



GMFM App⁺

Windows PC and Mac
Desktop App Tutorial



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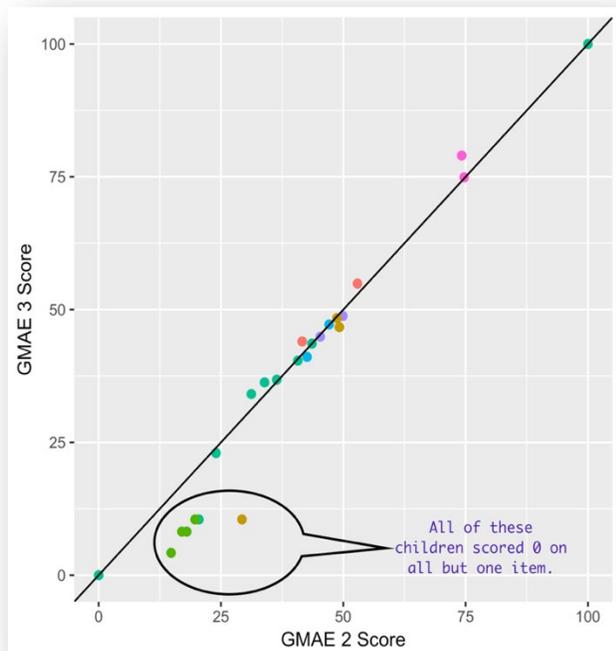
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What is the GMFM App+?

This software is an application version of the Gross Motor Function Measure (GMFM), a clinical tool designed to evaluate change in gross motor function in children with cerebral palsy (CP). The App incorporates the original 88-item measure (GMFM-88) and the more recent 66-item measure (GMFM-66; including Item Sets and Basal & Ceiling), as well as five Motor Growth Curves describing patterns of motor development found among a sample of 650 children in Ontario with CP. The GMFM-66 relies on statistical programming known as the Gross Motor Ability Estimator (GMAE) to convert individual item scores to an interval level total score; the most current GMAE scoring algorithm (GMAE-3) is embedded in the application. The App can also be used to evaluate change in gross motor function over time or with intervention in children with CP. It can be useful in both clinical and research settings.

New features of the GMFM App+

The GMFM App+ uses an updated algorithm (GMAE-3) to calculate GMFM-66 scores. Previously, the GMAE and GMAE-2 imputed a raw score based on the items tested and then converted this to a GMFM-66 score. The updated algorithm computes the GMFM-66 score directly from the item calibrations (item difficulty scores) that the child was tested on. The difference between the GMAE-2 score and the GMAE-3 score will generally be quite small. Discrepancies will tend to be smaller in the middle of the measure (scores between 25-75) and may be larger at the high and low ends of the measure. The largest discrepancies will occur when a child has a single non-zero score; when they score a 1, 2 or 3 on one item and zero on all the other items (see Figure 1). The standard error calculation in the GMAE-3 will likely be the most notable difference. The new standard error reflects the number of items tested and how likely each response was.



The GMAE-3 algorithm reflects a slightly more accurate measure of motor function than the previous algorithm for children with higher and lower functioning and should be the preferred measure moving forward.

The figure is a plot of both scores for a sample of 25 children. The number of items tested ranged from 8 to 66 with a median of 15. The black line represents perfect agreement between the scores.

Figure 1: Score Plots

Versions Available

Two versions of the GMFM App+ are currently available, and are designed as single-user Apps to be downloaded on one device with one user:

- Desktop (Windows PC)
- Desktop (Mac)

Frameworks and softwares used in the development of the App were: NodeJS (Version 8.12), AngularJS (Version 1.4.3), NSIS (Version 3.03).

System Requirements for Running the GMFM App+ on your Device

The GMFM App+ for desktop was designed to function on both Personal and Mac Computers. The following table indicates the amount of storage space necessary for running each product:

Table 2: Storage Space for GMFM App+

Name	Size	Installer File Type
Desktop (Windows PC)	291 MB	.exe
Desktop (Mac)	149 MB	.app

Minimum software requirements are as follows:

Table 3: Minimum Software Requirements

Device	Operating System
Windows PC	Windows 7/Server 2008 R2 or higher (ARM version not supported); Linux Flavors (Ubuntu 12.04 and later, CentOS, Fedora 21, Debian 8)
Mac	OSX 10.11.6 or higher (Only 64-bit binaries)

Minimum hardware specifications:

An intel Pentium 4 processor or later that is SSE2 capable for PC, M or Linux

Downloading the GMFM App+ onto your Device

You will need administrator status on your computer to download the GMFM App+. If your computer is maintained by an IT department, it may be helpful to ask for administrator privileges prior to installation or have your IT department download the App for you.

Double click on the file and follow the prompts.

On the Port Selection page, if the Port does not say 'Port is open', you will need to try another Port number. For example, if TCP Port is closed for 9806, change the number to 9807 (or try any other consecutive number) and click on 'check port'. Once you have found a port that is open, click the next button.

On the components pop-up, ensure that all components are checked off (GMFM, Start Menu Shortcut and Desktop shortcut).

If a Modify C++ screen pop-up appears, you will either be instructed to install or modify. If the pop-up asks you to install, please install the software on your computer. If the pop-up asks you to modify, it is recommended to click on cancel.

Logging In

Once you have downloaded the GMFM App+ onto your device, you will need to register yourself as a user. To register, the following fields are mandatory to complete: first name, last name, username, password and confirm password. Passwords must be longer than 6 characters and contain at least one upper case character, one lower case character and one special character. To save your data, click on the green checkmark at the top of the pop-up window.

You will be required to set 3 security questions (on first log in you will be prompted to complete your security questions). These questions will help you to log into your account should you forget your password. It is important to remember the answers to your questions as there is no email verification process built in.

Note: Remember your Username! When you register for the first time, make sure to keep the record of your username. You can recover the password by answering the security questions you have set up, but NOT the username. If you lose access to your account; it cannot be recovered and you risk losing any saved data you have in the App. To avoid loss of data, we highly recommend regularly scheduled downloads as a backup.

General usage

Once you have logged into the App, you will land on your therapist profile page (see Figure 2). The GMFM App+ has both a left side bar and top bar to help you navigate through the App

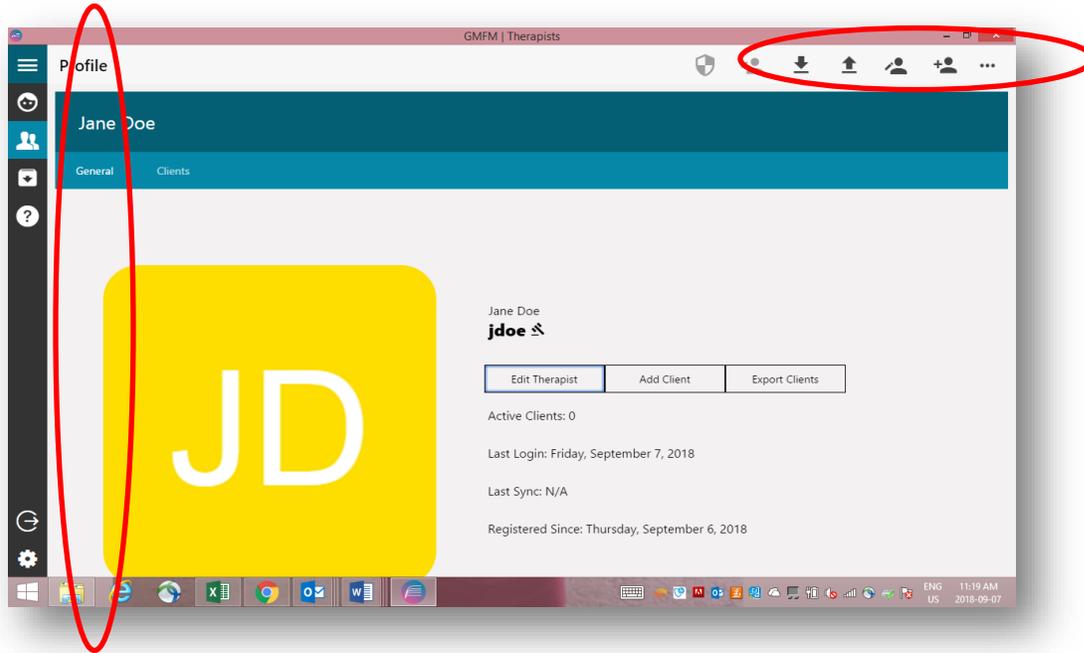


Figure 2: Therapist Profile Page

The left side bar includes the following icons:



Expand left side bar menu



Clients

From the Client page you can:

- View list of clients
- Manage clients (add, edit, archive)
- Add assessments
- Sync or share assessments from another device



Therapist(s)

From this page you can:

- Change your password
- Update your profile and security questions
- View/edit your clients
- Add/edit client assessments
- Import/export client data



Archive client data (viewing archived clients/assessments)



Sign Out



Access help, the tutorial and other helpful resources (including GMFCS Descriptors and Illustrations; GMFCS Expanded and Revised; Motor Growth Curves; Tabulated GMFM-66 Centiles; GMFM-66 and GMFM-88 Scoresheets; GMFM-66 Item Set Scoresheets; GMFM-66 Basal & Ceiling Scoresheets)



Settings

Editing Therapist Profile

Once a Therapist account has been created, all of the information can be edited. To edit the Therapist

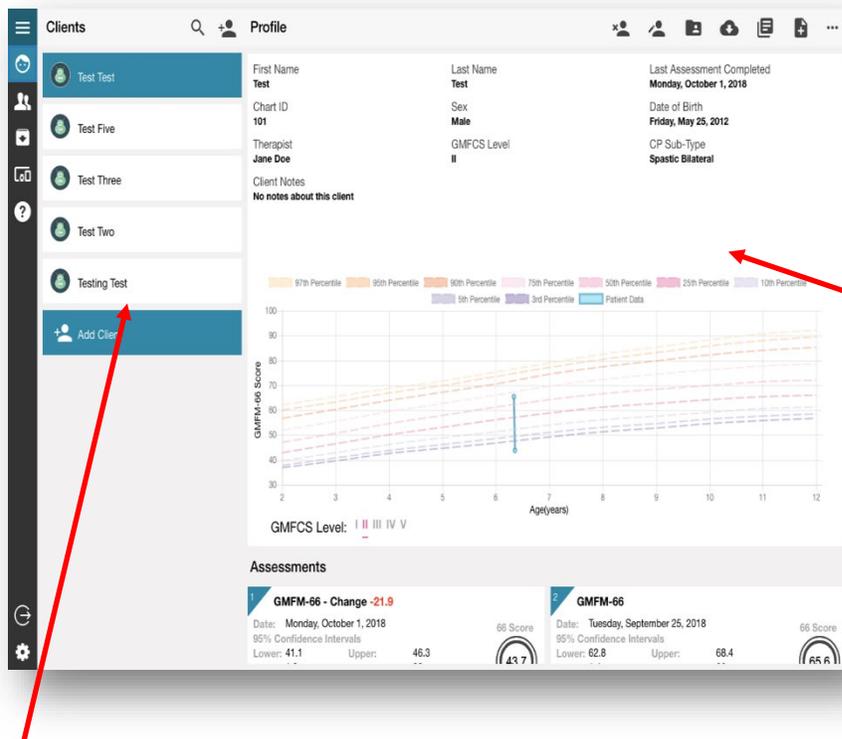
Profile, click on  “Edit Therapist” (or in the Therapist profile page click on “Edit Therapist”). Therapists whose accounts are created by an Administrator should edit their password to something that they will remember.

Editing Therapist profile may also be used if one is transferring an entire caseload of one therapist to another (e.g., in the instance of a therapist retiring or leaving the organization). The Administrator, in this case, can then go into the profile and change all information over for the new therapist.

NOTE: An Administrator can delete a Therapist from the App by clicking on  (clicking “Delete Therapist”) from the Therapist Profile page. When a Therapist is deleted from the App, all clients and their data will be moved to the archive folder.

Creating Clients

To add a client, click on either  button to get to the client profile page (see Figure 3), (then +add client button),  button at the top right-hand side of your screen or from the therapist profile page click on the button “Add client”. A client profile pop-up will appear, and you will need to complete all fields with an asterisk (*). To save the profile, click on the green checkmark at the top of the pop-up screen.



Client Detail Pane

Client List

Figure 3: Client Profile Page

Editing Client

When in the client profile page () , click on  . A pop-up window will appear (Edit Client Profile) with all of the client details. You can then modify any/all data on this page.

Alternatively, from the Therapist Profile page, click on clients in the profile window, click on the client you wish to edit. A view patient profile pop-up window will appear. You can then choose  to edit the client profile.

Adding an Assessment



To add an assessment to a Client's profile page, you must first be in the Client window. From the list of Client names in the left column, click on the Client's name in which you want to add an assessment. The Client's name should now be highlighted blue and their profile will be shown in the right detail pane.

To add an assessment for this Client, either right click on their name and select "Add Assessment", click



on the top menu bar, or scroll to the bottom of the page (under the GMFM Curves and previous assessments completed) and click on "Add Assessment". An add assessment pop-up will appear (see Figure 4). If you choose the Item Sets, the system will ask the user to assess the child on up to 4 items prior to determining the appropriate Item Set to use. Finally, click on the green checkmark to save your selection.

The Assessment Date is automatically set to the current date. If you are entering an assessment from the past, please change the date here.

A screenshot of a software window titled "Add Assessment". The window has a title bar with a plus icon on the left and green checkmark and red X icons on the right. The main content area contains three fields: "Assessment Type*" with a dropdown menu showing "Select an Assessment Type"; "Assessment Date*" with a calendar icon and the date "Monday, September 10, 2018"; and "Assessment Notes" with a text area and a speech bubble icon. On the right side of the form, there are three icons: a document, a calendar, and a speech bubble.

Completing an Assessment

Once you have clicked on the green checkmark, the assessment for which you have chosen will automatically appear on your screen. The assessment will advance automatically once you have completed all items in the dimension (once you have completed all items in Dimension E - a pop-up screen will appear prompting the user to save their data). You can decide to save an assessment without completing all of the items. Any items that were not completed will automatically be saved as Not Tested.

Assessment Summary

The Assessment Summary page (see Figure 5) will automatically be loaded once an assessment is saved. The page can also be found if you are on the Client Profile page and scroll to the bottom where the assessment tiles can be found (under the GMFM Curves). Click on the assessment you would like to view (which will then be highlighted blue).

The page is broken down into three parts:

1. Client information
2. Assessment details and score
3. Item maps (mapped by difficulty and order)

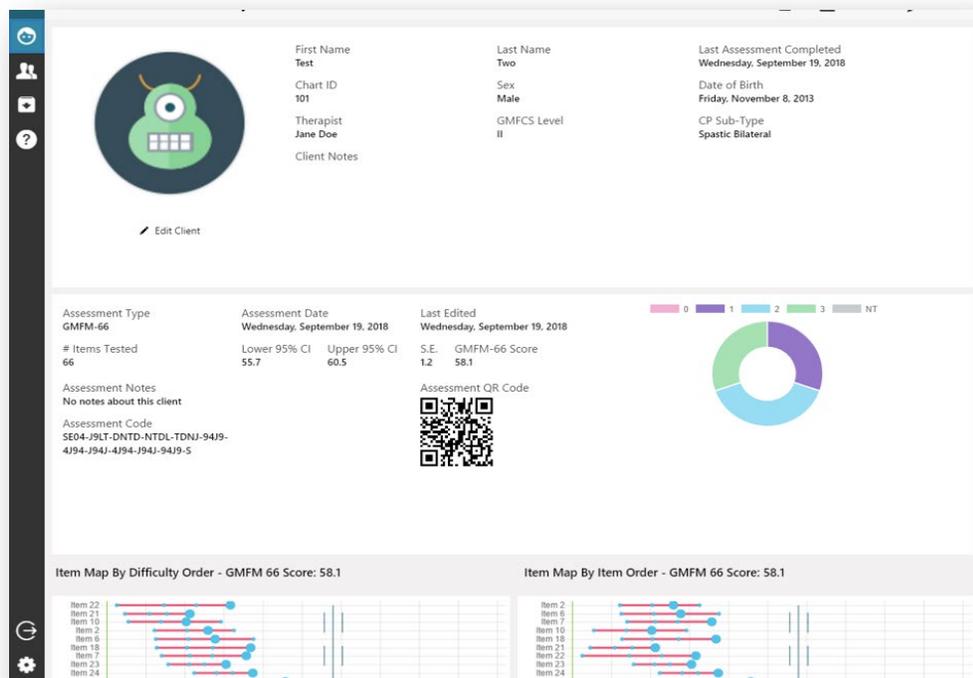


Figure 5: Assessment Summary

Editing an Assessment



Should you wish to edit an assessment after saving, please click on the edit assessment button from the Assessment Summary page. In the edit assessment page, you can change the date of the assessment by clicking on the calendar icon at the top (middle) of the page. You can also change any of the item scores. Remember to click on the green checkmark at the top of the page to save your changes.

Client Summary

To view the client summary page, click on  from the client profile page. On this page (see Figure 6), you will see the client information in the top window, all assessments entered into the App underneath in the left column and an Assessment Summary on the right. The Assessment Summary will graph all of your assessments. However, you must choose which assessments to graph (once selected by clicking on the assessment tile, the assessment will be outlined in blue and a blue dot will be mapped onto the GMFM Curves). NOTE: Make sure the correct GMFCS level is selected (the App should default to the level selected on registering the client). From this page you can print or generate a pdf (icons at top right of the screen).

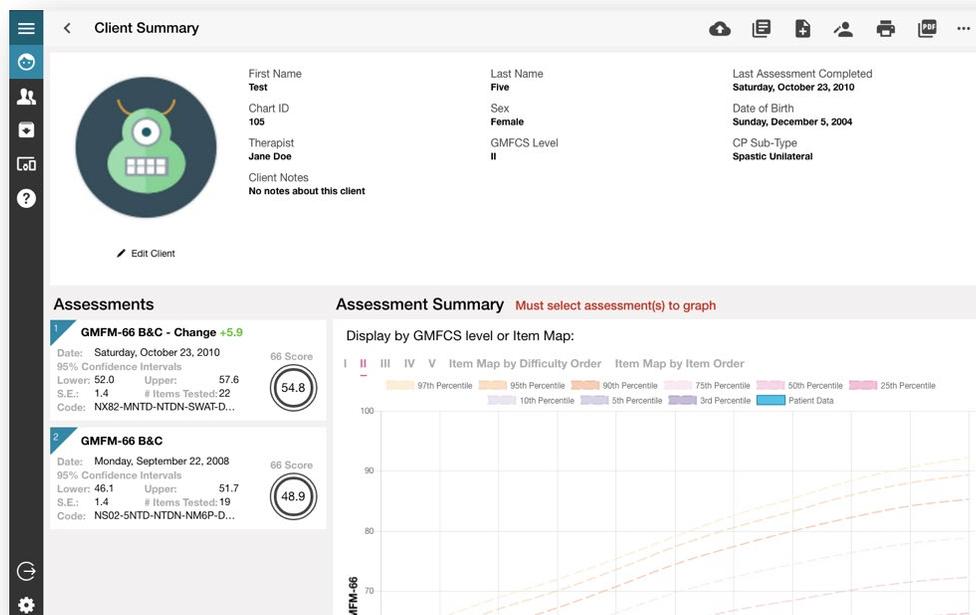


Figure 6: Client Summary (Desktop Version)

Archiving Clients or Assessments

In order to remove a client from a Therapist's caseload or remove an assessment from a client's profile, you will need to Archive the data. Archiving will not delete the client or assessment completely, rather it will file them in the Archive Folder.

To archive a **client**, click on client you wish to archive (must be highlighted blue) then click  from the client profile page or right click on the client's name you wish to archive and select archive client.

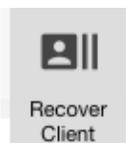


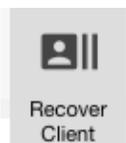
To archive an **assessment**, on the assessment summary page click on . You can also archive an assessment from the client profile page by right clicking on the assessment you wish to archive, then select archive assessment. The App will have an automatic pop up to confirm the move of the data into the archive folder. Once confirmed, the data will be removed from either the Therapist profile or Client profile.

Recovering Archived Clients or Assessments



To recover data that was moved to the archived folder, first click on  from the left hand side bar within the client profile page. To recover an entire client, click on the client you wish to recover from the



left hand column, then click  (or right click on client's name and select Recover Client). The App will then prompt you with the following statement "Are you sure you want to recover this client, you will be set as the assigned Therapist?". Once confirmed by clicking the green checkmark in the pop-up box, the client will be moved to your client list.

To recover an assessment, from the archive page, click on the client you wish to recover the assessment from, then click on the assessment you wish to recover. The App will prompt you to confirm whether you want to recover this assessment. Once confirmed (by clicking the green checkmark on the pop-up window), the assessment will be moved back to the client profile. If the client profile does not exist (outside the archive folder), the client will be recreated with the assessment recovered.

Transferring, Exporting or Importing Data



Transferring

A client's assessments can be transferred between versions of the GMFM App+ for desktop (Windows PC or Mac). To transfer an assessment in, you must first navigate to the client profile page where you want to transfer the data to (have the specific client's name highlighted). NOTE: If you are not in the right client profile page, your assessment will be transferred to the wrong client. Click on the transfer data button and type in the Assessment Code in the version you wish to transfer the data to. Once a valid code has been entered, the system will automatically bring up the assessment and you then must accept it.



Exporting data

Data can be exported into a CSV file which can be opened by Excel and Numbers. To export data, go to the therapist page and click on the export clients button found on the top right bar. The App will then prompt you to save a file. Once saved, you can then navigate to the directory in which you saved the document and open the file. The following fields will be exported: Chart ID, Client Name, GMFCS Level, Classification Type, Assessment Type, all 88 items, GMFM 88 Score, GMFM 66 Score, Sex, Date of Birth, and Assessment Date. NOTE: For MAC users, you may need to save a CSV file via Numbers to allow upload into another GMFM App+ (as some features are removed in the saving process).



Importing data

Data can also be imported from either previous versions of the GMAE program or another GMFM App+. To import data, go to the therapist page and click on the import clients button on the top right bar. Then choose “Open CSV file”. You will then need to navigate on your computer to the location in which the CSV/Excel file is located. All clients within the file will show up in individual tiles. You must go through and check the generated list of clients, making edits where necessary. NOTE: If a client ID from the CSV file already exists in the GMFM App+, in the generated list the client will be set to update (rather than new client). Data will be merged with the existing client ID in the GMFM App+ (this is a problem if they are not the same client). Please ensure that you have a unique ID for each client. Once you have made any updates necessary, click on “Confirm Imported Clients” to have them integrated into the App.

Please note, the GMAE-2 program does not export the following fields: Sex, or Therapist. When importing data, you will need to manually complete these fields before confirming imported clients. Further, when importing, assessment date will be automatically set to the date of import. You will need to correct this by editing each assessment (see edit assessment section above).

Also note, when importing the GMAE or GMAE-2 data, data will automatically be run through the GMAE-3 algorithm thereby modifying the scores based on the more precise GMAE-3 algorithm.