UCSF TabCAT System Manual

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TABCAT

Introduction

Application contents

Tasks and Questionnaires

The TabCAT application consists of 23 tasks that measure various cognitive domains including episodic memory, spatial memory, executive function, processing speed, visuospatial function, socioemotional function, and language. Three tasks are adapted from NIH EXAMINER tasks. In addition, there are 11 questionnaires that are patient-facing, informant facing, and examiner facing.

Batteries

Four tasks and one questionnaire comprise the UCSF Brain Health Assessment (BHA), a validated battery for the detection of cognitive impairment. The BHA will soon feature automated reporting.

Translations

Various tasks and questionnaires have been translated into 16 languages including Arabic, Cantonese, Dutch, English, Finnish, French, German, Greek, Italian, Mandarin, Portuguese (Brazil), Spanish (Argentina, Uruguay), Spanish (Cuba), Spanish (Mexico, Central America, Spain), Swedish, and Turkish. All translations are completed and checked for quality in a rigorous process.

The TabCAT system

Realm refers to a grouping of Studies, Sites, and Users that may have their own database structure.

Site refers to a location where data may be collected as part of a Study. For some users, Site access will limit Study data visibility.

Study refers to a grouping of tasks that have their own data repository in the Realm's database. A Study may collect data at multiple Sites.

Users are assigned to Realms, and to Studies and Sites within the Realm, allowing them to manage the Study and/or collect data on the application. Each user is assigned a role: System Admin, Realm Admin, Study Admin, Clinician, Clinical Trial Study Admin, or Examiner. The permissions appointed to each of these roles are defined on the "User Roles" pages.

For example, a medical research institution like UCSF is a realm. Within the realm UCSF, there may be multiple research studies, all at multiple or overlapping sites, that use TabCAT. Each study may have their own testing batteries, set of users, and hypotheses driving their investigations. The realm UCSF will store data from each study in the same database or server.

The Admin Panel

The Administrative Website, or "Admin Panel" is a hub for managing use of the TabCAT application. Access the Admin Panel at https://mac.ucsf.edu/tabcat. For more information see the "Admin Panel" pages.

User Role Permissions

System Admins at UCSF manage the entire TabCAT system.

Realm Admins are users that are responsible for their realm within TabCAT. They may be study coordinators or data managers, and can manage all studies and sites within their realm.

Study Admins are users that are responsible for their study within TabCAT. They may be study coordinators or data managers, and can add new users, make changes to the task battery, view and edit all data collected by that study, and administer TabCAT tasks.

Clinicians are users that can view and edit data collected by their study (for the sites they have access to) and administer TabCAT tasks, but cannot make any changes to their study.

Clinical Trial Study Admins are users that can view and edit only user-entered data collected by their study (for the sites they have access to) and administer TabCAT tasks. They cannot make any changes to their study.

Examiners are users that can only administer TabCAT tasks. They cannot view or edit data or make changes to their study.
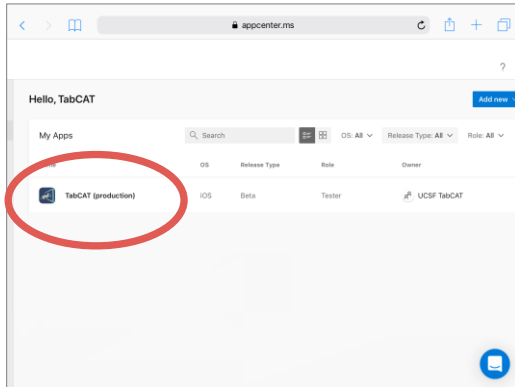
INSTALL TABCAT

App Center

App Center (previously Hockey App) is the platform through which TabCAT is distributed and installed. App Center is accessible via https://appcenter.ms.

Before a new user can access App Center, they must receive an email invitation. Please contact your local study administrator or tabcat@ucsf.edu to request an invitation to use App Center to install TabCAT.
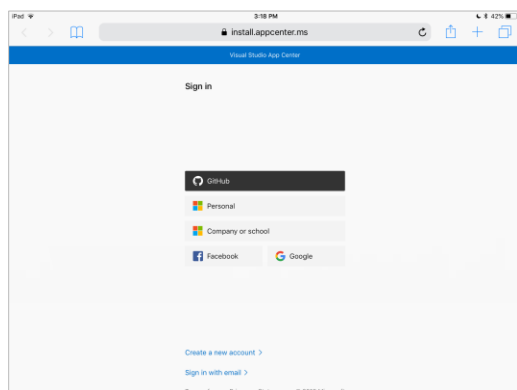

1. When you receive an email inviting you to use App Center to install TabCAT, follow the link inside the email. App Center on your internet browser.
2. If you do not already have an App Center account, select "Create a new account".
3. Create a new account using any credentials that you prefer. Please not that these credentials may be different from your TabCAT credentials.
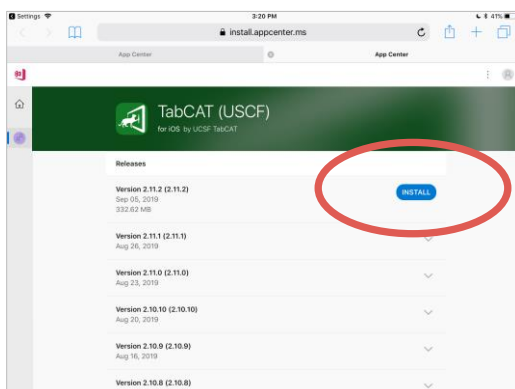
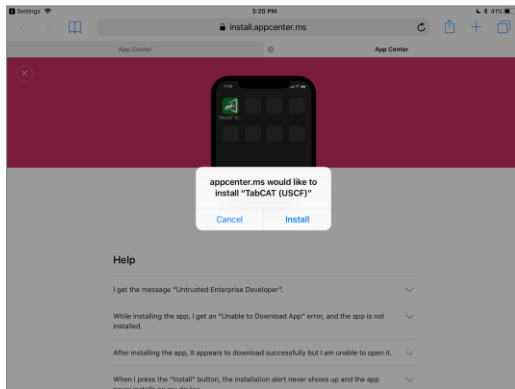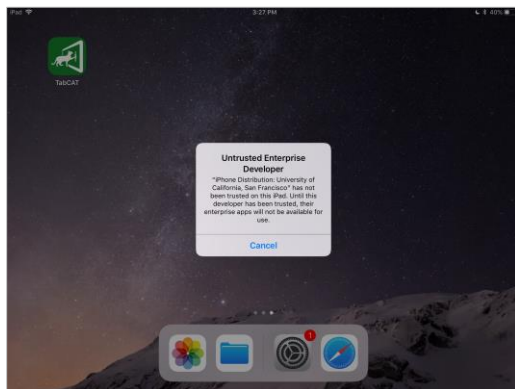4. Select TabCAT (production).
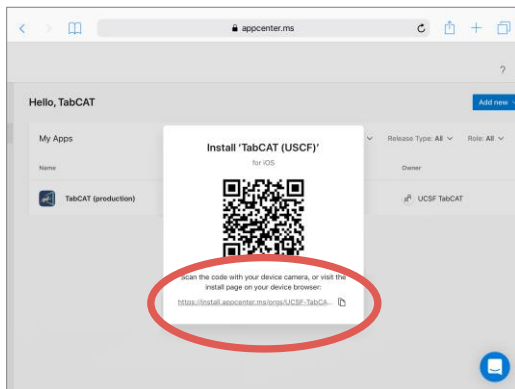
5. Tap the link.
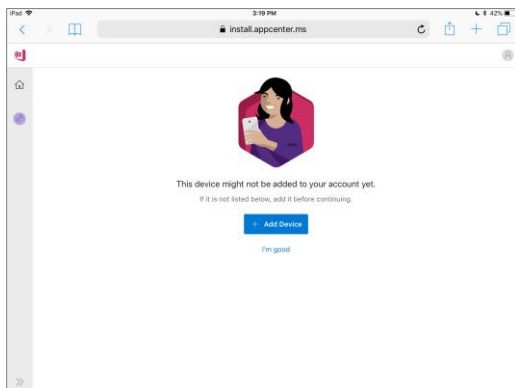
6. Registering your device with App Center is optional.

7. Tap "Install" next to the most current version of TabCAT (this may not match the picture to the left).

8. Tap "Install" on the pop-up. TabCAT will begin installing on your iPad's Home screen automatically.
9. Note the "Help" section on App Center.

If you get the message "Untrusted Enterprise Developer":
- Open iPad Settings and open the "General" tab.
- Tap "Profiles" or "Profiles and Device Management"
- Tap "University of California, San Francisco".
- Tap "Trust" on the pop-up box. You should now be able to open TabCAT and log in using your TabCAT credentials.
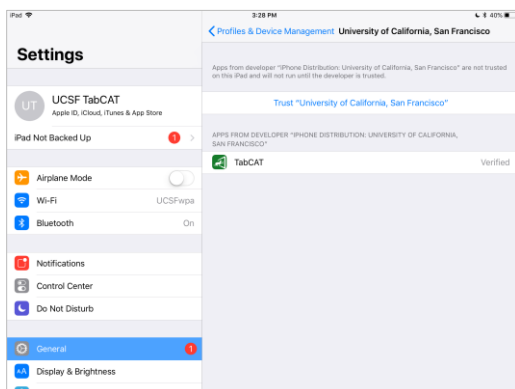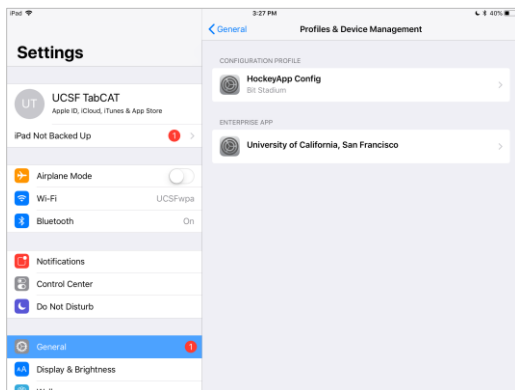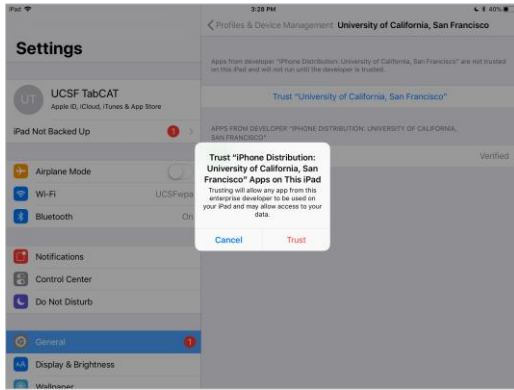
UPDATE TABCAT

v2.10.11

Improvements made in v2.10.11, *16 Sept 2019*

Application

- Updated normative comparisons so that they estimate a patient's closest reference group.
- Fixed a bug where offline authentication was not working properly.
- Added several new summary scores to GAD-7, PHQ-9, and Moral Reasoning.

Admin Panel

- Sites are now a functional part of study design. They exist as parts of the realm like a study or a user, for improved data collection, and study-user-site combinations can limit data visibility for security purposes.
- Redefined the user creation and edit process to quickly add new users to studies and sites.
- Collecting Patient Demographics is now an optional part of each study.
- Updated TabCAT Realm logs to reflect changes made to Sites and Patient Demographics

Steps to update

1. Log into TabCAT. Close any open encounters.
2. Sync all data. You must be connected to Wi-Fi to sync data. A Study Admin or Clinical Trial Study Admin user may sync all data from their study on an iPad, even if the data was collected by another user. Examiners may only sync data that they collected.
3. Once all data is synced, delete the old TabCAT app from your iPad. Installing the newest update may not work correctly unless the old app is deleted. If data does not sync before deleting the old app, that data will be lost. Please ensure all data syncs successfully before deleting.
4. Follow the same instructions for Installing TabCAT.

THE ADMIN PANEL

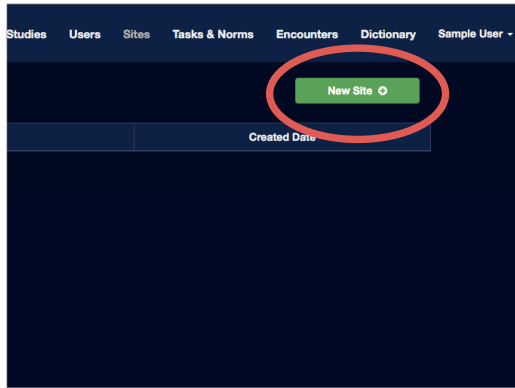## The Admin Panel

The Administrative Website, or "Admin Panel" is a hub for managing use of the TabCAT application. Access the Admin Panel at https://mac.ucsf.edu/.

Log in using the same credentials that you use to log in to the TabCAT application.
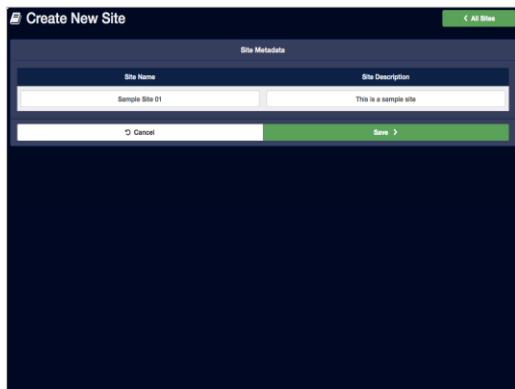
Sites

A site refers to a location, such as research center or clinic, where data may be collected as part of a study. For some users, Site access will limit Study data visibility.

Create a new site

1. Select "Sites" from the Admin Panel tab menu. You will see a list of all sites in your realm.
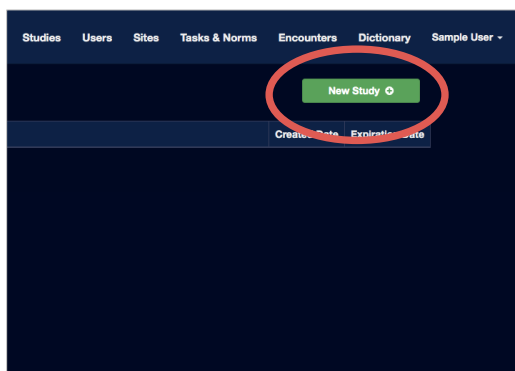2. Select "New Site".

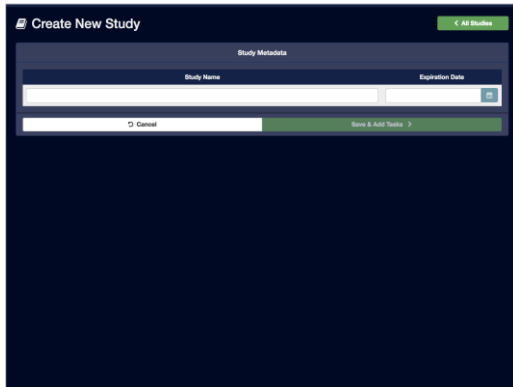3. Enter the site name and site description.
4. Select "Save".

Studies

A study refers to a grouping of tasks that have their own data repository in the realm's database. A study may collect data at multiple sites.
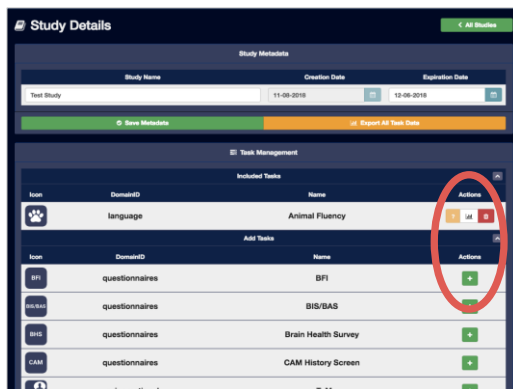
Create a new study

1. Select "Studies" from the Admin Panel tab menu.
2. Select "New Study".

3. Enter your study name and expiration date. The expiration date is added for your convenience and can be changed if needed. The date inputted will not affect your data.
4. Select "Save & Add Tasks".

Add tasks to a study

Adding tasks to a study makes the tasks available for use on the TabCAT application for that specific study. If a task is not added to a study, it will not be available on the application for use on that study.
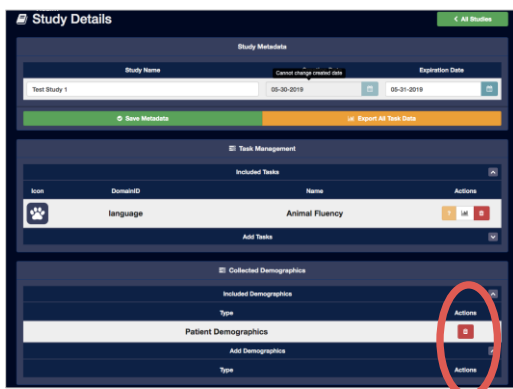

1. From your study page, scroll to the "Task Management" list and select "Add Tasks".
2. Choose the tasks you would like to incorporate into your study by clicking the green plus sign icon next to the task name.
3. Remove tasks from your study by clicking the red trash bin icon next to the task name.

Add Patient Demographics to a study

Collection of Patient Demographics is optional. If Patient Demographics are added to a study, a prompt will appear on the TabCAT application for each encounter that allows the examiner to enter any or all of the following fields: First Name, Last Name, Date of Birth, Preferred Language, Gender, and Handedness. If Patient Demographics are not added to a study, this prompt will not appear.

Some Patient Demographics fields are required for TabCAT to perform automatic scoring comparisons to available normative data. Patient Demographics may contain protected health information (PHI) about your subjects and should be used with appropriate caution.

1. From your study page, scroll to the "Collected Demographics" list and select "Add Demographics".
2. Choose the demographics you would like to incorporate into your study by clicking the green plus sign icon next to the demographics name.
3. Remove demographics from your study by clicking the red trash bin icon next to the demographics name.

Add Sites to a study

When sites are added to a study, users linked to that study-site combination are also given access to the study.
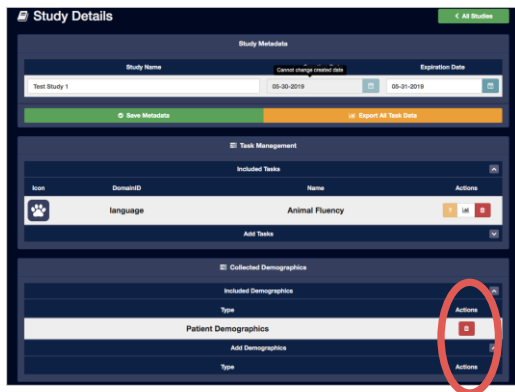
1. From your study page, scroll to the "Site & Access Management" list and select "Add Sites".
2. Choose the sites you would like to incorporate into your study by clicking the green plus sign icon next to the site name.
3. Remove sites from your study by clicking the red trash bin icon next to the site name.

Add Reports to a study

Summary Reports are designed to provide a text-based summary of the subject's performance on certain TabCAT tasks. Currently there is one Report available: The UCSF Brain Health Assessment Summary Report for Neurology. This report is intended for use by Neurologists who are testing with the Brain Health Assessment battery. For more information, please contact tabcat@ucsf.edu.
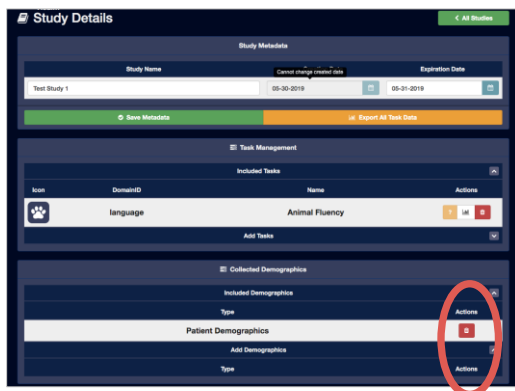
1. From your study page, scroll to the "Site & Access Management" list and select "Add Sites".
2. Choose the sites you would like to incorporate into your study by clicking the green plus sign icon next to the site name.
3. Remove sites from your study by clicking the red trash bin icon next to the site name.
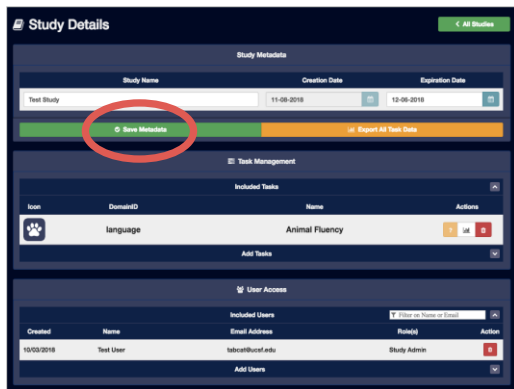
Download study data

After users sync data from the TabCAT application, it will be available for download from the Admin Panel.
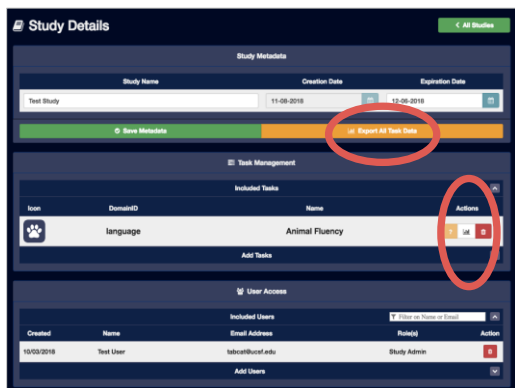
1. To download all study data in one file, select "Export All Task Data" near the top of your study page.
2. To download data for one task at a time, scroll to the "Included Tasks" list. Select the graph icon next to each test.
3. Open the Downloads folder on your computer to find the downloaded report.
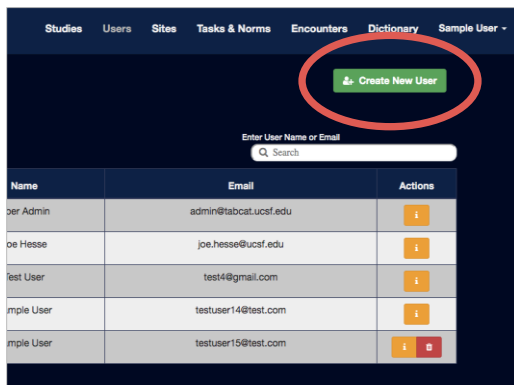
Edit study details

1. To edit your study's name, type directly into the "Study Name" box and save by selecting "Save Metadata".
2. To edit your study's expiration date, click on the calendar icon next to "Expiration Date" and choose a new date. Save by selecting "Save Metadata".
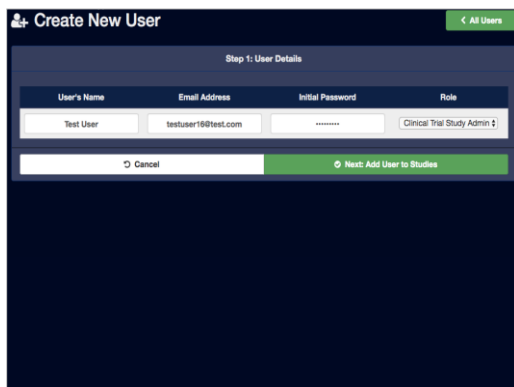
Users

A user is assigned to a realm, and to sites and studies within the realm, allowing them to manage their study and/or collect data on the application. Each user is assigned a role: System Admin, Realm Admin, Study Admin, Clinician, Clinical Trial Study Admin, or Examiner.
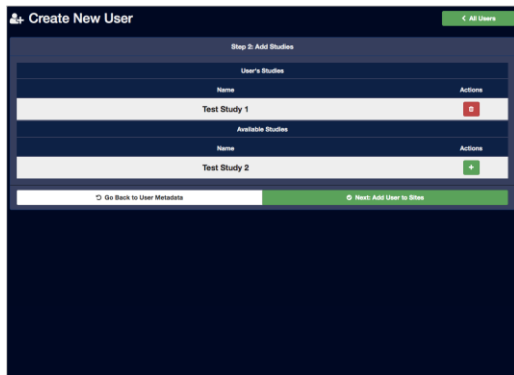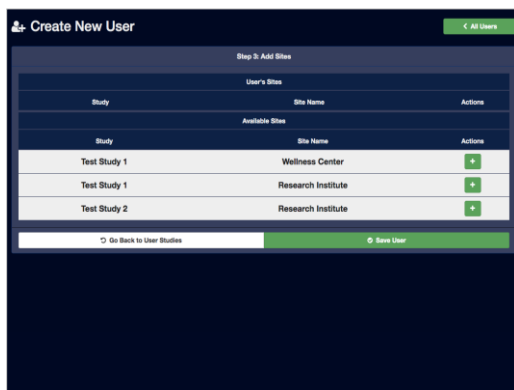
Create a new user

1. Select "Users" from the Admin Panel tab menu.
2. Select "Create New User".

3. Enter the new user's first and last name, in the format "Firstname Lastname".
4. Enter the user's email address, which will act as their username.
5. Under "Initial Password", give the new user a generic, yet complex, password. The user can change their password to something personal when they log on to the Admin Panel.
6. Specify the new user's role. To view permissions level details for each role, please see "TabCAT: System". Permissions for your role will restrict you from creating any users with higher level permissions than you.
7. Select "Next: Add User to Studies" to continue.

8. Choose the studies you would like to give the user access to by clicking the green plus sign icon next to the study name.
9. Revoke access from studies by clicking the red trash bin icon next to the study name.
10. Select "Next: Add User to Sites" to continue.

11. Choose the study-site combination you would like to give the user access to by clicking the green plus sign icon next to the site-study combination name. If the user being created is a Study Admin, Realm Admin, or System Admin, they will be automatically added to all sites within the studies they have been given access to.
12. Revoke access from study-site combinations by clicking the red trash bin icon next to the study-site combination name.
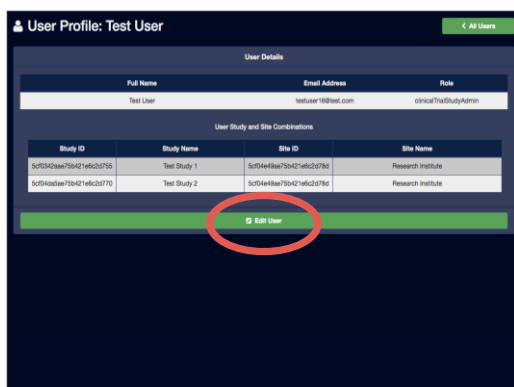13. Select "Save User" to save.

View and edit user details

View and edit a user's role and assigned access to study-site combinations.

1. From the "Users" tab, search for or scroll to the desired user.
2. Click the yellow "i" icon under "Actions".
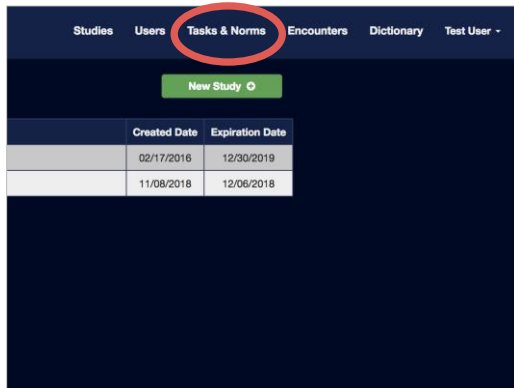
3. View the user's profile information, as well as the study-site combinations that the user has access to.
4. If you are a Study Admin, Realm Admin, or System Admin, you may edit the user's information. Select "Edit User" to edit.
5. Follow the instructions for "Create a new user" to edit the study-site combinations that the user has access to.

Tasks & Norms

Some tasks have normative data that can be used to contextualize a patient's performance.

View task details and normative data

6. Select "Tasks & Norms" from the Admin Panel tab menu.
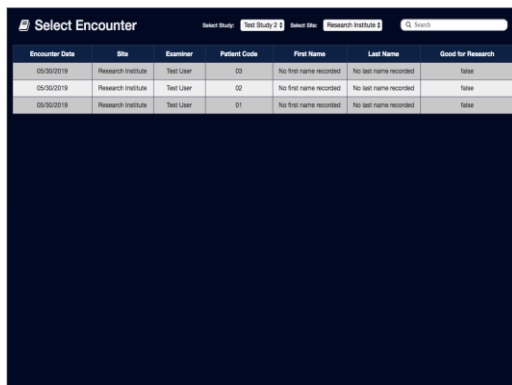
7. Select a task to view normative data if available.

Encounters

Each synced encounter, including metadata, patient and informant demographics, and task results, can be viewed individually on the Admin Panel, without the need to download data in a separate file.

View encounters in a study

1. Select "Encounters" from the Admin Panel tab menu.
2. Select your study from the first drop-down menu at the top of the page. You will only see studies that you have access to in the realm.
3. Select the site you are interested in from the second drop-down menu at the top of the page.
   If you are a Study Admin, Realm Admin, or System Admin, you will see all sites in the chosen study. If you are a Clinician or Clinical Trial Study Admin, you will only see the sites that you have access to within the chosen study.
   "All" will show encounters from all sites that you have access to.

4. Sort the encounters by clicking on any of the column headers, or search for an encounter by using the search bar.

5. Select an encounter to view encounter metadata, patient and informant demographics, and task results.

6. Questionnaire responses can be viewed by tapping on the small icon next to the task name. Scroll down on the pop-up to view additional responses.
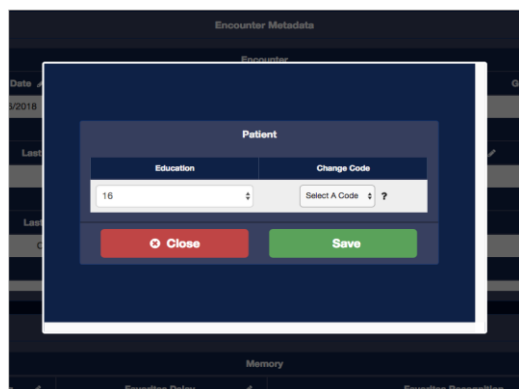

Edit encounter data

Data from synced encounters, including encounter metadata, patient and informant demographics, and results from certain tasks, can be edited.

1. From your study's encounter page, select the desired encounter.
2. Select the pencil icon next to the field name of the data you wish to edit.

3. Enter the corrected data.
4. Select a change code. The change chode represents the reason that the data is being edited. Hover your mouse over the "?" icon to view the definition of each change code, or refer to the table below.
5. Select "Save". Edited data will be reflected in the current data download.
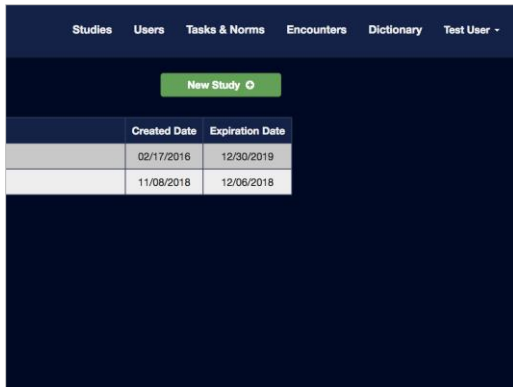
Edit encounter data: Change Code reference table

Change Code	Description
Comment_01	The User entered in the Comments that there was a problem with administration resulting in invalid data. Therefore, this data is not to be used and Good For Research changed to reflect FALSE.
Comment_02	The User incorrectly entered Encounter administration comments. The changed value reflects the correct Encounter administration comments.
Other	The User has made a change that is not listed in the above change codes. The User is to specify their reason for making the alteration using the required free-text field.
PatientCode_01	The User incorrectly entered the PatientCode for the Encounter, due to the following reasons: 1) the format of the PatientCode name/number is incorrect, 2) the PatientCode name/number is missing, 3) the PatientCode name/number is invalid according to the Study. The changed value reflects the correct PatientCode.
PatientCode_02	The User incorrectly entered the demo/invalid PatientCode for the Encounter as a usable/valid PatientCode, instead of a demo/invalid code, according to the Study. The changed value reflects the correct PatientCode.
PatientCode_03	The User incorrectly entered the usable/valid PatientCode for the Encounter as a demo/invalid PatientCode, instead of a usable/valid code, according to the Study. The changed value reflects the correct PatientCode.
Results_01	The User incorrectly entered demographic data or task data. The changed value reflects the correct demographic data or task data.
Site_01	The User incorrectly entered the Site for the Encounter, due to the following reasons: 1) the format of the site name/number is incorrect, 2) the site name/number is missing, 3) the Site name/number is invalid according to the Study. The changed value reflects the correct Site.
ValidData_01	The User incorrectly marked the Encounter data as "Good for Research – TRUE" (usable/valid), instead of "Good for Research – FALSE" (unusable/invalid). The changed value reflects the correct Encounter data status.
ValidData_02	The User incorrectly marked the Encounter data as "Good for Research – FALSE" (unusable/invalid), instead of "Good for Research – TRUE" (usable/valid). The changed value reflects the correct Encounter data status.

Dictionary

Data dictionaries that correspond to the downloadable task data are available for reference on the Admin Panel.

View data dictionaries
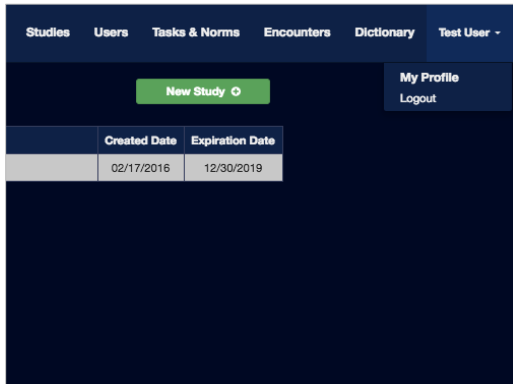
1. Select "Dictionary" from the Admin Panel tab menu.
2. Select the task of interest, or scroll to view each task's data dictionary.
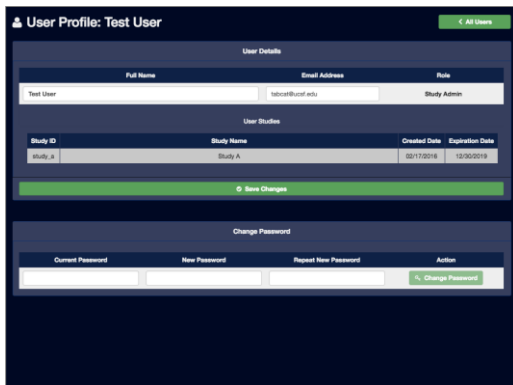
My Profile

Edit the username, email address, or password associated with your TabCAT account.

1. Select your name from the top right-hand corner of the Admin Panel menu.
2. Select "My Profile" from the drop-down menu.

3. Type in your new username, email address, or password. Passwords must have a minimum of 7 characters, and must include at least one of each of the following kinds of characters: upper case, lower case, number, symbol.
4. Save changes.

THE TABCAT APPLICATION

Create an Encounter

Create an encounter on the TabCAT application for each study participant or patient, allowing you to administer tasks and store data.
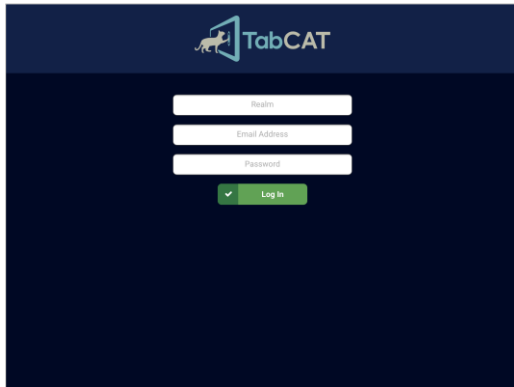
1. Log in to TabCAT using your realm, email address, and password.

   Notes about log-in:
   - The user that logs in should be the same user that will be administering tasks to the participant or patient.
   - Wi-Fi connection is no longer required for login, but login without a Wi-Fi connection does not guarantee up-to-date user and study details on the application. Log in while connected to Wi-Fi to ensure all details are up-to-date.
   - Four failed login attempts will result in a temporary lock-out.
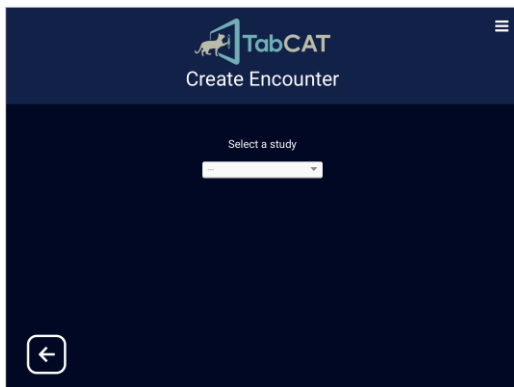
2. Under "Select a study", choose the study through which you will be collecting data. You will only see names of studies you have been given access to on the Administration Panel website.
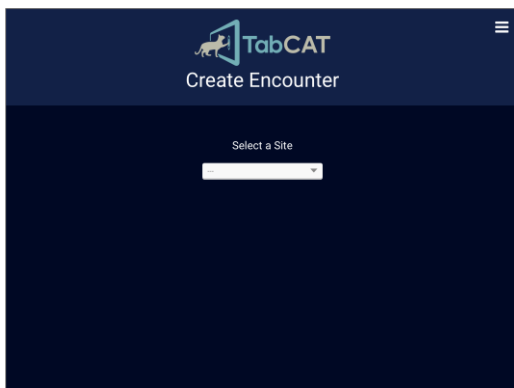
3. Under "Select a Site", choose the site where you are testing. You will only see names of sites you have been given access to for the study chosen.
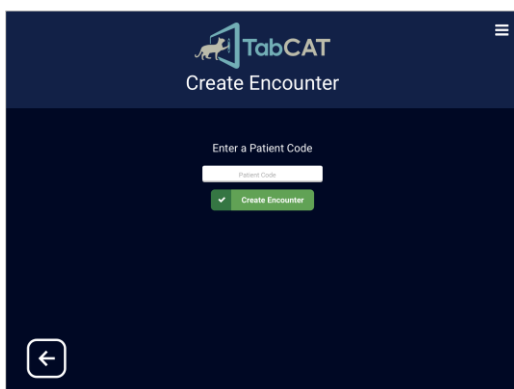
4. Under "Enter a Patient Code", type a unique identification code for your participant or patient. If you are creating a fake encounter for the purposes of training, use the patient code "0".

5. Start testing by tapping "Create Encounter".
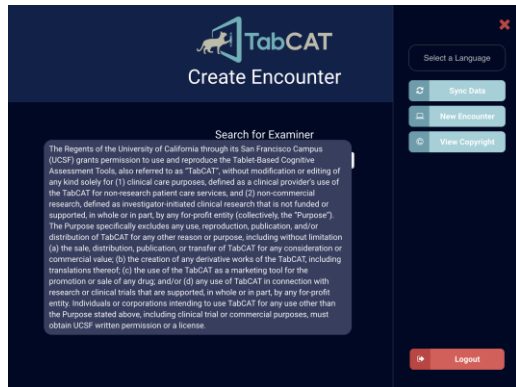
6. The first time that TabCAT is accessed by a new user or after new installation, an important copyright statement will appear. Please read the copyright statement carefully and agree before continuing application use.
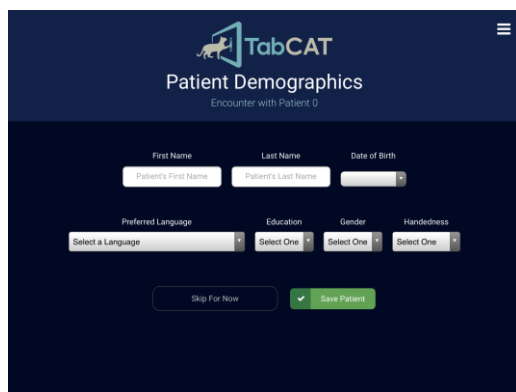
7. If added to your study, TabCAT will ask for Patient Demographics. Enter the patient's demographic information and select "Save Patient". Some of this information must be entered to enable comparative scoring of the cognitive tests.
Note: "Preferred Language" refers to the language that the subject prefers to be tested in. It does not change the testing language of TabCAT or affect normative comparisons.

If Patient Demographics are not added to your study, you will not see this page.

Administer Tasks

The Task Selection Screen
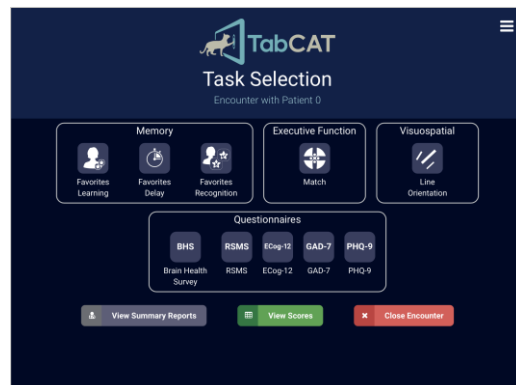
The Task Selection screen is the home page for your encounter and contains all tasks in your study.
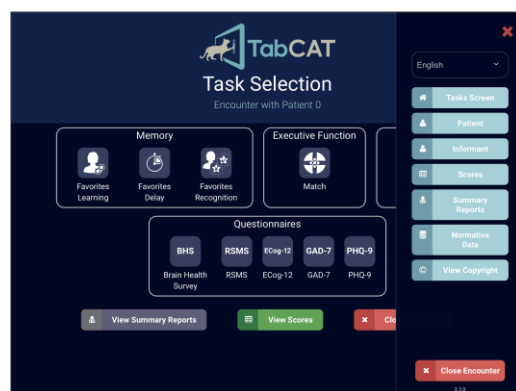
Tap on the menu icon in the upper right-hand corner to view additional encounter details.

Change task language

Change the language of tasks with available translations. The Task Selection Screen will always appear in English. All tasks with available translations will appear in your chosen language when opened. If a task does not have a translation it will appear in English.
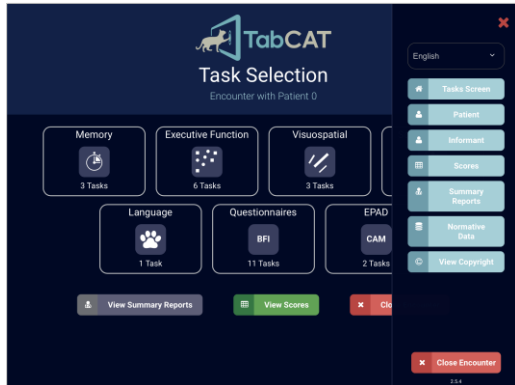
1. Open the sidebar menu.
2. Tap on the language bar.
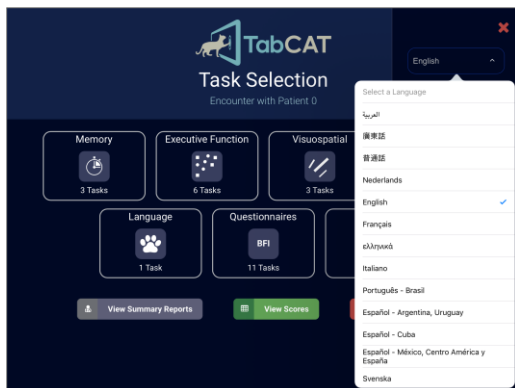
3. Select a language.

Force-close a task

You may wish to force-close a task before it is complete for various reasons, including opening the wrong task or form accidentally or testing with a participant who is unable to complete the task. If you choose to force-close a task, any data collected within that task will not be saved.
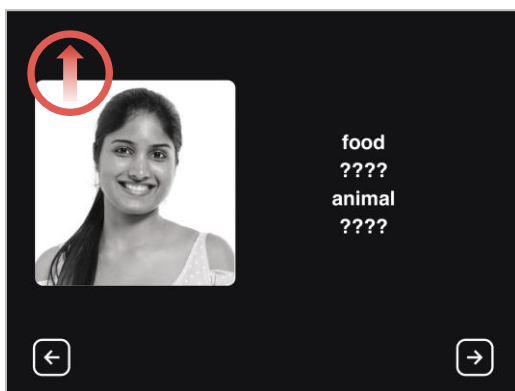
Method 1
1. Use your finger to swipe upward in the top left corner of the screen. You may need to swipe several times in different locations as the force-close button is hidden from view.
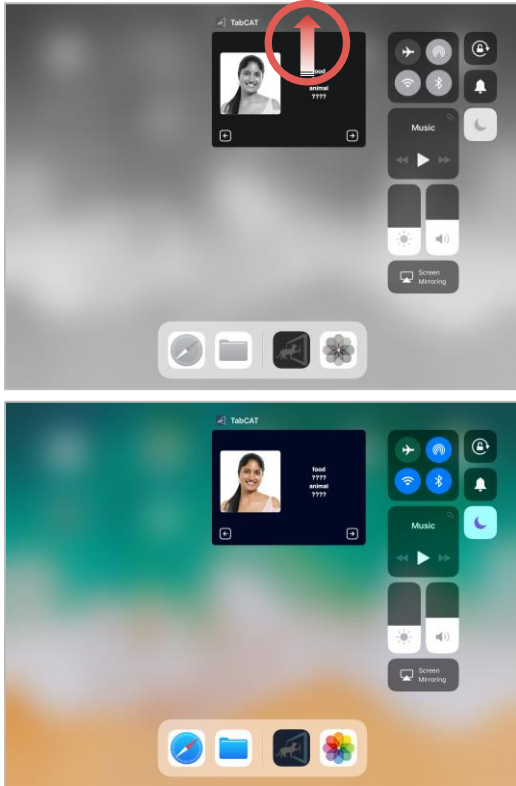
Method 2
1. Double-click the iPad Home button to display all open applications.
2. Touch and hold the TabCAT application window, and drag it upward until it disappears.
3. Click the iPad Home button.
4. Open TabCAT.

View Scores

View task scores

When a task is completed, a green check mark will display over the task icon.
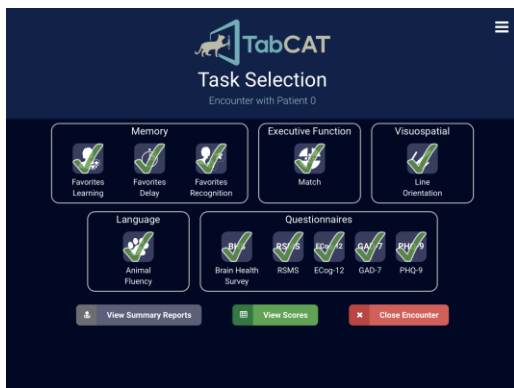
1. Tap "View Scores" on the Task Selection screen, or the sidebar menu.

2. Scroll to view encounter metadata, patient and informant demographic information, and testing results. Questionnaire results can be viewed by tapping the small icon next to the questionnaire name. Scroll to view additional results.

If a patient's demographic information is completed and can be compared to normative data available for a particular task, there will be multiple scores visible on the Encounter Scores page. The first score is the patient's score. The second scores are the mean and standard deviation scores of the normative sample the patient is comparable to. The bottom score is the patient's percentile rank as compared to that normative sample.

View normative data

View available normative data for the tasks in your study directly from the TabCAT application.

1. Tap "Normative Data" on the sidebar menu.
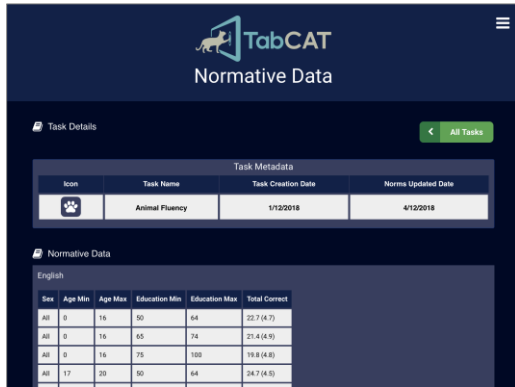
2. Tap a task name to view normative data for that task.

Close an Encounter

After completing all testing, the encounter must be closed in order to save data.

1. Tap "Close Encounter" on the Task Selection screen, or the sidebar menu.
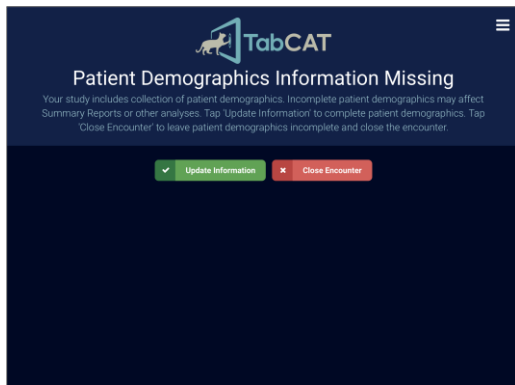
2. You may be prompted to complete patient demographic information if added to your study and incomplete at the time of encounter close. If you would like to proceed without completing patient demographic information, continue to close the encounter. Otherwise, tap "Update Information".
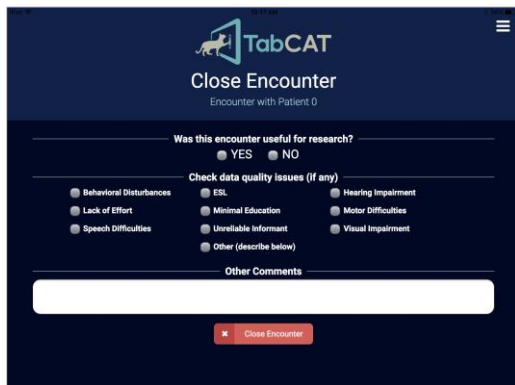
3. You will be prompted to indicate if the data were useful for research. This can also be understood as asking if the data were valid (i.e., there were no issues during testing that would invalidate the data). If the encounter was created as part of training or for exploring features of TabCAT, select "No".
4. Add any data quality issues or administrative comments about the encounter. This is optional.
5. Select "Close Encounter".

Sync Data

All data must be synced manually. Syncing transports data to the TabCAT server so that it can be viewed and downloaded from the Admin Panel. Once data is synced it is erased from local iPad storage.

It is good practice to sync data after every encounter. Failure to do so could result in accidental data loss.
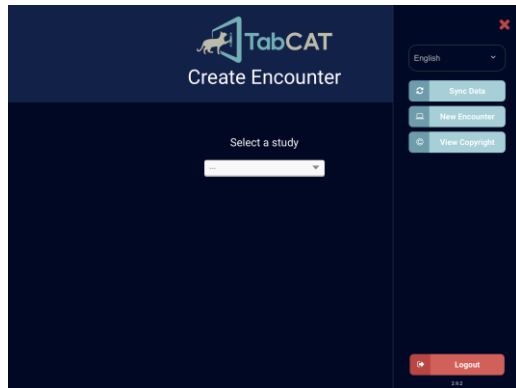
	1. Ensure the iPad is connected to Wi-Fi. 2. Tap "Sync Data" from the sidebar menu.
	3. Log in using your TabCAT credentials. 4. Tap "Log In".
	5. You will see a screen that confirms encounters that will be synced. Tap "Sync" to confirm and proceed.
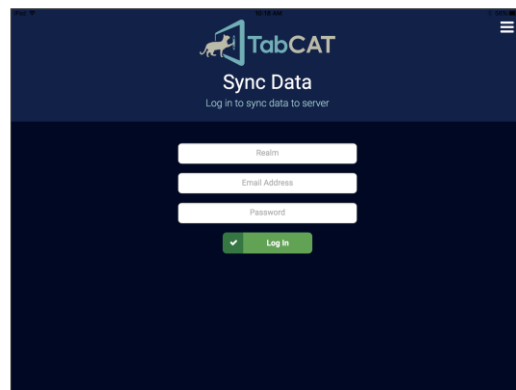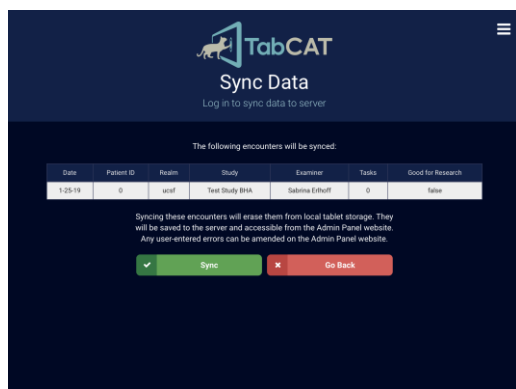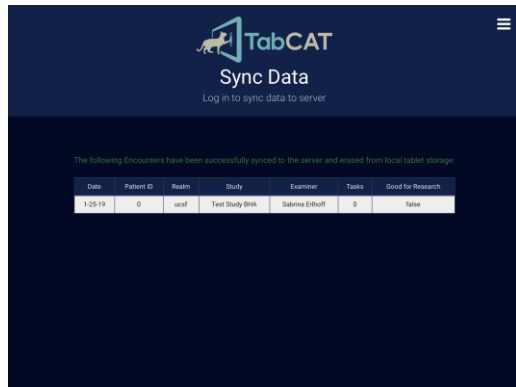
6. You will see a screen that confirms the sync was successful. This may take a few moments.
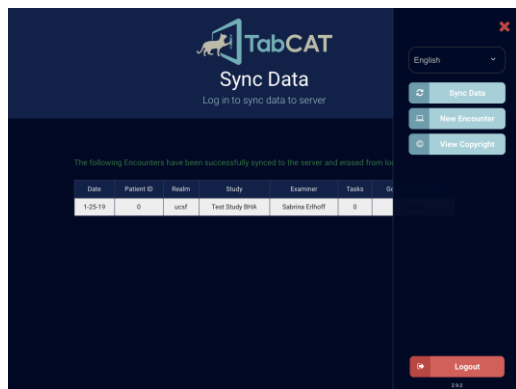
7. Tap "Log Out" from the sidebar menu. Failure to log out after syncing may result in a failed data sync in the future.
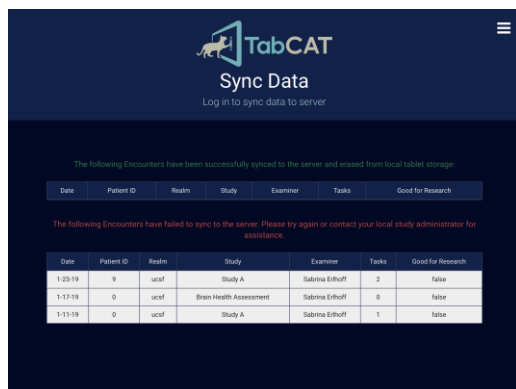
8. Should you ever see red text that reads "Data Sync Error",
    i. Log out of TabCAT using the sidebar menu.
    ii. Open iPad settings and disconnect from Wi-Fi. Wait 15 seconds, then connect to Wi-Fi again.
    iii. Log in to TabCAT.
    iv. Attempt to sync data again.

TASKS

Global Considerations*

Before Beginning

Before beginning a testing session, organize your materials so you can easily move from one task to another.

Do your best to minimize factors that can affect the patient's performance (e.g., extraneous noises, poor lighting, anxiety, low motivation).

Take time to establish rapport with the patient at the beginning of the test session. Family members should not be present in the room during an evaluation.

The optimal seating arrangement is to be across the testing table from the patient, or sitting to the patient's right. This allows you to advance the tablet screens without blocking the patient's view of the screen.

Give the patient a brief and very general overview of what the testing will entail.

During Testing

Instructions should be read verbatim. Do not paraphrase unless necessary. Should the patient have difficulties understanding the instructions, it is permissible to explain the task to them in another fashion (while maintaining the basic concept of the instructions); however, you should always read the verbatim instructions first.

Always try to elicit the patient's best performance. Encouraging remarks are important, but do not provide specific feedback regarding whether individual responses are correct or incorrect, except during practice trials. If the patient seems discouraged or anxious about his or her performance, encouraging remarks like "I can tell you are trying your best," "No one gets all of these correct," or "That was a tough one for you, but you did it" are often helpful. If the patient's motivation wanes, it is okay to explain in general terms what the task is trying to measure (e.g., "This is a measure of a particular kind of attention").

Provide breaks when needed. Examiners should pay attention to the patient's motivation, emotional state, physical discomfort, and other factors that potentially compromise test validity.

Many of the tasks have discontinuation rules. For those that do not, please attempt to complete all tasks whenever possible.

If the patient refuses to complete a task, and kind, validating encouragement does not change their mind, force-close the task and make a note on your study materials. Ask the patient if they would like to continue with a different task.

*Global Considerations taken from NIH EXAMINER Manual, edited for relevance

Task List

Memory

Favorites Learning: measures immediate associative verbal and visual memory.

Favorites Delay: measures delayed associative verbal and visual memory.

Favorites Recognition: measures associative verbal and visual memory via a cued recognition assessment after a delay.

Executive & Speed

Match: measures processing speed and associative memory and is modeled after the WAIS-III Digit Symbol Coding paradigm.

Dot Counting: measures working memory skills and is modeled after NIH EXAMINER Dot Counting.

Flanker: measures inhibition skills and is modeled after NIH EXAMINER Flanker.

Set Shifting: measures set shifting skills and is modeled after NIH EXAMINER Set Shifting.

Timing: measures subjective time estimation.

Running Dots: measures spatial working memory. Patients watch a series of dots appear and disappear from a screen one by one, then recall the last 2–5 locations where a dot appeared, depending on the condition.

Visuospatial

Line Orientation: measures visuospatial skills and is modeled after the Benton Judgement of Line Orientation task.

Line Length: measures visuospatial skills and is may be a more accessible alternative to "Line Orientation" for patients with language-related difficulties.

Perpendicular Line Length: measures visuospatial skills and is may be a more accessible alternative to "Line Orientation" for patients with language-related difficulties.

Language

Animal Fluency: measures categorical verbal fluency. Patients are asked to name as many animals as they can in 1 minute.

Rapid Naming: measures object naming and semantic knowledge.

Spatial Memory

Four Mountains: measures hippocampal spatial recognition for places where viewpoint or surface features may change. It was devised by Dr. Tom Hartley at the University of York.

Supermarket: measures navigational orientation in a video-based virtual supermarket. It was devised by Dr. Michael Hornberger at the University of East Anglia.

Socioemotional

Dynamic Affect Recognition Test (DART): measures emotion recognition in a dynamic context. Patients are asked to name realistic emotional expressions from video-based, ecologically valid stimuli.

Emotional Theory of Mind (eToM): measures the patient's ability to represent mental states of others. Patients are asked to identify first and second order emotion knowledge of characters from video interactions.

Cognitive Theory of Mind (cToM): measures the patient's knowledge about someone else's beliefs. Patients are asked to identify first and second order belief knowledge of characters from video interactions.

Social Interaction Vocabulary Task (SIVT): measures semantic knowledge of social interactions. It is formatted as a multiple-choice picture/word socioemotional vocabulary matching task.

Social Display Rules (SDR): measures knowledge of social norms around emotional displays. The patient is asked to match written scenarios to pictures of emotional faces.

Humor: measures humor comprehension. Patients are asked to select the funniest ending to an incomplete comic strip.

Moral Reasoning: measures moral reasoning skills. Patients select multiple-choice responses to written moral scenarios.

Questionnaires

Big Five Inventory (BFI): an informant-facing questionnaire that measures socioemotional traits via a multidimensional personality inventory based on the Big 5.

Brain Health Survey (BHS): an informant-facing questionnaire that evaluates neurocognitive symptoms.

Social Norms Questionnaire (SNQ): a patient-facing questionnaire that measures socioemotional functioning via semantic knowledge of mainstream US social norms.

Revised Self Monitoring Scale (RSMS): an informant-facing questionnaire that measures socioemotional functioning via trait sensitivity and responsiveness to others' subtle emotional expressions (i.e. online social intuition in face-to-face interactions).

Social Behavior Observer Checklist (SBOCL): a clinician or examiner-facing questionnaire that measures socioemotional behavior via observed, spontaneous social behaviors enacted by the participant during the course of an evaluation (e.g., cognitive testing session, interview, or exam).

Behavioral Inhibition/Behavioral Activation System (BIS/BAS): an informant-facing questionnaire that measures socioemotional functioning. It is formatted as a multiple-choice measure of approach/avoidant traits and reward/punishment sensitivity and anxiety.

Interpersonal Reactivity Index (IRI): an informant-facing questionnaire that measures socioemotional functioning via observed trait cognitive and emotional empathy.

Personal Competency Rating Scale (PCRS): an informant-facing questionnaire that may additionally be administered to the patient if a measure of insight is desired. The survey measures functional impairment, as the informant is asked to judge the patient's ability to perform a variety of practical skills.

Everyday Cognition, 12 Item (ECog-12): a 12-item informant-facing questionnaire that measures cognitive and functional change in the patient over the last 5 years.

Generalized Anxiety Disorder Assessment, 7 Item (GAD-7): a 7-item patient-facing questionnaire that may detect and measure severity of generalized anxiety disorder.

Patient Health Questionnaire, 9 Item (PHQ-9): a 9-item patient-facing questionnaire that may detect and measure severity of depression

COGNITIVE BATTERIES

Brain Health Assessment

The Brain Health Assessment (BHA) is a brief 10-minute cognitive assessment designed to be sensitive to mild cognitive impairment and to provide valid subscores to support differential diagnosis in primary care.

Separate efficient tests evaluate memory (Favorites), executive functioning (Match), visuospatial skills (Line Orientation), and language (Animal Fluency).

An informant questionnaire evaluates for symptoms of neurocognitive disorders. It includes Brain Health Survey, comprised of the ECog-12 (Farias) as well as 9 additional questions to target less typical presentations.

The BHA will soon include automated reports and EPIC integration.

APPENDIX 1: UPDATE HISTORY

Update history

Improvements made in v2.3.0, *05 Jan 2018*
Application

- Translation adjustments and additions for Cantonese, Spanish (all), French, Italian, and Portuguese
- Several edits to new socioemotional tasks
- Integration of Patient Demographics

Admin Panel
- Stricter permissions criteria for Examiner and Study Admin roles
- Fixed a bug where trial time data was displaying incorrectly for Line Orientation, Line Length, and Perpendicular Line Length tasks

Improvements made in v2.4.0, *05 Feb 2018*

Application
- Integration of a new Task Selection Screen layout
- Integration of new tasks and questionnaires: Animal Fluency, ECog-12, GAD-7, and PHQ-9
- Integration of Informant Demographics
- Integration of Encounter Scores page that allows users to view task and questionnaire results all in one page.

Admin Panel
- Stricter permissions criteria for Examiner and Study Admin Roles

Improvements made in v2.5.0, *05 Mar 2018*

Application
- Ability to view Normative Data for tasks
- Ability to view patient results as compared to normative data on the Encounter Scores page. After completing patient demographics and completing tasks, view the patient's score, the mean and standard deviation scores for the patient's normative group (if available), and the patient's percentile ranking as compared to their normative group (if available)
- Stricter permissions criteria for the Examiner role
- Edits to the Informant Demographics page

Admin Panel
- Ability to view Normative Data on the Tasks and Norms tab
- Ability to view Informant Demographics on informant questionnaire results
- Search for users and view user roles on the Users and Studies tabs

Improvements made in v2.5.1, *06 Apr 2018*

Application
- Translations for all available language names on the language selection menu
- Refinements to login error messages and addition of lock-out functionality after failed login attempts
- Addition of Arabic translations for various tasks
- Edits to Running Dots and Brain Health Survey

Admin Panel
- Edits to Data Dictionaries

Improvements made in v2.6.0, *15 Apr 2018*

Application
- Refined data syncing process
- Disabled ability to sync data or log out during an open encounter

Admin Panel
- New user role added: Clinician

Improvements made in v2.7.1, *09 Aug 2018*

Application
- Several bug fixes for data syncing issues

Improvements made in v2.8.0, *30 Oct 2018*

Application
- Addition of an inactivity timer that prompts users to reauthenticate after 10 minutes of inactivity
- Ability to authenticate while off-line
- New tasks: Four Mountains and Supermarket
- Addition of visible navigation and scoring validation to Dot Counting task
- Fixed a bug where Encounter dates were displaying 1 day off
- Fixed a bug where the Spanish Brain Health Survey caused a crash

Admin Panel
- Addition of the Encounters tab, which allows users to view encounter metadata, demographics, and results without downloading data, as well as edit data.
- Ability to separate studies into their own realms
- Ability to download all study data at once in one, denormalized result file
- New user role added: Clinical Trial Study Admin
- Addition of access and change event logs for recording all user activity on TabCAT

Improvements made in v2.9.2, *25 Jan 2019*

Application
- Fixed a bug that blocked authentication processes, related to the inactivity timer
- Increased the inactivity timer to 20 minutes
- Fixed a bug that caused some buttons on the task screen to disappear
- Addition of a new feature that describes each encounter completed upon syncing
- Fixed a bug that caused username to be case-sensitive upon authentication

Admin Panel
- Fixed a bug that caused username to be case-sensitive upon authentication
- Fixed a bug that caused Flanker result download to be blocked
- Fixed a bug that caused Encounter Scores to show incompletely

Improvements made in v2.9.6, *8 Apr 2019*

Application
- New task: Rapid Naming (Language)
- Improvements to Favorites Learning, Line Orientation, Line Length, and Perpendicular Line Length instructions pages
- Shortened the Line Orientation, Line Length, and Perpendicular Line Length tests
- Fixed a bug where the patient demographics language selections were not displaying correctly
- New translation: Turkish (Favorites Learning, Favorites Delay, Favorites Recognition, BHS, Animal Fluency, Line Orientation, Line Length, Perpendicular Line Length, Match)
- Updated translation: Arabic
- Updated normative comparisons so that they estimate a patient's closest reference group

Admin Panel
- Updated several items to keep the TabCAT database and Admin Panel running smoothly
- Added a new variable to Favorites Recognition: D Prime
- Updated Patient and Informant Demographics pages

APPENDIX 2: HELP

Frequently Asked Questions

Please reference the solutions to these common issues before contacting TabCAT administrators.

Installing TabCAT

Problem	Solution
When I attempt to install the TabCAT application onto the iPad, I see a pop-up from Apple that reads, "The application 'TabCAT' cannot be downloaded at this time".	1. If there is an older version of TabCAT already installed: • Sync all data on the old version of TabCAT. • Delete the old TabCAT application from the iPad. • Attempt to install the new version of TabCAT again. 2. If there is no version of TabCAT already installed: • Shut down and restart the iPad completely. • Ensure the iPad has an up-to-date iOS and a strong connection to a Wi-Fi network. • Attempt to install the new version of TabCAT again.

| I installed TabCAT onto my iPad, but when I try to open TabCAT, I see a pop-up from Apple that reads, "Untrusted Network Developer". | 1. Open iPad Settings.
2. Select "General", then "Profiles and Device Management" (or "Device Management").
3. Select "University of California, San Francisco"
4. Select "Trust". |
| When I try to log in to TabCAT, a TabCAT error reads, "Cannot Connect to TabCAT Server". | 1. Ensure strong connection to a Wi-Fi network on the iPad.
2. Ensure that the realm, email address, and password are all being entered correctly. |

The TabCAT Application

Problem	Solution

When I try to log in to TabCAT, a TabCAT error says "Incorrect Realm, Email Address, or Password".	1. Ensure that the realm, email address, and password are being entered correctly. Check if the login works on the Admin Panel website.
	2. If the login does not work on the Admin Panel website,
	  • Reset the password using the Admin Panel website.
	  • Attempt to log in on both the iPad and the Admin Panel again.
	3. If the login does work on the Admin Panel website,
	  • Ensure strong connection to a Wi-Fi network on the iPad.
	  • Ensure that the realm, email address, and password are being entered into the tablet correctly.
	4. If still having trouble,
	  • Ensure that the most up-to-date version of TabCAT (production) is being used.
	  • Delete and re-download the TabCAT application.

After attempting to sync data, there is a delay where the screen appears to freeze.	1. Ensure strong connection to a Wi-Fi network on the iPad and attempt to sync again by tapping the sidebar menu icon in the upper right-hand corner of the screen and selecting "Sync Data".
	2. Syncing can sometimes take up to 1 minute. If there is still a delay, ask a user with Study Admin credentials to attempt to sync data.
	3. If still unsuccessful,
	  • Log out of TabCAT, and log in again.
	  • Create a fake patient encounter, complete a task, and close the encounter (be sure to select NOT good for research when closing the encounter).
	  • Attempt to sync again.

After syncing data, some encounter data appears in red print, indicating that the sync was wholly or partially unsuccessful.	1. Ensure strong connection to a Wi-Fi network on the iPad and attempt to sync again by tapping the sidebar menu icon in the upper right-hand corner of the screen and selecting "Sync Data". 2. Ask a user with Study Admin credentials to attempt to sync data. 3. Ask a user with Study Admin credentials to check the data reports on the Admin Panel. If the failed data is missing, please report to UCSF.

Contact

If you experience any problems while using TabCAT, please check to see if the solution is featured in the FAQ page first. If you cannot find a solution, or encounter a malfunction while using TabCAT, please pay careful attention to the malfunction and document as much as you can. This will help our troubleshooting team solve the issue as quickly and as efficiently as possible. Please contact tabcat@ucsf.edu with the subject line "TabCAT Troubleshooting: FirstName LastName", using your name, and include the following information:

• The iPad model or model number and the iPad iOS installed at the time of the problem.
• The TabCAT version number installed at the time of the problem, or the date of your last update.
• A description of the problem and circumstances during which the problem occurred in as much detail as possible.
• If applicable, a screenshot of the iPad screen showing the bug or error message. Screenshots of the iPad can be taken by simultaneously pressing the Home button and the Sleep/Wake button on the iPad. The screenshot can then be found in the Photos app; from there they can be attached to an email.