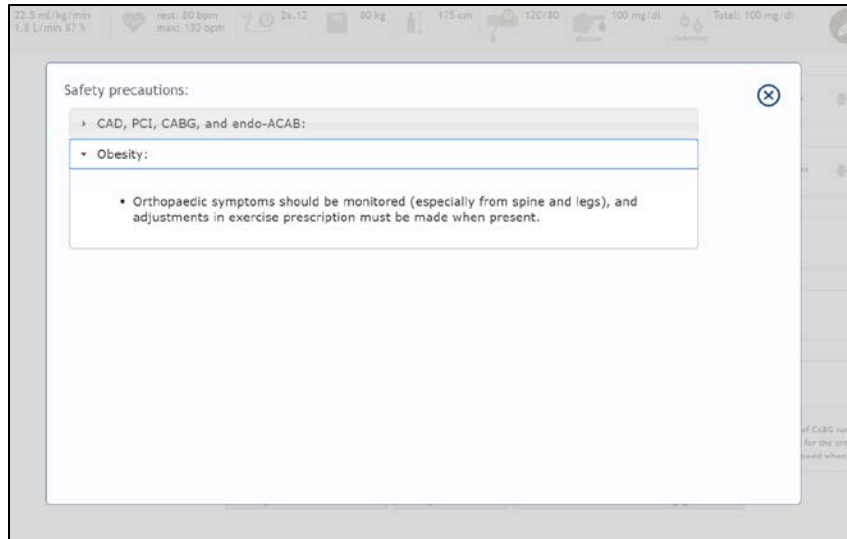


Figure 15: Displaying the safety precautions list

Extra information about the ESC training guidelines

Read extra information about the latest ESC training guidelines using the ESC exercise training guidelines that you can find in the EXPERT-tool. The button highlighted on the right of Figure 16 opens the dialog where you can get access to a list of **five** papers with extra information that can help you staying up-to-date with your exercise prescription skills.

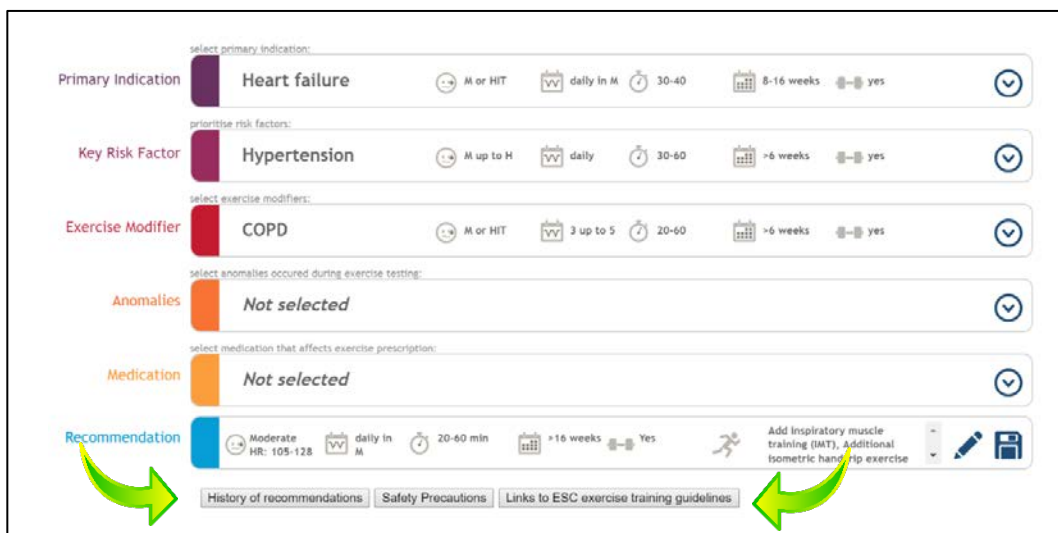


Figure 16: Opening the ESC exercise training guidelines

Once you open the dialog, you can click on any of the titles of the papers to open the detailed view: list of authors, abstract and link to download the PDF. You can close the detailed view by clicking again in the title of the paper.

If you want to download the PDF, click on the link “*Open the paper*”, this will open a new tab in your browser with the webpage of the publisher of the paper. You can download it or print from that page. Please note that there is no link between the EXPERT tool and the publisher of the papers, thus an extra fee may apply if you want to get full access to the paper.

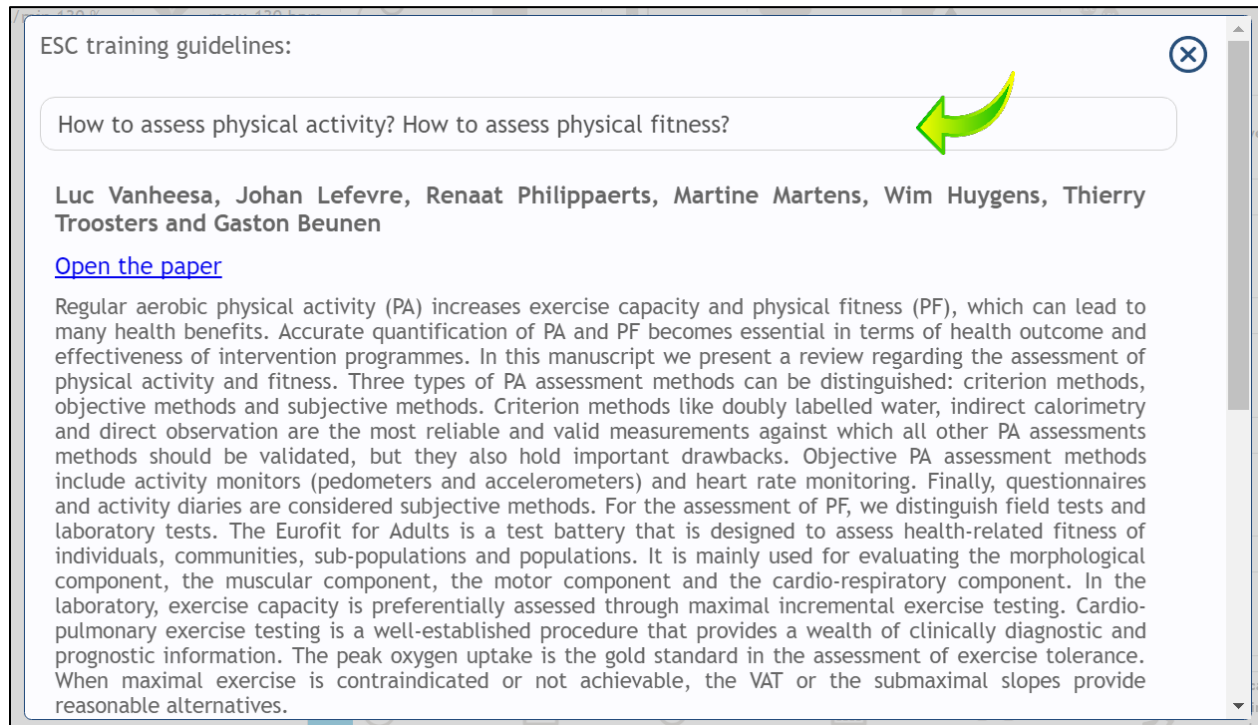


Figure 17: Opening the detailed view of the ESC training guidelines papers

History of recommendations

If you have entered a recommendation for a certain patient before, you can view his/her history of exercise recommendations by clicking on the ‘*History of recommendations*’ button highlighted on the left in Figure 16.

In the *History visualization*, you can review all the exercise prescriptions that you have generated for any of your patients. The latest recommendation, including the physiological parameters and the pathologies of the patient, can be found in boxes with the same colors of the recommendation center of the EXPERT tool. These boxes are highlighted in Figure 18.

If the patient does not have any exercise recommendation saved in the system, all the fields in the visualization will be empty.

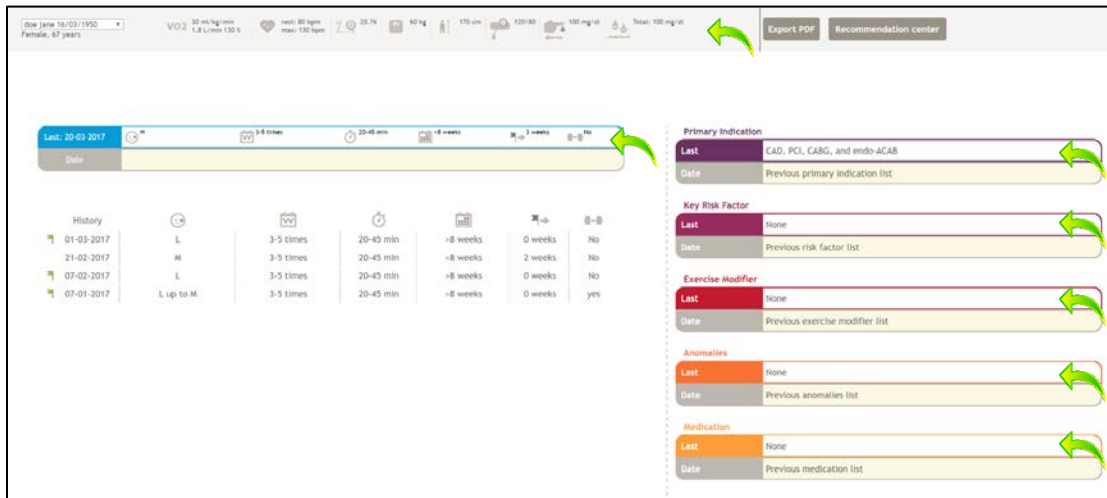


Figure 18: History visualization of the exercise recommendations for a patient

In this view, you can compare the different exercise recommendations that you have prescribed to the patient in the past, with respect to the latest recommendation. To perform this comparison, you have to click on any of the recommendations with previous dates from the table. This action will automatically highlight the chosen row, and show the rest of the information that belongs to the recommendation, as shown in Figure 19. Please note that all the fields belonging to the historic recommendation have the same *beige* background.

The records in the historic table are ordered in descending order, with the latest recommendations higher on the table.

In the history visualization, you can find one extra column compared to the ones in the recommendation center on each recommendation record. Recall that when you save a recommendation for the second time for the same patient, you get to choose if you want to consider the previous training recommendation. The extra column in the history visualization represents the elapsed time between recommendations that are saved as the starting of a new program, and those that were saved as a continuation of an ongoing training program. You can identify this column with the icon . The icon indicates the recommendations that you saved as the starting of a training program.

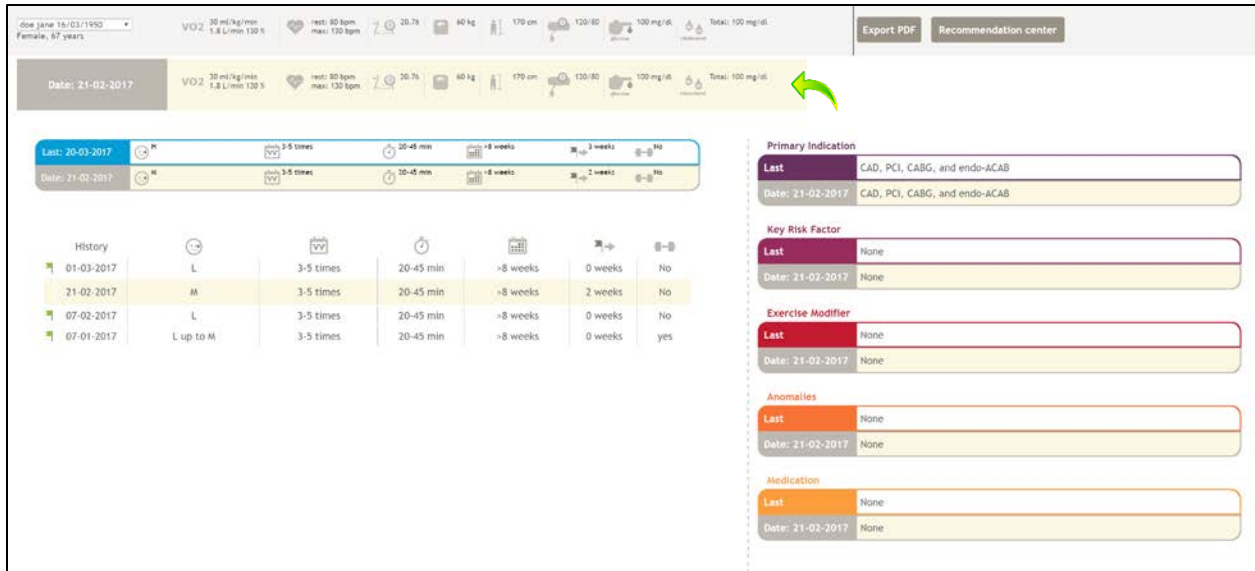


Figure 19: History visualization, comparison between previous recommendation and the current recommendation

Finally, you can export the history of the patient into a PDF file. To do so, you have to click the button "Export PDF", and then you will have to choose the name for the file and the location in your hard disk, as shown in Figure 20.

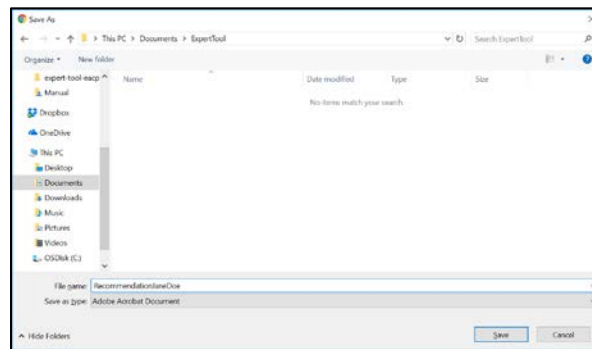


Figure 20: Save as dialog to choose the location and file name for the exported recommendation history

Training center

The *Training center* of the EXPERT tool will let you keep your exercise prescription skills for patients with CVDs up-to-date.

There are two key differences between the *Training center* and the *Recommendation center* in the Expert tool: first, in the *Training center*, you cannot modify the list of predefined cases, and second, you have to provide a recommendation for the cases, and only then you will see the EXPERT tool recommendation so you can compare them.

The predefined cases are grouped according to the complexity of the case (see Figure 21). There are five categories: Starting (white color), Easy (green color), Medium (yellow color), Difficult (orange color), and Rare (red color) cases. You can filter the list of cases in the list by clicking on the category names. The border of buttons of the active categories have a blue border, while the buttons of inactive categories have a gray border.

Names of patients are coded according to their complexity category and their ID. For example, *Easy-Patient 1* is the first patient of the Easy category, and *Rare-Patient 14* is the 14th patient of the Rare cases.

Click on the name of the patients to open and close the list of cases.

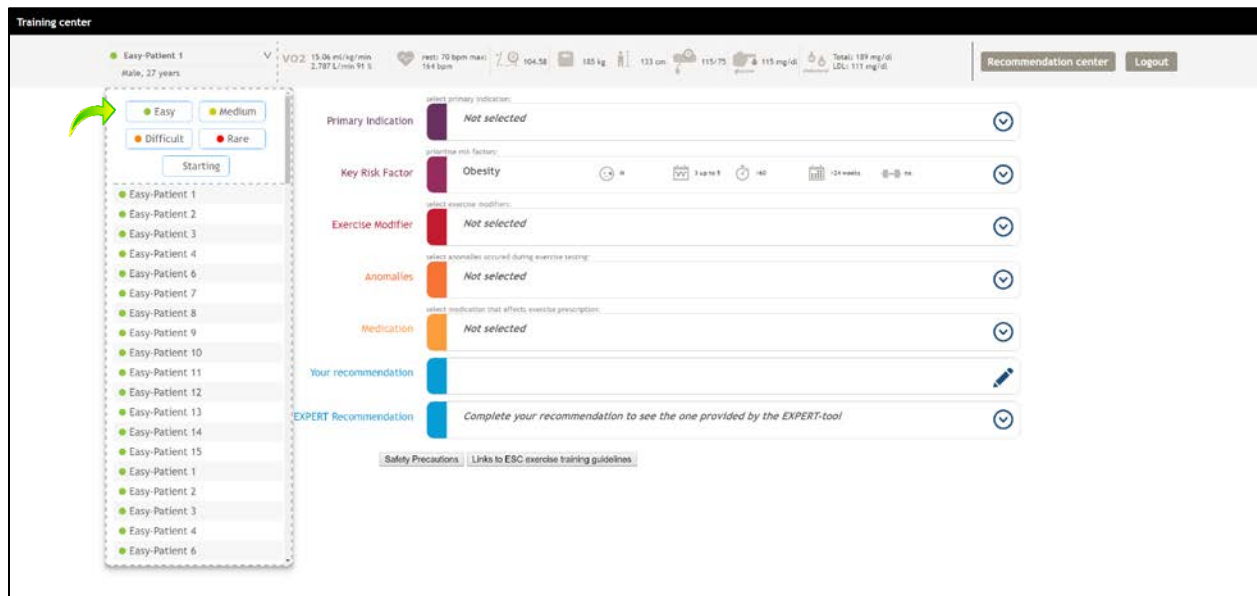


Figure 21: Training center screen

Please note that you have to provide your recommendation in order to enable the EXPERT tool recommendation.

User account

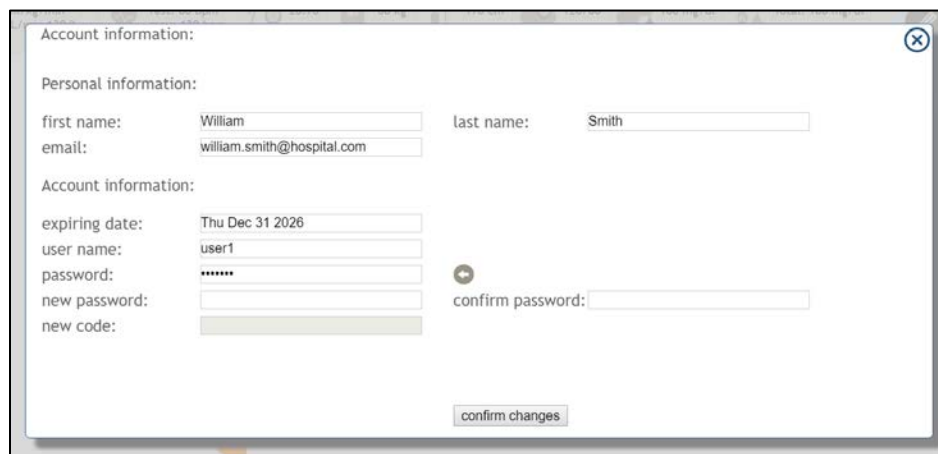
In the **Recommendation center** page, you can find on the top-right corner a button with the label “*User account*”. This button opens a dialog where you find the details of your account in the EXPERT tool (see Figure 22).



The screenshot shows a dialog box titled "Account information:" with a close button (X) in the top right corner. The dialog is divided into two sections: "Personal information:" and "Account information:". Under "Personal information:", there are input fields for "first name:" (containing "William"), "last name:" (containing "Smith"), and "email:" (containing "william.smith@hospital.com"). Under "Account information:", there are input fields for "expiring date:" (containing "Thu Dec 31 2026"), "user name:" (containing "user1"), "password:" (containing "*****"), and "new code:". A pencil icon is positioned to the right of the password field, with a green arrow pointing to it from the right. At the bottom center of the dialog is a button labeled "confirm changes".

Figure 22: User account dialog

In this dialog, you can change your password at any time. To do so, you have to click on the button with the “*pencil*” (highlighted in Figure 22). This will show two extra fields in the form, and then you have to provide your current password, and twice the new password. Click on the button with the arrow pointing to the left, or the button with the “*x*” in order to cancel the changes (see Figure 23). The “*x*” button will also close the user account dialog.



This screenshot shows the same "User account dialog" as Figure 22, but with the password change interface activated. The "password:" field now contains "*****". To its right, a pencil icon is highlighted with a grey circle. Below the "password:" field, two new input fields have appeared: "new password:" and "confirm password:". The "confirm password:" field is currently empty. The "confirm changes" button remains at the bottom center of the dialog.

Figure 23: User account dialog

The field for adding a new code is temporarily disabled. When the time to renew your subscription to the EXPERT tool is around the corner, this field will be automatically enabled.

If you would like to change any of the other fields, or whether you forget your password, please send us an email to expert-tool@uhasselt.be with your request. We will handle it as soon as possible.