FCS Health Project

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1 Project Summary

Electronic Medical Record (EMR) software is aimed to assist medical practitioners in the formation, storage, and organization of patient records. Often including charts, prescriptions, evaluations, and all pertinent demographic information. Switching from paper records to EMR provides major business value by increasing efficiency and reducing costs.

Family Counseling Services of Northern Utah (FCS) has been providing low cost mental health care to the community for a half-century. The operation is only sustainable by maintaining an extraordinary level of efficiency. Weber State University Computer Science Department will provide a critical benefit to FCS by implementing an open source EMR solution.

“OpenEMR is a free and open source electronic health records and medical practice management application” their website, www.open-emr.org, reads. This system will address many needs of FCS: tracking client demographics, appointments, and care. The following will document the client’s needs and how to address them using OpenEMR.

2 Project Description

2.1 Customer Need

The client, FCS, needs to separate themselves from the paper based information system they are currently using. That separation will be facilitated through the implementation of the FCS Health Project. First and foremost the software needs to track client data:

- Name
- Age
- Gender
- Language and ethnicity
- Marital status
- Social Security Number (SSN)
- Contact Information
- HIPAA information
- Billing information

- Insurance information
- Income
- If the client is marked for collections
- If the client is head of household.

All the data points must be stored and queryable for report generation. Access to data and functionality should be limited using the guidelines detailed in the use case diagram below. Further, FCS would greatly benefit from an implementation of the following:

- Tracking appointments
    - Scheduling, visually, using a calendar including therapist availability[1]
        - Email reminders to therapist and patient one week prior to appointment
    - Historical appointment data
    - Every eighth appointment needs to send an email reminder to the administrator to determine if treatment should continue
- Tracking encounters
    - Historical and current diagnostic information using ICD 10 and DSM V
    - Historical and current treatment plans
    - Historical and current therapist notes
- Recording termination summaries
- Prescriptions
    - Online drug search
    - Tracking past and current prescriptions
    - Generate and send prescriptions
        - E-Prescribe
        - Including a list of common pharmacies for ease of use[2]

The interface for all functionality should be in a “blue and neutral” color scheme with a focus on ease of use. Many of the therapists who will be using this software are of an advanced age, and any accommodations to aid them with use should be implemented. For example zoom and adjustable text size would be prudent. Finally, if plausible, the billing needs of FCS should be addressed handling both varying copayment amounts and a wide range of insurance options. Fortunately, most of the above is accomplished with relative ease through OpenEMR.

[1] As demonstrated here.
[2] As demonstrated here.

2.2 Implementation Through OpenEMR

Freely available and free to modify, OpenEMR provides a robust business solution. Detailed here are the specific ways OpenEMR addresses our client's priorities. Again beginning with client data, by default the system records primary patient information (name, date of birth, sex, identification), marital status, contact and billing information, etc. Furthermore, and importantly so, OpenEMR allows for customizable user defined fields to cover any non-default data points such as income or head of household. Scheduling and tracking appointments, recording encounters, and prescribing medication are all well within the solution's repertoire.

Default settings leave only a few edge cases to be developed and fully realized. Termination summaries are a key piece of patient information that is not ready to be recorded out-of-the-box. A summary could be added as an arbitrary data point to finalized clientele or as an optional input during an encounter.[3] By default, OpenEMR only includes the ICD 9 library of diagnoses. Our client requires the ICD 10 and DSM V libraries; thankfully the software does include methods of adding these libraries.[4] Billing is well handled, except for billing from grants and any possible arbitrary gradation of copayments required — which vary on patient household income. The user interface satisfies the client's color preference just fine, however the php based system does not handle accommodating even slightly visually impaired people. Given the septuagenarians working for FCS this simply will not do and must be addressed.

As indicated in most of the above edge cases while OpenEMR does not cover these points it has left itself adequately open for us to make these requisite changes and satisfy the client's requirements. OpenEMR's wiki provides step by step installation instructions here and this video playlist shows OpenEMR being set up for a practice.

3 Data Dictionary

Access Group - OpenEMR's way of grouping user access levels. A category of access level restrictions.

[3] The demonstrator during this video shows a drop down menu of various options of data entry for the doctor to use. Termination summary could simply be one of these options.
[4] See designer note 1.

Administrator - A role within the system for the owner and managers to have access to the system.

Advanced Age - Old or Elderly.

Appointment - The allotted time for a future visit.

Billing Software - The third-party software that FCS uses for billing purposes.

Client - An individual seeking medical care from FCS, also Patient.

Client Data Fields - Columns in the database related to Client data that can be modified dynamically within OpenEMR. Within this project, this will mainly refer to the various demographic information required by FCS.

Data Group - A category of data fields that can be used for reporting or collecting client information.

Diagnosis - Data regarding the specific DSM conditions attributed to patients.

DSM-V - Diagnostic and Statistical Manual of Mental Disorders (DSM) 5th (and most current) edition. Similar to ICD-10 but for mental disorders instead of diseases.

EMR - Electronic Medical Record, a way of having digitized medical records.

Encounter - A collection of data referring to a fulfilled appointment. (A Client received care, the data regarding the care given is referred to as the Encounter). Also Visit.

FCS - Family Counseling Services of Northern Utah, the company for which this system will be created.

Field - A text item used within a list.

Grant - A payment method for Clients in which separate funding managed by FCS covers a portion of their bill.

HIPAA - the federal Health Insurance Portability and Accountability Act of 1996. Privacy and Security for Medical Records. The Privacy Rule of 2002 is especially important as it limits the dispersal of information between healthcare professionals. In short, only those that are involved in the cares may have access. Privacy rules detailed here.

ICD - International Classification of Diseases.

ICD-9 - ICD's 9th edition (book/topology).

ICD-10 - ICD's 10th and most current edition (book/topology).

Insurance - A payment method for Clients in which their own personal medical insurance company covers a portion or all of their bill.

List - A list of text items to be used in drop down menus and the like.

Log - Textual notes regarding a visit saved in the system at the end of the visit by the Therapist.

Office Staff - A role within the system for secretary and office employees to have access to the system.

OpenEMR - An open source EMR software that will be optimized for FCS.

Patient - An individual seeking medical care from FCS, also Client.

Report - A list of datas retrieved from the system for viewing and printing purposes.

Septuagenarian - A person, see “Advanced Age”. Esp. between 70 and 79.

System - The final software of this project, customized and optimized from OpenEMR for FCS.

Termination Summary - A form filled out upon closing a patient’s care.

Therapist - A role within the system for mental practitioners to use within the system.

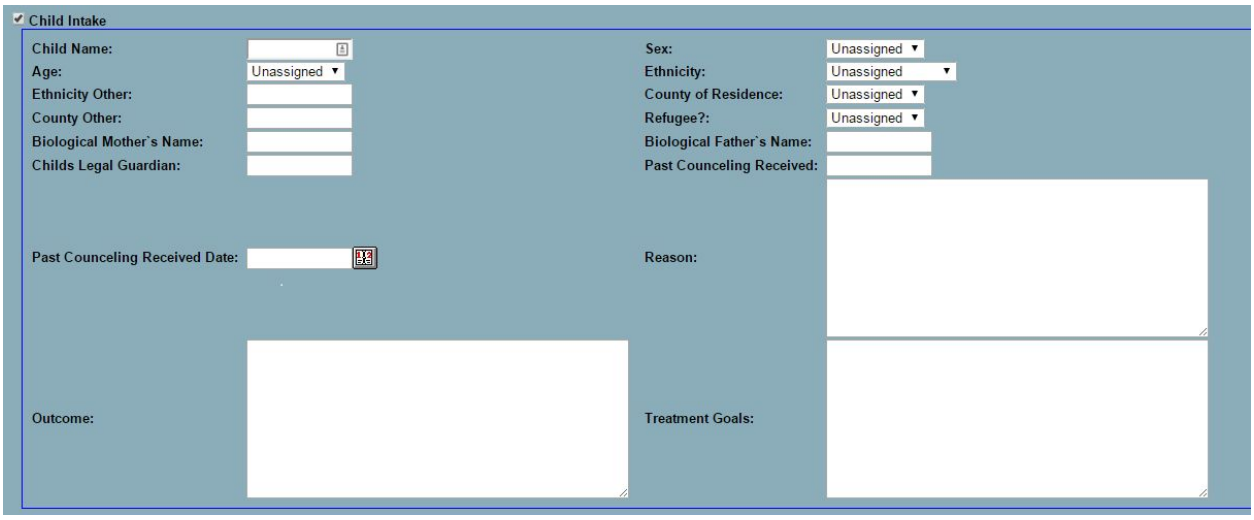
User - An account for an employee of FCS to have access within the system. Sometimes instead meaning the account of the employee currently logged into the system.

Visit - A collection of data referring to a fulfilled appointment. (A Client received care, the data regarding care given is referred to as the Visit). Also Encounter.

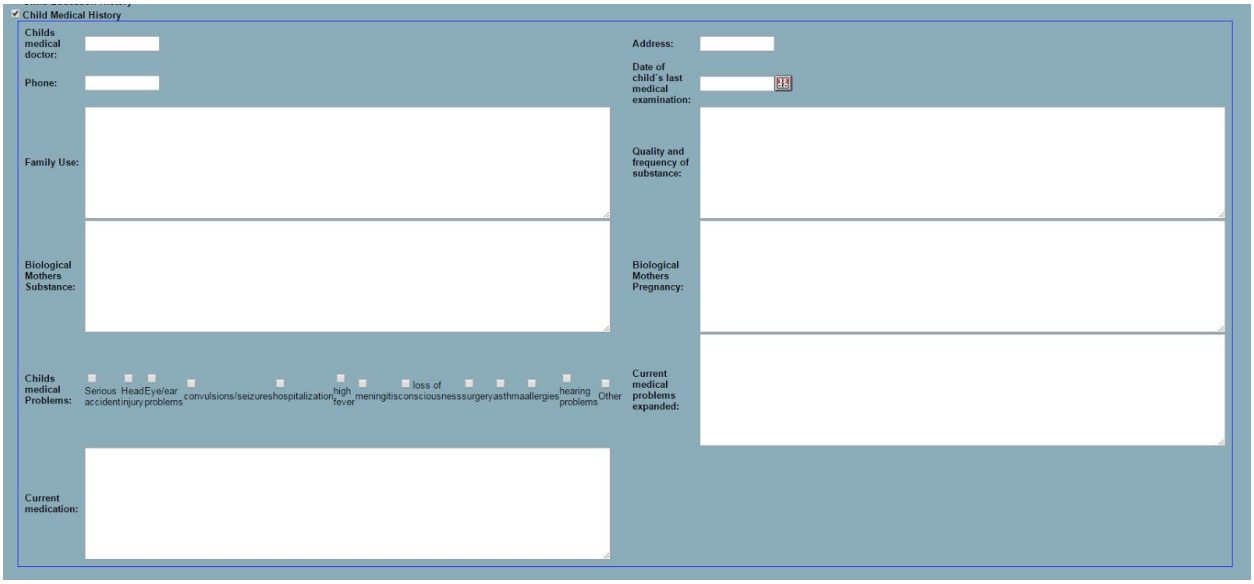
4 ProtoType/Screenshots

4.1 Adult Intake Form

4.2 Child Intake Form

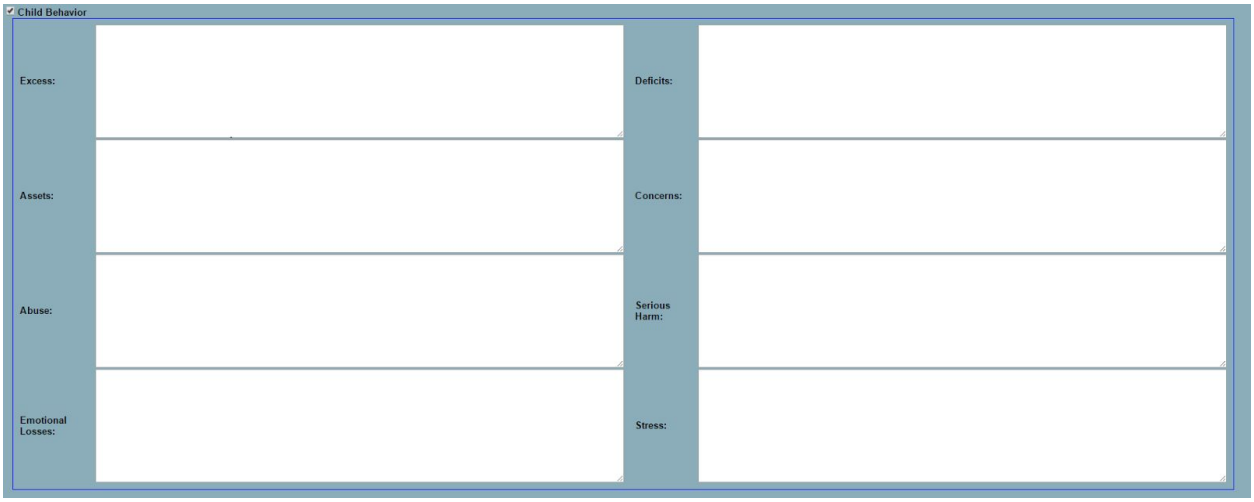


4.3 Child Medical Information



4.4 Child Education

4.5 Child Behavior



5 ERD

Can be found on OpenEMR's wiki at the URL:
http://www.open-emr.org/wiki/index.php/Database_Structure

5.1 Table Insertion Guide

The tables below outline the necessary data to create new data tables in OpenEMR using Use Case UC19. Each table consists of the following elements:
Title – The name the group should be given.
Order – Determines the order the fields will appear on the screen with the lowest numbers being at the top and the highest at the bottom.
ID – This is the name of the field in the database and will be added to the patient_data table in the database.
Label – The name the field will display on the patient's information.
Data Type – The way the field will display on the patient information.
Size – If there is only one number it is the width if there are two numbers (100/10) the first is the width and the second is the height, this is only needed for the textareas data type.

Max Size – Maximum number of characters that can be put in the box, this will also determine the size limit on the varchar in the database.
List – If a list box is selected in the data type a predefined list must be selected, more on this in the list table section.

There are six other fields on the Edit Layout screen which always have the same values or do not need to be filled in. These are:
UOR – Determines if field is required, optional or unused.
Backup List – Can be left blank or filled with a secondary list in case the primary has an issue.
Label Cols – Can be set to 1 or increased if the label needs to be longer.
Data Cols – Can be set to 1 or increased if the size of fields needs to increase, this may be advisable for the textareas if the screen is too cluttered.
Options – These are preprogrammed features integrated into the design, entering the following letters will alter the fields in the following ways:

- A = Age
- B = Gestational Age
- C = Capitalize first letter of each word (text fields)
- D = Check for duplicates in New Patient form
- G = Graph-able (for numeric fields in forms supporting historical data)
- H = Read-only field copied from static history
- L = Lab Order ("ord_lab") types only (address book)
- N = Show in New Patient form
- O = Procedure Order ("ord_*") types only (address book)
- P = Paste (copies data from previous encounter)
- R = Distributor types only (address book)
- T = Makes the "Description field" a default value for the data (enables static text)
- U = Capitalize all letters (text fields)
- V = Vendor types only (address book)
- X = (NOT DOCUMENTED YET, Unknown can be found in Referral Referrals for referrer_diagnosis fields)
- 0 = Read only (un-editable)
- 1 = Write Once (not editable when not empty) (text fields)
- 2 = Billing codes description

A,C,D,U,0 and 1 seem to be the only useful options pertaining to the project.

Description – Used solely in this admin to so you know what data is used for.

Child Intake						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	ch_Name	Client Name	Textbox	10	65	
2	ch_sex	Sex	List box		10	sex
3	ch_Age	Age	List box	10	10	child_age
4	ch_Ethnicity	Ethnicity	List box		10	new_ethnicity
5	ch_et_other	Ethnicity Other	Textbox	10	65	
6	ch_County	County of Residence	List box		10	new_county
7	ch_county_o	County Other	Textbox	10	65	
8	ch_Refugee	Refugee?	List box		10	yesno
9	ch_Bio_Mothers	Biological Mother's Name	Textbox	10	65	
10	ch_Bio_Fathers	Biological Father's Name	Textbox	10	65	
11	ch_legal_guardian	Child’s Legal Guardian	Textbox	10	65	
12	ch_Past_con	Past Counseling Received	Textbox	10	65	
13	ch_Past_con_date	Past Counseling Received Date	Text-date		65	
14	ch_Reason	Reason	Textarea	50/10	250	
15	ch_outcome	Outcome	Textarea	50/10	250	
16	ch_treatment	Treatment Goals	Textarea	50/10	250	

Child Medical History						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	cmh_dr_name	Child’s medical doctor	Textbox	10	65	
2	cmh_dr_add	Address	Textbox	10	65	
3	cmh_dr_phone	Phone	Textbox	10	25	
4	cmh_last_ex	Date of child's last medical examination	Text-date		25	
5	cmh_family_use	Family Use	Textarea	100/10	200	
6	cmh_use_freq	Quality and frequency of substance	Textarea	100/10	200	
7	cmh_bms	Biological Mother’s Substance	Textarea	100/10	200	
8	cmh_bmp	Biological Mother’s Pregnancy	Textarea	100/10	200	
9	cmh_cmp	Child’s medical Problems	Checkbox List	200	50	cmh_cmp
10	cmh_cmpe	Current medical problems expanded	Textarea	100/10	200	
11	cmh_c_med	Current medication	Textarea	100/10	200	

Child Education History						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	edu_school_name	Child's School	Textbox	10	65	
2	edu_school_add	School Address	Textbox	10	65	
3	edu_teach_name	Teacher's Name	Textbox	10	60	
4	edu_current_grade	Current Grade	Textbox	2	2	
5	edu_school_phone	Phone	Textbox	10	20	
6	edu_teach_eval	Teacher's Evaluation	Textarea	100/10	200	
7	edu_other_school	Other schools attended	Textarea	100/10	200	
8	edu_repeated	Repeated a Grade?	List box		10	yesno
9	edu_g_repeated	Which grade?	Textbox	2	2	
10	edu_ses	Special Education Services	Textarea	100/10	200	
11	edu_pas	Problems at school	Checkbox List	100	200	edu_pass
12	edu_other	Other	Textbox	10	60	

Child Behavior						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	b_excess	Excess	Textarea	100/10	200	
2	b_deficits	Deficits	Textarea	100/10	200	
3	b_assets	Assets	Textarea	100/10	200	
4	b_concerns	Concerns	Textarea	100/10	200	
5	b_abuse	Abuse	Textarea	100/10	200	
6	b_serious_harm	Serious Harm	Textarea	100/10	200	
7	b_emotional_losses	Emotional Losses	Textarea	100/10	200	
8	b_stress	Stress	Textarea	100/10	200	

Adult Intake						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	ad_int_name	Name	Textbox	10	65	
2	ad_int_age	Age	Textbox	10	65	
3	ad_int_DOB	Birth Date	Text-date		25	
4	ad_int_home_add	Home Address	Textbox	10	65	
5	ad_int_country	Country	Textbox	10	65	
6	ad_int_home_phone	Home Phone	Textbox	10	65	
7	ad_int_cell_phone	Cell Phone	Textbox	10	65	

8	ad_int_employer	Employer Name	Textbox	10	65	
9	ad_int_occupation	Occupation	Textbox	10	65	
10	ad_int_work_phone	Work Phone	Textbox	10	65	
11	ad_int_ssn	Last 4 of SSN	Textbox	10	65	
12	ad_int_yr_gross_inc	Yearly Gross Income	Textbox	10	65	
13	ad_int_diff_guard	Different Guardian	List box		10	yesno

Different Guardian						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	gua_name	Name	Textbox	10	65	
2	gua_age	Age	Textbox	10	65	
3	gua_DOB	Birth Date	Text-date		25	
4	gua_relation	Relationship to Client	List box		10	Guardian_Relationship
5	gua_Home_Add	Home Address	Textbox	10	65	
6	gua_country	Country	Textbox	10	65	
7	gua_home_phone	Home Phone	Textbox	10	25	
8	gua_cell_phone	Cell Phone	Textbox	10	25	
9	gua_emp_name	Employer Name	Textbox	10	65	
10	gua_occupation	Occupation	Textbox	10	65	

11	gua_work_phone	Work Phone	Textbox	10	25	
12	gua_SSN	Last 4 of SSN	Textbox	4	4	
13	gua_yrly gross_inc	Yearly Gross Income	Textbox	10	25	
14	gua_insurance	Insurance	Textbox	10	65	
15	gua_name_ins	Name of Insurance Company	Textbox	10	65	
16	gua_emerg_con	Emergency Contact	Textbox	10	65	
17	gua_emerg_phone	Emergency Telephone	Textbox	10	65	

Demographic						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	dem_Date	Date	Text-date		25	
2	dem_client	Name of Client	Textbox	10	65	
3	dem_no	New or Ongoing	List box		10	dem_no
4	dem_ifg	Individual Family Group	List box		10	dem_ifg

5	dem_hothg	Head of the Household Gender	List box		10	sex
6	dem_noiith	# of individuals in the household	Textbox	2	2	
7	dem_age	Age	List box		10	dem_age
8	dem_gender	Gender of Client	List box		10	sex
9	dem_ethnicity	Ethnicity	List box		10	new_ethnicity
10	dem_ethnicity_o	Ethnicity Other	Textbox	10	65	
11	dem_income	Income	List box		10	dem_income
12	dem_county	County	List box		10	new_county
13	dem_county_o	County Other	Textbox	10	65	
14	dem_contact_time	Contact time	List box		10	new_contact_time
15	dem_ncih	New Client Intake hr.	Textbox	10	65	
16	dem_funding	Funding Source	List box		10	dem_funding

DSM IV Diagnosis						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	dsm_name	Client Name	Textbox	10	65	
2	dsm_dofts	Date of First Therapy Session	Text-date		25	
3	dsm_dod	Date of Diagnosis	Text-date		25	

4	dsm_axis1	Axis 1: Clinical Disorders	Textbox	10	25	
5	dsm_axis2	Axis 2: Personality Disorders/Mental/Retardation	Textbox	10	25	
6	dsm_axis3	Axis 3: General Medical Conditions and Disorders	Textbox	10	25	
7	dsm_axis4	Axis 4: Psychosocial and Environmental Problems	Textbox	10	25	
8	dsm_axis5	Axis 5: Global Assessment of Functioning	Textbox	10	25	
9	dsm_t_name	Therapist Name	Textbox	10	65	

Treatment Plan						
Order	**ID**	**Label**	**Data Type**	**Size**	**Max Size**	**List**
1	tp_name	Client Name	Textbox	10	65	
2	tp_dob	Date of Birth	Text-date		25	
3	tp_int_date	Intake Date	Text-date		25	
4	tp_1_prob	Problem #1	Textarea	100/10	200	
5	tp_1_goal	Goal	Textarea	100/10	200	
6	tp_1_obj1	Objective #1	Textarea	100/10	200	
7	tp_1_obj2	Objective #2	Textarea	100/10	200	
8	tp_1_obj3	Objective #3	Textarea	100/10	200	
9	tp_1_obj4	Objective #4	Textarea	100/10	200	
10	tp_1_int	Intervention	Textarea	100/10	200	
11	tp_1_type	Therapy Type	List box		10	tp_type
12	tp_1_freq	Frequency	Textbox	10	65	

13	tp_1_ca	Counselor Assigned	Textbox	10	65	
14	tp_1_d_res	Date Resolved	Text-date		25	
15	tp_1_res	Resolution Description	Textarea	100/10	200	
16	tp_2_prob	Problem #2	Textarea	100/10	200	
17	tp_2_goal	Goal	Textarea	100/10	200	
18	tp_2_obj1	Objective #1	Textarea	100/10	200	
19	tp_2_obj2	Objective #2	Textarea	100/10	200	
20	tp_2_obj3	Objective #3	Textarea	100/10	200	
21	tp_2_obj4	Objective #4	Textarea	100/10	200	
22	tp_2_int	Intervention	Textarea	100/10	200	
23	tp_2_type	Therapy Type	List box		10	tp_type
24	tp_2_freq	Frequency	Textbox	10	65	
25	tp_2_ca	Counselor Assigned	Textbox	10	65	
26	tp_1_d_res	Date Resolved	Text-date		25	
27	tp_2_d_res	Resolution Description	Textarea	100/10	200	
28	tp_3_prob	Problem #3	Textarea	100/10	200	
29	tp_3_goal	Goal	Textarea	100/10	200	
30	tp_3_obj1	Objective #1	Textarea	100/10	200	
31	tp_3_obj2	Objective #2	Textarea	100/10	200	
32	tp_3_obj3	Objective #3	Textarea	100/10	200	
33	tp_3_obj4	Objective #4	Textarea	100/10	200	
34	tp_3_int	Intervention	Textarea	100/10	200	
35	tp_3_type	Therapy Type	List box		10	tp_type

36	tp_3_freq	Frequency	Textbox	10	65	
37	tp_3_ca	Counselor Assigned	Textbox	10	65	
38	tp_1_d_res	Date Resolved	Text-date		25	
39	tp_3_d_res	Resolution Description	Textarea	100/10	200	

5.2 List Insertion Guide

The tables below outline the necessary data to create new lists for data tables in OpenEMR using Use Case UC22. Lists are simply the data displayed in drop down lists, they are needed whenever a list box is selected as the data type on a data field. Each table consists of the following elements:

Table Title – The name the list should be given.
ID – The name of the element inside the list table of the database.
Title – The entry that will show up on the list.
Order – The order these will show on the list sorting from smallest to largest.

Other elements that will be on this screen are:

Default – If checked this will be the item that is displayed on the list box when no selection has been made. Leaving this blank will cause the box to be blank until clicked on.
Active – This must be checked for all options displayed.
Notes – This is used on the admin's screen so the users know what it is for.
Codes – Unknown if implementation is necessary.

Please be aware when entering fields, only enter 3 rows at a time and then save. Hitting save will both save the list and cause blank rows to appear at the bottom of the list.

Child_Age		
ID	**Title**	**Order**
05	0-5	1
611	6-11	2
1217	12-17	3

New_Ethnicity		
ID	**Title**	**Order**
w	White	1
h	Hispanic	2
aa	African American	3
a	Asian	4
pi	Pacific Islander	5
na	Native American	6
o	Other	7

New_County		
ID	**Title**	**Order**
1	Weber	1
2	Davis	2
3	DCLC	3
4	Morgan	4

5	Box Elder	5
6	Other	6

cmh_cmp

ID	Title	Order
sa	Serious accident	1
ha	Head injury	2
eep	Eye/ear problems	3
cs	convulsions/seizures	4
h	hospitalization	5
hf	high fever	6
m	meningitis	7
loc	loss of consciousness	8
s	surgery	9
as	asthma	10
al	allergies	11
hp	hearing problems	12
o	Other	13

edu_pass

ID	Title	Order
f	fighting	1

s	suspension	2
g	gang	3
lof	lack of friends	4
ld	learning disabilities	5
pa	poor attendance	6
pg	poor grades	7
ih	incomplete homework	8
bp	behavior problems	9
d	detention	10
da	drugs/alcohol	11
o	other	12

Guardian_Relationship

ID	Title	Order
spouse	Spouse	1
pg	Parent/Guardian	2
other	Other	3

dem_no

ID	Title	Order
n	New	1
o	Ongoing	2

dem_ifg		
ID	**Title**	**Order**
i	Individual	1
f	Family	2
g	Group	3

dem_age		
ID	**Title**	**Order**
1	0-5	1
2	6-11	2
3	12-17	3
4	18-23	4
5	24-44	5
6	45-54	6
7	55-69	7
8	70+	8

dem_income		
ID	**Title**	**Order**
1	$0-9,999	1
2	$10,000-14,999	2
3	$15,000-24,000	3

4	$25,000-34,999	4
5	$35,000 +	5

dem_funding		
ID	**Title**	**Order**
1	LHM	1
2	MDR	2
3	IBF	3
4	XX	4
5	WCJ	5
6	SELF	6
7	EAP	7
8	IAT	8
9	IBX	9
10	ECR	10
11	ICV	11
12	IMG	12
13	ITC	13
14	IUB	14
15	IVR	15
16	ULT	16
17	DCJ	17
18	DCFS	18

19	YCC	19
20	HM	20
21	DCLC	21
22	MTC	22
23	OSD	23
24	IAB	24
25	GEHA	25
26	WCF	26
27	SLF	27
28	EMI	28
29	IVO	29
30	NFF	30
31	RNC	31
32	ANG	32
33	ICG	33
34	GDEF	34
35	IPH	35
36	APWU	36
37	UIT	37
38	UWNU	38
39	BSH	39
40	UHC	40

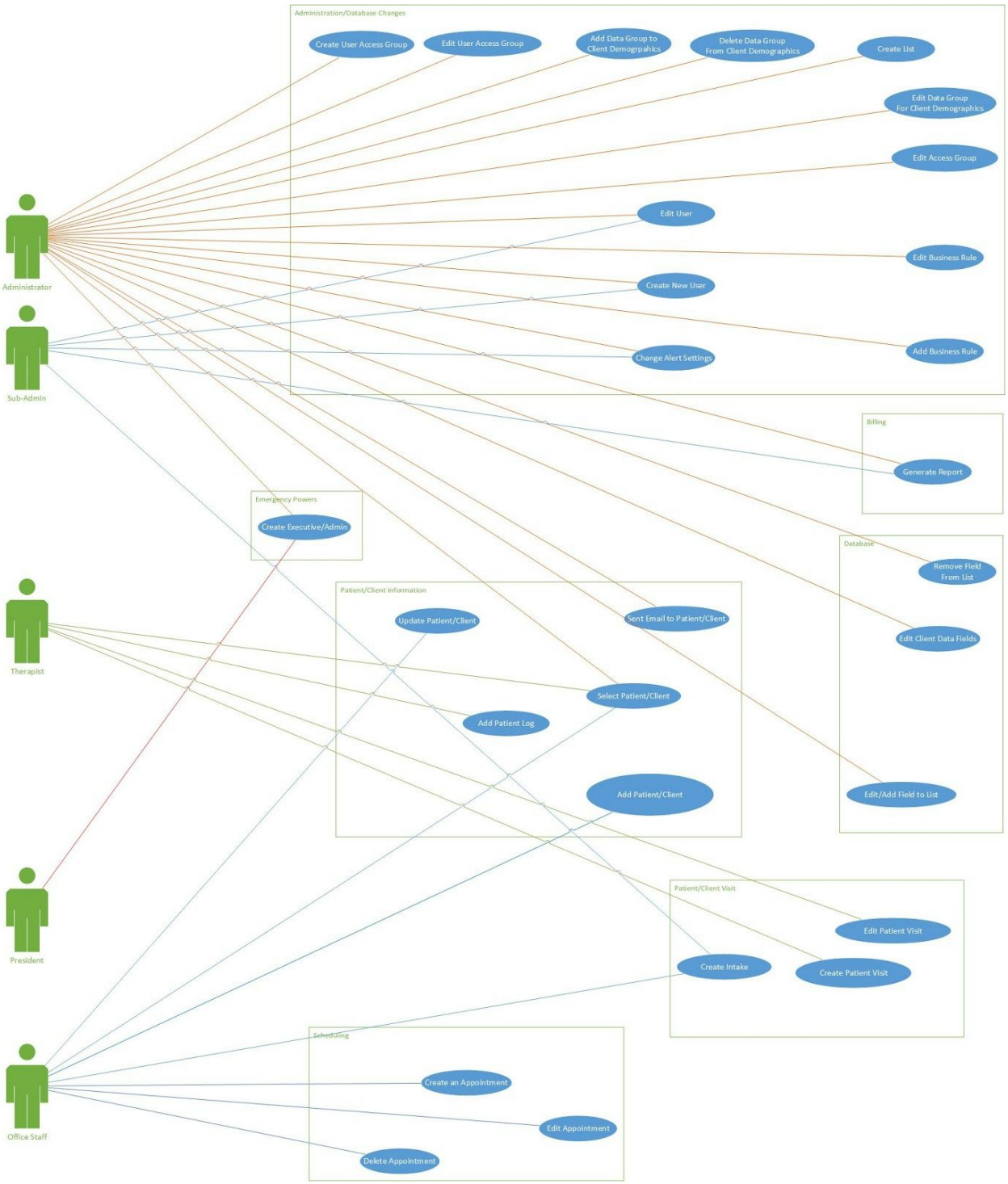
dem_contact_time

ID	Title	Order
LTCXL	Late Cancel	1
CXL	Cancel	2
NS	No Show	3

tp_type

ID	Title	Order
i	Individual	1
f	Family	2
c	Couples	3
gt	Group Therapy	

6 Use Case Diagram



7 Use Case Scenarios

7.1 Use Case UC1: Add Patient/Client

Primary Actor: Office Staff

Stakeholders and Interests: Office Staff will gather information on new Patients and then add them to the system. They will then assign the new Patients to a Therapist. Therapists will be able to access their Patient's information each time they log into the system. Administrators will have a wider range of authority and be able to add Patients to specific Therapists.

Preconditions: User must have Patient's information and be logged in.

Success Guarantee (or Postconditions): Patient is added into the system.

Main Success Scenario (or Basic Flow):

1. Select the Patient/Client tab
2. Select the New/Search option
3. Fill in client name, date of birth, etc.
4. Check other boxes depending on available information
5. Select Create New Patient option
   <Attention to assigning the Patient/Client to a specific Therapist should be taken into account. (Is this done by Office Staff at Patient creation or by Admin later?)>
6. Select Confirm Create New Patient option (this allows duplicates)

Extensions (or Alternative Flows):

- If required fields are not filled, User is prompted
- If Patient history is to be entered,
    - Select the History tab
    - Edit desired fields
    - Select Save option
- If additional Patient information is to be edited,
    - Edit desired fields like immunizations, medication, etc. under the Patient/Client tab
    - Select Save option

7.2 Use Case UC2: Update Patient/Client

Primary Actor: Office Staff

Stakeholders and Interests: Office Staff will be able to access individual Client's information and update Client information when necessary. Administrators will also be able to update Client information.

Preconditions: User must be logged into the system.

Success Guarantee (or Postconditions): Patient information is updated. Save option should disappear.

Main Success Scenario (or Basic Flow):

1. Search for Client using the Patient tab (See Use Case UC3)
2. Select the Edit option for fields needing to be editted
3. Edit selected field
4. Select Save option

Extensions (or Alternative Flows):

7.3 Use Case UC3: Select Patient/Client

Primary Actor: Office Staff

Stakeholders and Interests: Office Staff, Therapists, and Administrators will be able to access client information.

Preconditions: User must be logged into the system.

Success Guarantee (or Postconditions): The correct Client is found and selected.

Main Success Scenario (or Basic Flow):

1. Select the Patient tab
2. Enter the search parameters
3. Select Search option
4. Select desired Client

Extensions (or Alternative Flows):

- If the user wants to search without parameters
    1. Select Search option without entering parameters
       <All Patients are displayed> Continue from 4

7.4 Use Case UC4: Create Patient/Client Visit

Visits and appointments are different, see data dictionary.

Primary Actor: Therapist

Stakeholders and Interests: Therapists and Administrators will be able to create a visit.

Preconditions: User must be logged into the system and Client must be selected (See Use Case UC3).

Success Guarantee (or Postconditions): A visit is successfully created.

Main Success Scenario (or Basic Flow):

1. Select Patient/Client tab
2. Select Create Visit option
   <The selected patient and information form is displayed>
3. Enter relevant information
4. Select Save option

Extensions (or Alternative Flows):

7.5 Use Case UC5: Generate Report

Primary Actor: All

Stakeholders and Interests: All Users want to be able to view various reports within the system. They will be able to run reports selected under their visibility allowances.

Preconditions: User must be logged into the system. Select Patient (UC3) is completed.

Success Guarantee (or Postconditions): Selected report has been generated and is displayed to the user for viewing and/or printing.

Main Success Scenario (or Basic Flow):

1. Select tab
2. Select category within tab
3. Enter required data
4. Select submit option
5. Report will be generated and is displayed to the User

Extensions (or Alternative Flows):

- If submitted fields are invalid and/or return empty results a message will be displayed to the user
- If the user wants to print report
    1. Select print option

7.6 Use Case UC6: Create New User

Primary Actor: Administrator

Stakeholders and Interests: Administrator can create Users and restrict the User's access to data

Preconditions: User must be logged in

Success Guarantee (or Postconditions): New User is created and can login

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Users
3. Select Add User option
4. Fill in new User information
5. Select desired Access Control options
6. Select Save option

Extensions (or Alternative Flows):

- If the username is already in use, a message is displayed to the User

7.7 Use Case UC7: Edit Patient Visit

Primary Actor: Therapist

Stakeholders and Interests: Therapists and Administrators will be able to edit a visit.

Preconditions: The User is logged in. A visit has been created for a Patient (See Use Case UC4), and the Patient has been selected.

Success Guarantee (or Postconditions): A new visit is created containing the old visits information with the new changes. The old visit remains in its original form.

Main Success Scenario (or Basic Flow):

1. Select Visit History
2. Select the desired visit
3. Select Edit option
4. Make desired changes
5. Select Save option

Extensions (or Alternative Flows):

- If the visit is current
    1. Select Current option

  Continue from main success scenario

7.8 Use Case UC8: Create Intake

Primary Actor: Office Staff

Stakeholders and Interests: Office Staff and Sub-Administrators will be able to add an initial information batch in a way similar to adding a visit (UC4).

Preconditions: The User must be logged in. A Patient has been created (See Use Case UC1), and the Patient has been selected (UC3).

Success Guarantee (or Postconditions): A new visit is created containing the Patient's initial information.

Main Success Scenario (or Basic Flow):

1. Select Patient/Client tab
2. Select Create Visit option
   <The selected patient and information form is displayed>
3. Enter intake information
4. Select Save option

Extensions (or Alternative Flows):

7.9 Use Case UC9: Add Patient Log

Primary Actor: Therapist

Stakeholders and Interests: Administrator/Therapist want the visit notes saved for each Patient's visit

Preconditions: User must be logged in. Patient must be selected.

Success Guarantee (or Postconditions): A log is added for the Patient

Main Success Scenario (or Basic Flow):

1. Select Visits tab
2. Select Create Visit option
3. Enter information into the Brief Description field
4. Select Visit Category
5. Select Facility
6. Select Billing Facility
7. Select Sensitivity
8. Select Date of Service
9. Select Onset/Hosp. Date
10. Enter/Add Issues (Injuries/Medical/Allergy/Etc.)
11. Select Save option

Extensions (or Alternative Flows):

- If the User decides to not create log
    1. Select Cancel option
- If the Client does not exist
    1. See Use Case UC1
    2. Proceed with Basic Flow

7.10 Use Case UC10: Send Email to Patient/Client

Primary Actor: Administrator

Stakeholders and Interests: Administrator can send reminder emails to the patient

Preconditions: User must be logged in

Success Guarantee (or Postconditions): Notification emails are sent to patient

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Notifications
3. Fill in required fields
4. Select the Save option

7.11 Use Case UC11: Create Appointment

Visits and appointments are different, see data dictionary.

Primary Actor: Office Staff

Stakeholders and Interests: An Office Staff or Administrator can make an appointment

Preconditions: User must be logged in

Success Guarantee (or Postconditions): An appointment is created

Main Success Scenario (or Basic Flow):

1. Select the Calendar
2. Enter desired date, time, and duration
3. Select patient (this is populated if a patient has already been selected)
4. Select Save option

Extensions (or Alternative Flows):

7.12 Use Case UC12: Edit Appointment

Primary Actor: Office Staff

Stakeholders and Interests: Administrator or Office Staff may edit an appointment

Preconditions: User must be logged in. Appointment has been made (See Use Case UC11)

Success Guarantee (or Postconditions): The appointment is updated.

Main Success Scenario (or Basic Flow):

1. Select Calendar
2. Select the desired appointment
3. Select the appointment to edit
4. Make changes
5. Select Save option

Extensions (or Alternative Flows):

7.13 Use Case UC13: Delete Appointment

Primary Actor: Office Staff

Stakeholders and Interests: Administrator or Office Staff may delete an appointment

Preconditions: User must be logged in. An appointment has been made (See Use Case UC11).

Success Guarantee (or Postconditions): The appointment is deleted.

Main Success Scenario (or Basic Flow):

1. Select Calendar
2. Select the desired appointment
3. Select the appointment to edit
4. Select Delete option

Extensions (or Alternative Flows):

7.14 Use Case UC14: Create User Access Group

Primary Actor: Administrator

Stakeholders and Interests: Administrator can create a new access group

Preconditions: User must be logged in

Success Guarantee (or Postconditions): A new access group will be created

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select ACL option
3. Select Groups and Access Controls
4. Select Add New Group option
5. Fill in New Group Information
6. Select Submit option
7. Select Edit option associated with newly created group
8. Move items from inactive list as needed

Extensions (or Alternative Flows):

7.15 Use Case UC15: Edit Access Group

Primary Actor: Administrator

Stakeholders and Interests: Administrator can edit an existing access group

Preconditions: User must be logged in. Access group has been created (see Use Case UC14)

Success Guarantee (or Postconditions): The group is updated

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select ACL option
3. Select Groups and Access Controls
4. Select Edit option associated with the group
5. Move items from inactive, or active, list as needed

Extensions (or Alternative Flows):

7.16 Use Case UC16: Edit User Access Group

Primary Actor: Admin

Stakeholders and Interests: Administrator can edit a user access group

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The access group is updated.

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select ACL option
3. Select User to edit
4. Select roles as needed

Extensions (or Alternative Flows):

- Access groups can be changed by editing Users (See Use Case UC17)

7.17 Use Case UC17: Edit User

Primary Actor: Administrator

Stakeholders and Interests: Administrator can edit an existing user

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The existing user is updated

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Users option
3. Select the specific User
4. Edit desired fields
5. Select Save option

Extensions (or Alternative Flows):

- If User enters invalid data, an error is shown
- If User enters password incorrectly, an error is shown
- If User does not enter all required fields, an error is shown

7.18 Use Case UC18: Edit Client Data Fields

Primary Actor: Administrator

Stakeholders and Interests: Administrator can edit Client data fields

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The Client data fields are successfully edited.

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Layouts option
3. Select Demographics from the Edit Layout menu
4. Add a group (See Use Case UC14), or edit a group (See Use Case UC16), or delete groups.
5. Select save option

Extensions (or Alternative Flows):

7.19 Use Case UC19: Add Data Group to Client Demographics

Primary Actor: Administrator

Stakeholders and Interests: Administrator can add a data group to Client demographics

Preconditions: User must be logged in. A group must exist (See Use Case UC14).

Success Guarantee (or Postconditions): The data group is added to Client demographics

Main Success Scenario (or Basic Flow):

1. Select Add Group option
2. Enter group name
3. Follow steps on UC17 alternate flow 1 to add fields

Extensions (or Alternative Flows):

7.20 Use Case UC20: Edit Data Group For Client Demographics

Primary Actor: Administrator

Stakeholders and Interests: Administrator can edit an existing data group for Client demographics

Preconditions: User must be logged in. A group must exist (See Use Case UC14)

Success Guarantee (or Postconditions): The data group for Client demographics is edited

Main Success Scenario (or Basic Flow):

1. Select Add Field option
2. Enter Order (order on the page the field will appear)
3. Enter ID (name of the field in the Database can not already exist)
4. Enter Label (this is the text that will appear to the left of the field)
5. Select Data Type
6. Enter Size (first box is the width and is required, second is the height and is not required)
7. Enter Maxsize (this is the max number of characters to allow)
8. Enter Label Cols
9. Enter Data Cols
10. Enter Description (this is for the layout only and will help identify what the fields are for)
11. Enter any values for any other fields (these are not required)
12. Select save option

Extensions (or Alternative Flows):

- If the user enters a field ID that already exists
    1. Page fault
    2. User is booted to their homepage within the system

7.21 Use Case UC21: Delete Data Group From Client Demographics

Primary Actor: Administrator

Stakeholders and Interests: Administrator can delete a data group from Client demographics

Preconditions: User must be logged in. Data group must exist (See Use Case UC14)

Success Guarantee (or Postconditions): Group is no longer part of Client demographics

Main Success Scenario (or Basic Flow):

1. Select Data Groups to be deleted
2. Select Delete Group option
3. Confirm warning message

Extensions (or Alternative Flows):

7.22 Use Case UC22: Create List

Primary Actor: Administrator

Stakeholders and Interests: Administrator can create a list

Preconditions: User must be logged in

Success Guarantee (or Postconditions): New list available for use in Admin Layout Screen

Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Lists option
3. Select New List option
4. Enter List Name
5. Select Save option
6. Select List from menu
7. Enter Id for list (this will be the entry in the Database)
8. Enter Name (this will be item displayed on the menu)
9. Enter Order (this will be determine the order of the item in the list, sorts from smallest to largest)
10. Repeat steps 7-9 as needed
11. Select Save option

Extensions (or Alternative Flows):

- If User enters the same field twice on a list
    1. Page fault
    2. User must click on a navigation option
- If User enters the name of an existing list
    1. Page fault
    2. User must click on a navigation option

7.23 Use Case UC23: Edit/Add Field to List

Primary Actor: Administrator

Stakeholders and Interests: Administrator can add or edit a field of an existing list

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The field is added or updated

Main Success Scenario (or Basic Flow):

1. Select Administration
2. Select Lists
3. Select List from Edit List
4. Scroll to bottom of list
5. Enter Id for List (this will be the entry in the Database)
6. Enter Name (this will be item displayed on the drop down)
7. Enter Order (this will be determine the order of the item in the list, sorts from smallest to largest)
8. Repeat steps 7-9 for each entry in the list
9. Click Save

Extensions (or Alternative Flows):

- If User enters the same field twice on a list
    1. Page fault
    2. User must click on a navigation option

7.24 Use Case UC24: Remove Field From List

Primary Actor: Administrator

Stakeholders and Interests: Administrator can delete an existing field

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The field is deleted

Main Success Scenario (or Basic Flow):

1. Select Administration
2. Select Lists
3. Select List from Edit List
4. Select Delete List option
5. Select OK to warning message

Extensions (or Alternative Flows):

7.25 Use Case UC25: Edit Business Rule

Primary Actor: Administrator

Stakeholders and Interests: Administrator can edit a rule

Preconditions: User must be logged in. The rule has been initially created (See Use Case UC26)

Success Guarantee (or Postconditions): The rule is edited

Main Success Scenario (or Basic Flow):

1. Select Administration
2. Select Rules
3. Select the Rule to edit
4. Select Edit next to section to edit
5. Make desired changes to page
6. Select Save option

Extensions (or Alternative Flows):

7.26 Use Case UC26: Add Business Rule

Primary Actor: Administrator

Stakeholders and Interests: Administrator can add a new rule

Preconditions: User must be logged in

Success Guarantee (or Postconditions): The rule is created

Main Success Scenario (or Basic Flow):

1. Select Administration
2. Select Rules
3. Enter Title
4. Select Type
5. Select Save option
6. Enter Intervals information
7. Select Save (Alt 1) option

Extensions (or Alternative Flows):

- User selects Save with no reminder intervals set up
    1. Fields are highlighted in red
    2. User is prevented from moving forward

7.27 Use Case UC27: Change Alert Settings

Primary Actor: Administrator

Stakeholders and Interests: Administrator can change alert settings

Preconditions: User must be logged in

Success Guarantee (or Postconditions): Alert settings are changed

Main Success Scenario (or Basic Flow):

1. Select Administration
2. Select Alerts
3. Check appropriate boxes next to desired alert setting
4. Select Save option

Extensions (or Alternative Flows):

7.28 Use Case UC28: Create Executive/Administrator

Primary Actor: President

Stakeholders and Interests: President can create a new executive in the case of an emergency, or the Administrator can create a new executive to take his place. Similar to creating a new user (UC6).

Preconditions: User must be logged in

Success Guarantee (or Postconditions): Admin is created.

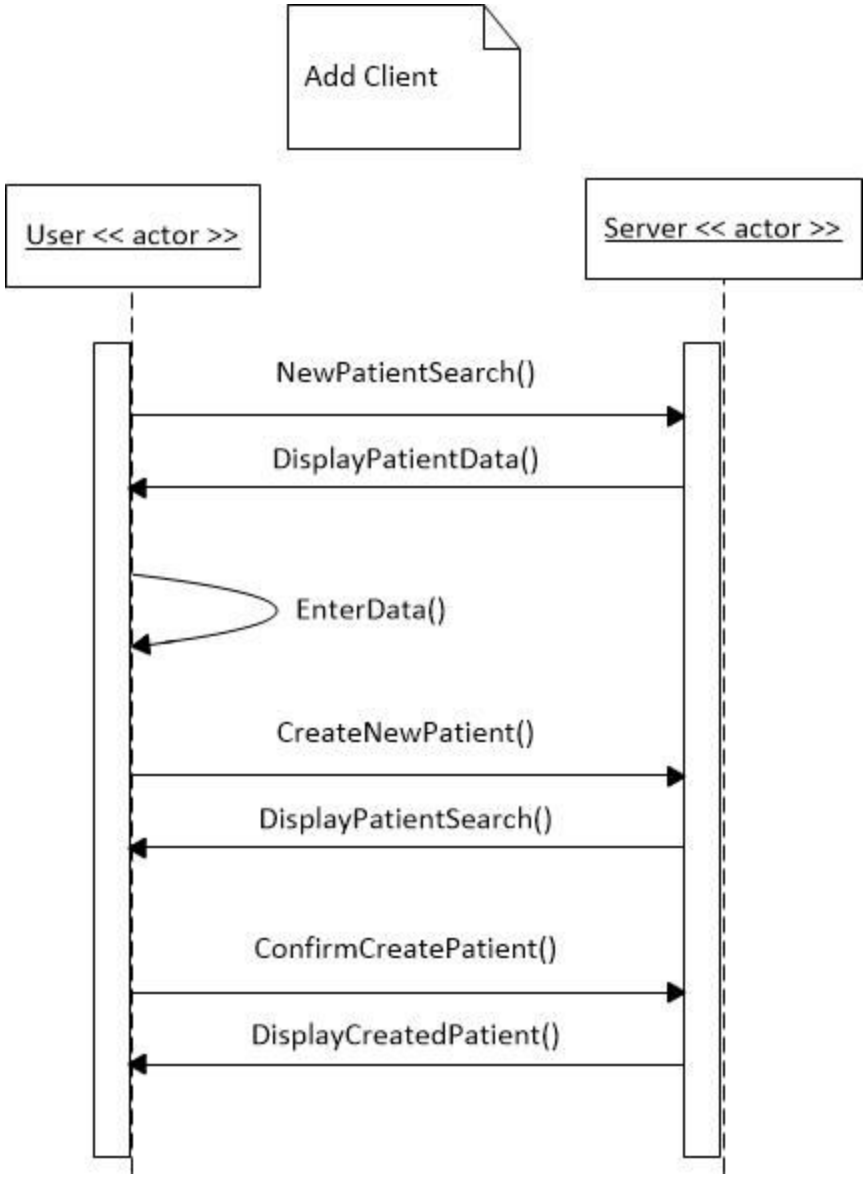
Main Success Scenario (or Basic Flow):

1. Select Administration tab
2. Select Users
3. Select Add User option
4. Fill in new User information
5. Select Administrator as Access Control option
6. Select Save option

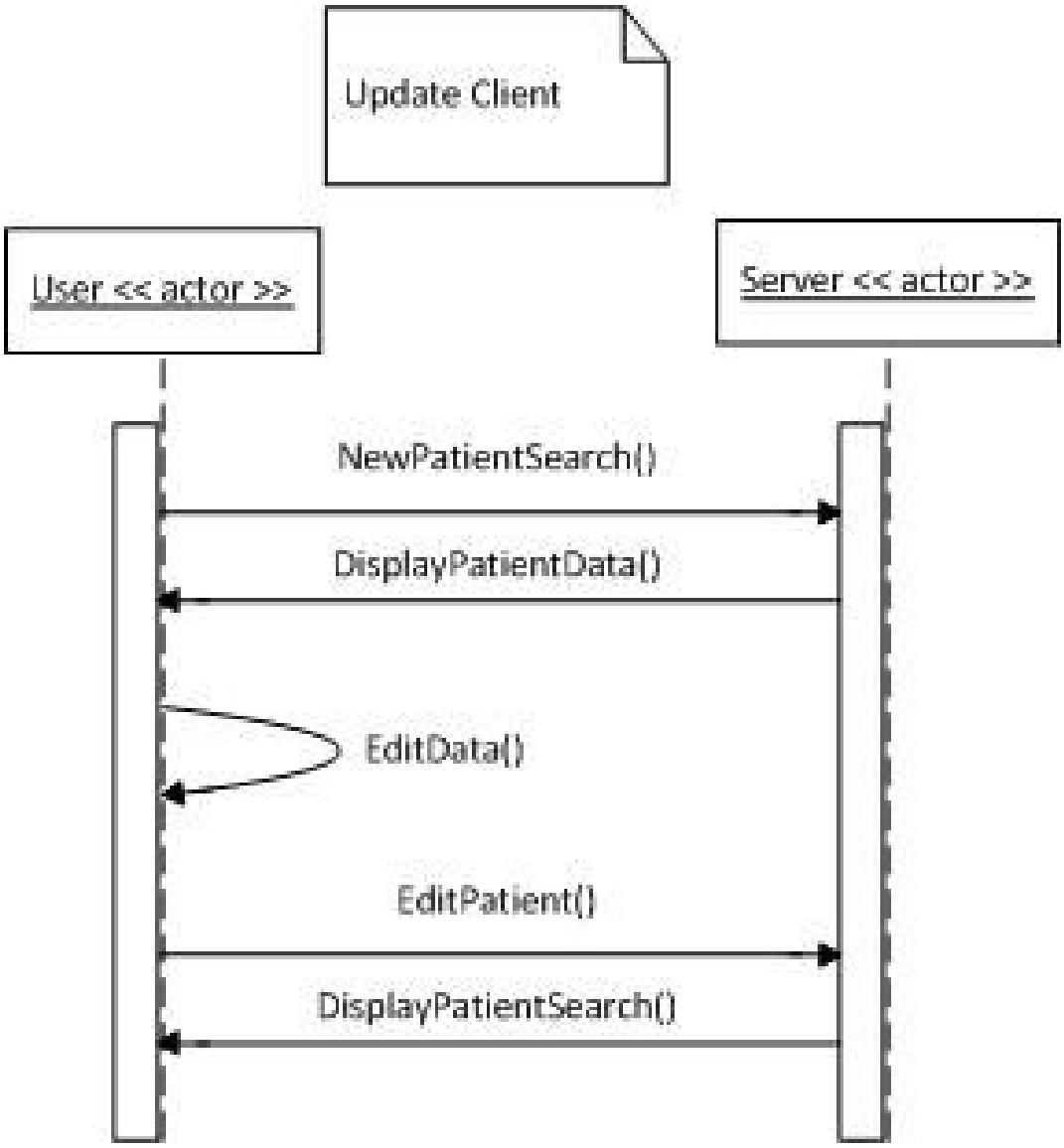
Extensions (or Alternative Flows):

8 Sequence Diagrams

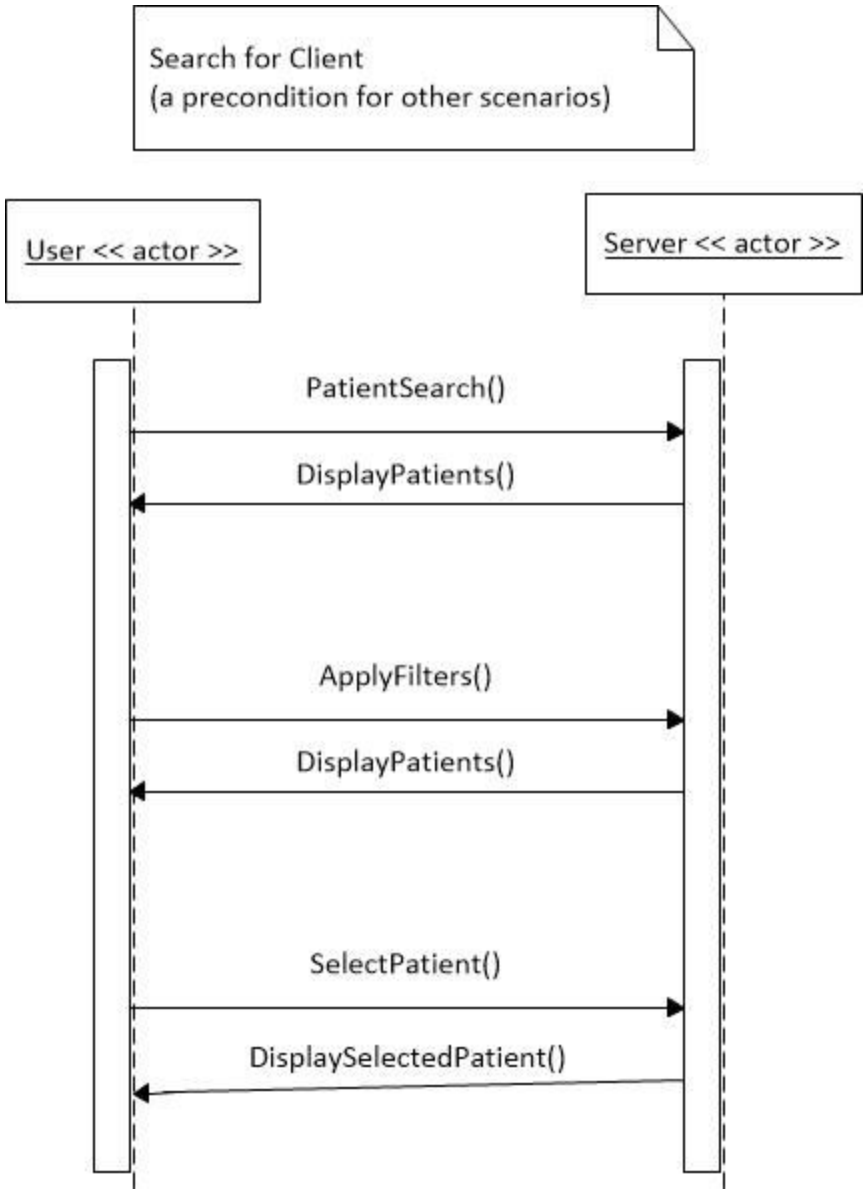
8.1 Add Patient/Client



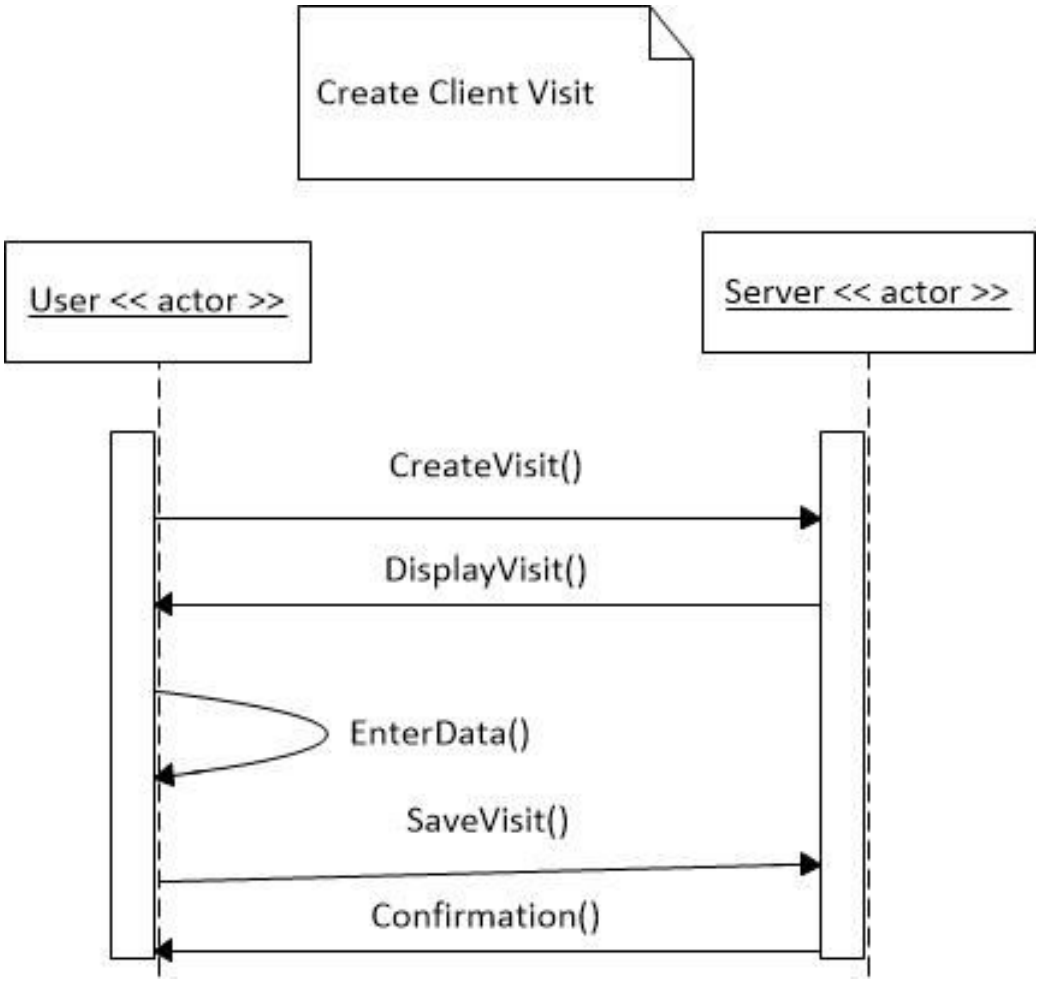
8.2 Update Patient/Client



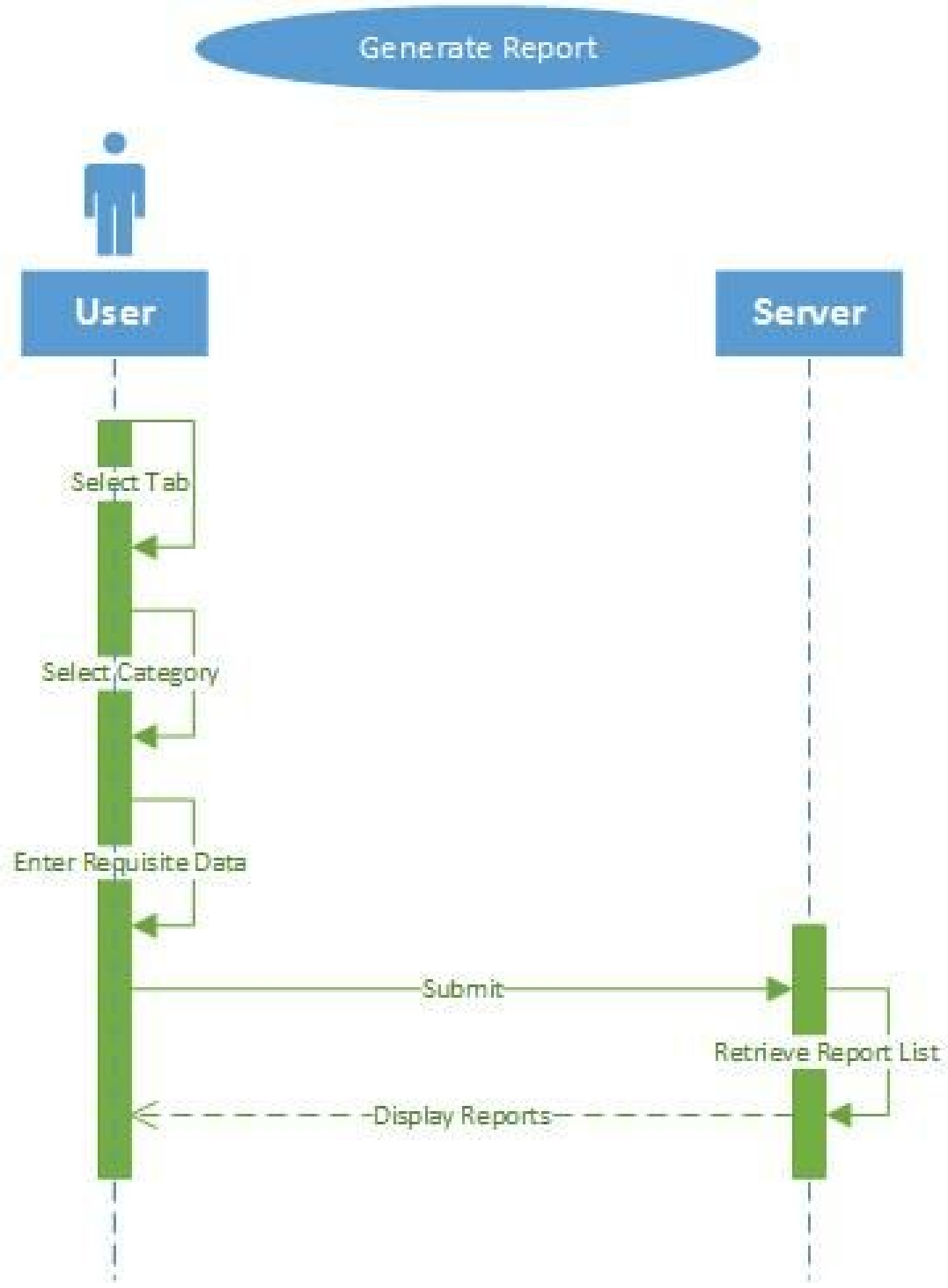
8.3 Select Patient/Client



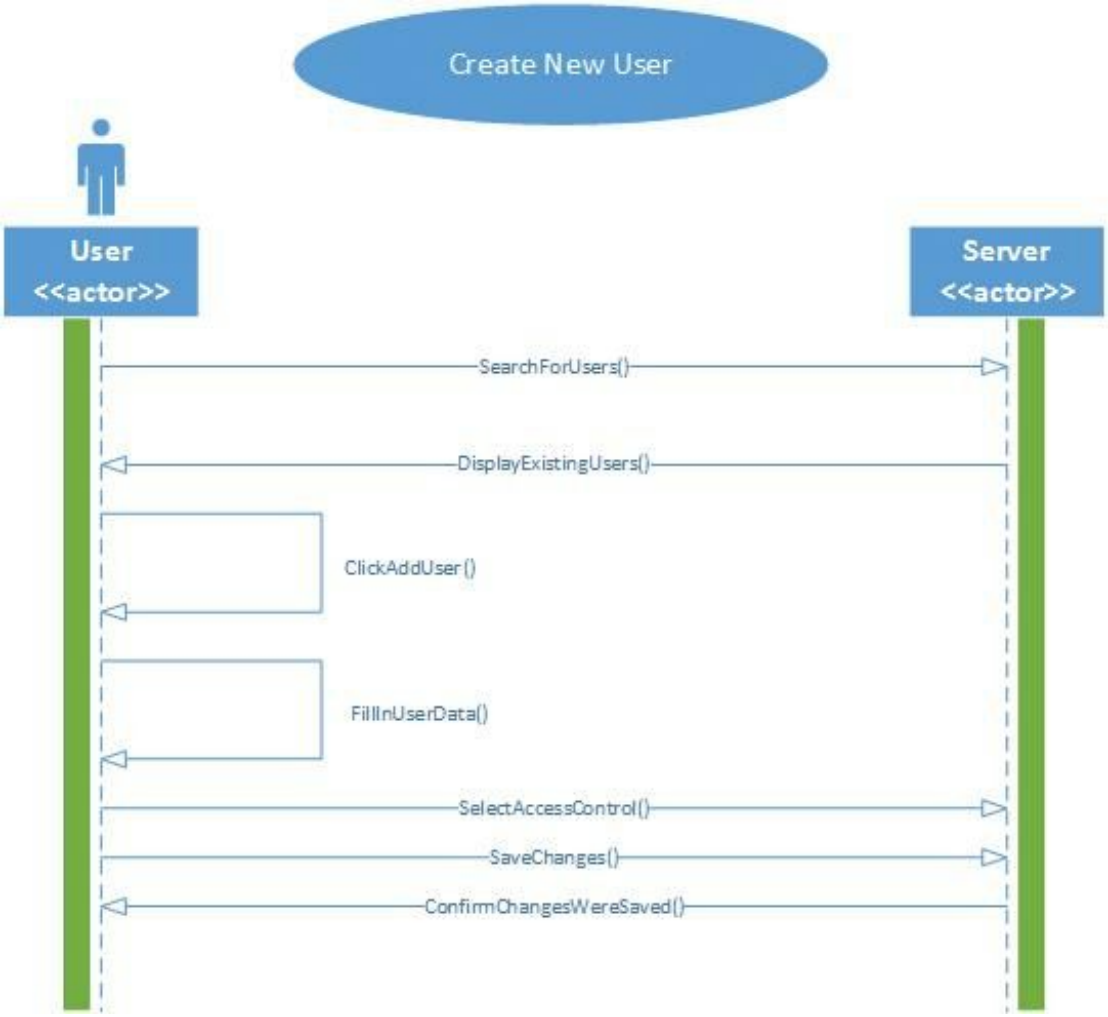
8.4 Create Patient/Client Visit



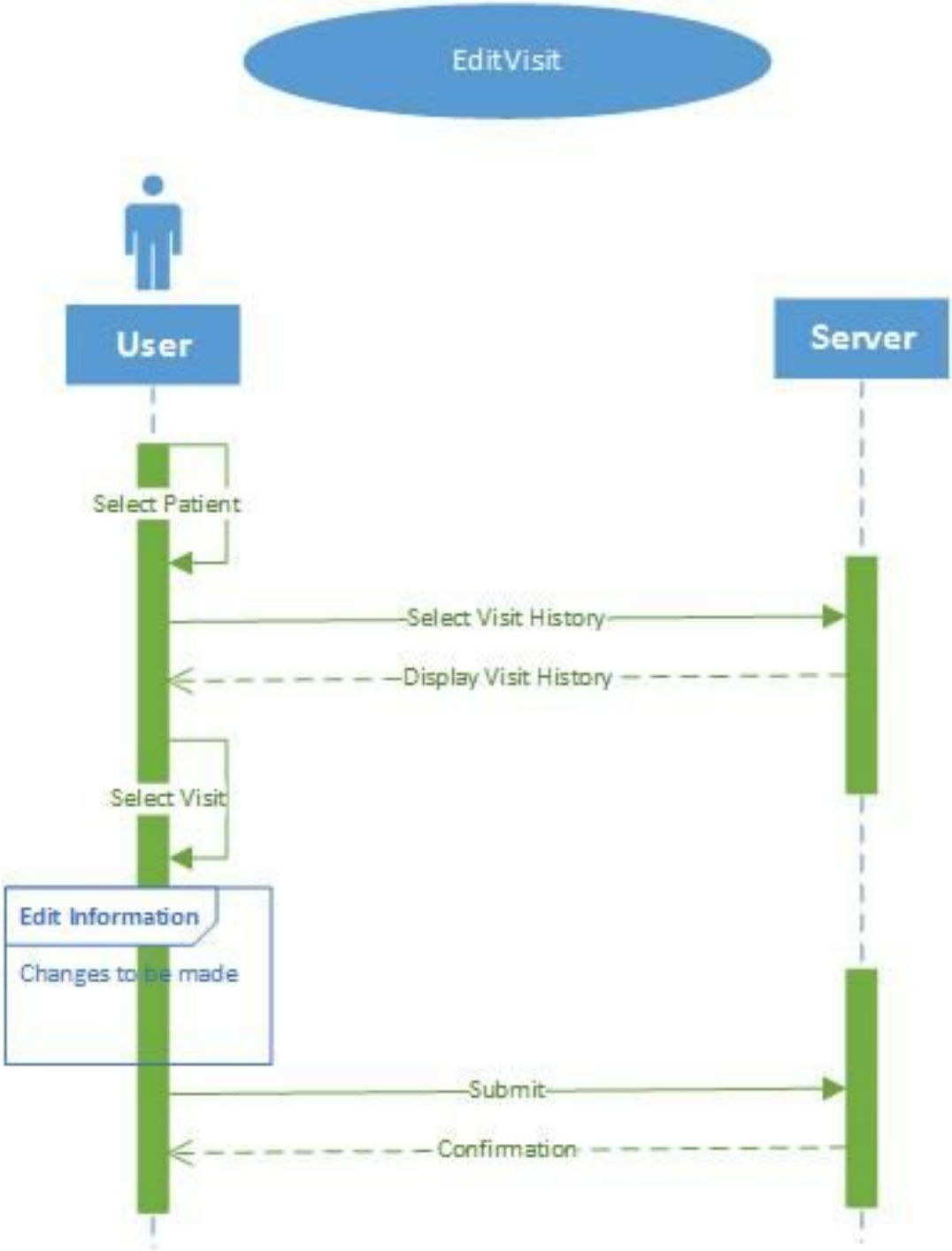
8.5 Generate Report



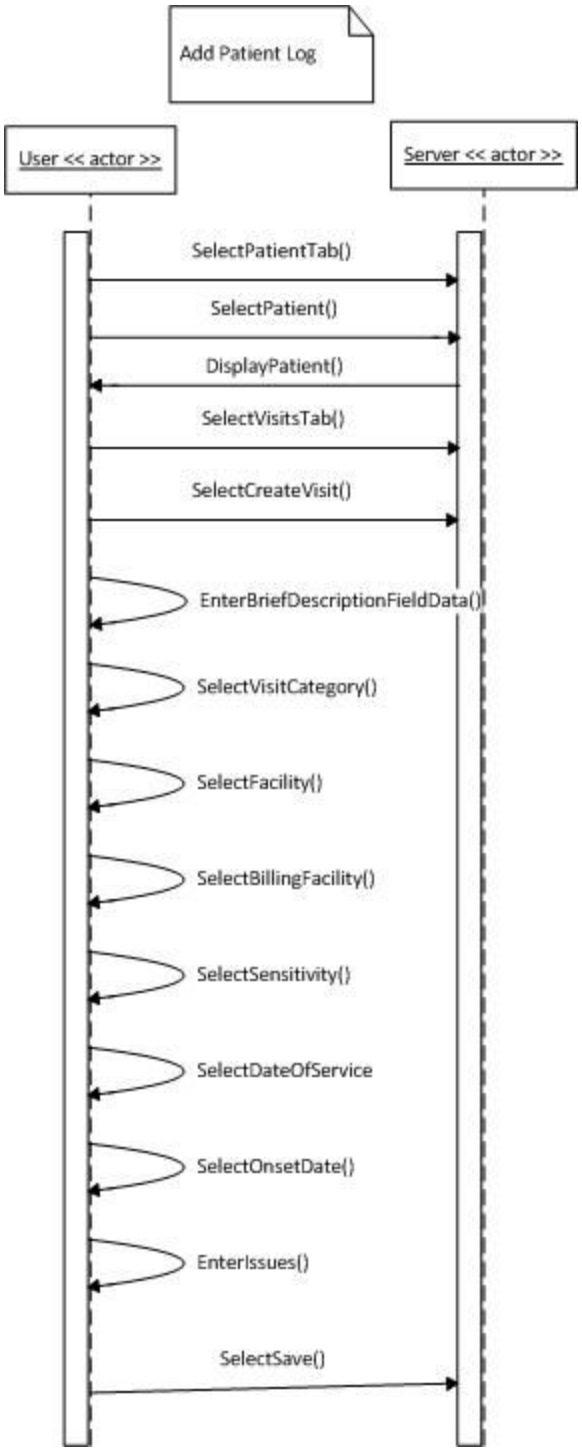
8.6 Create New User



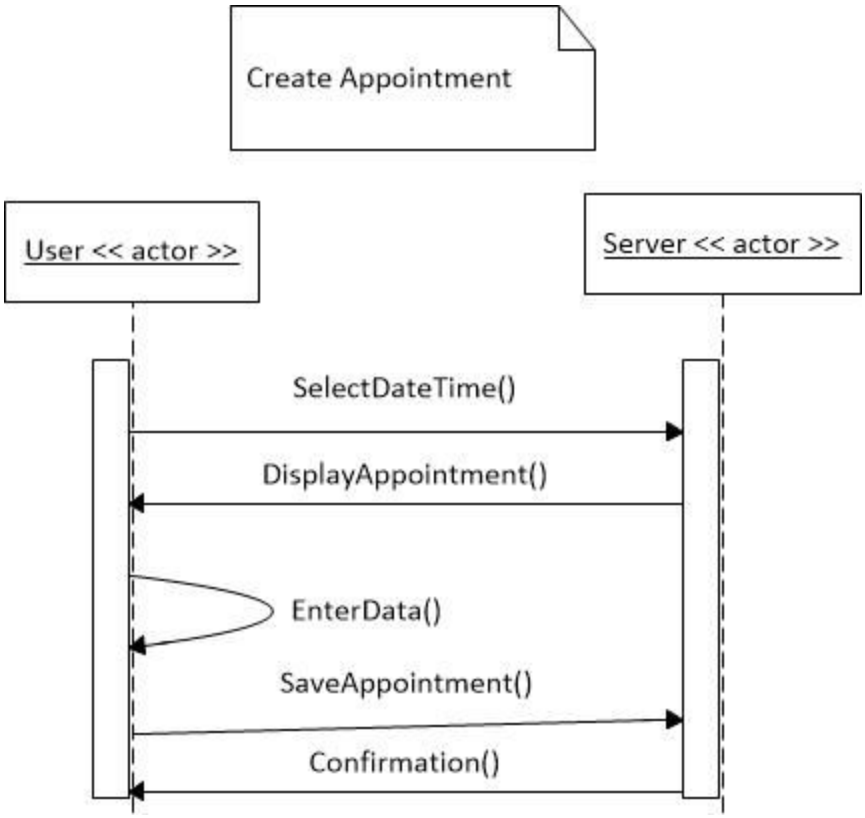
8.7 Edit Visit



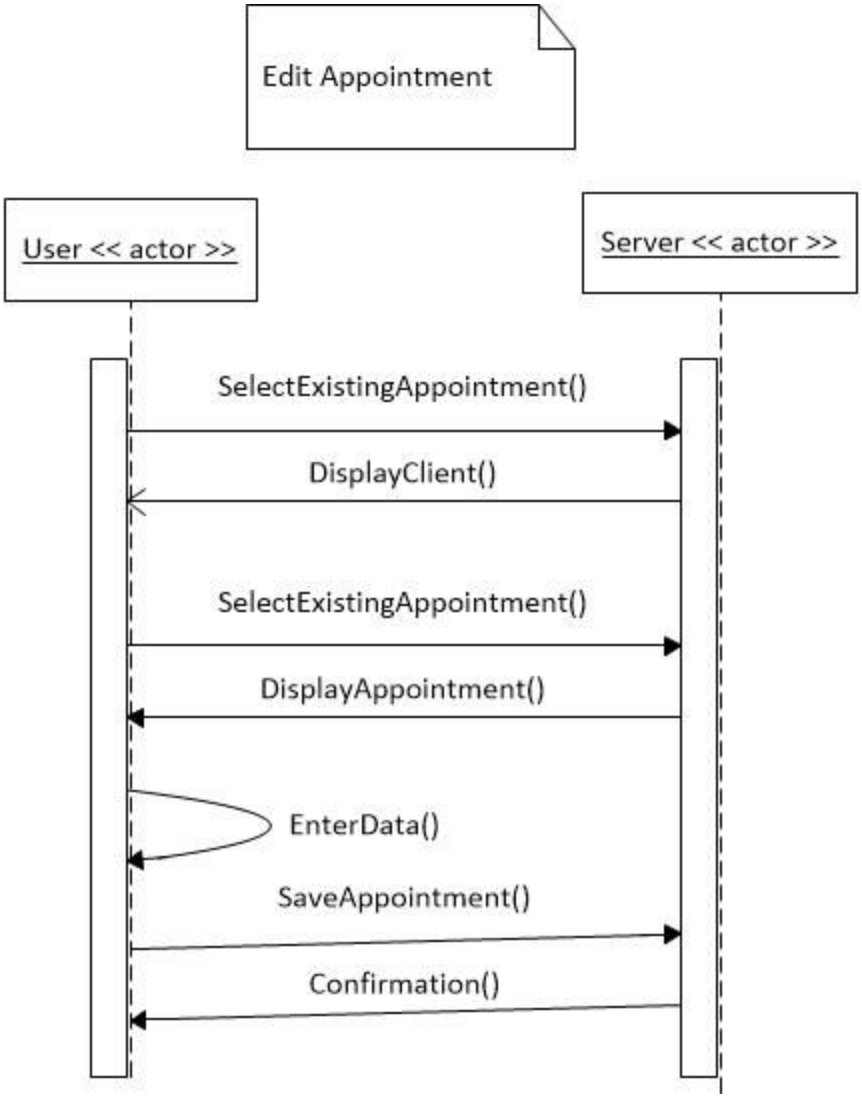
8.8 Add Patient Log



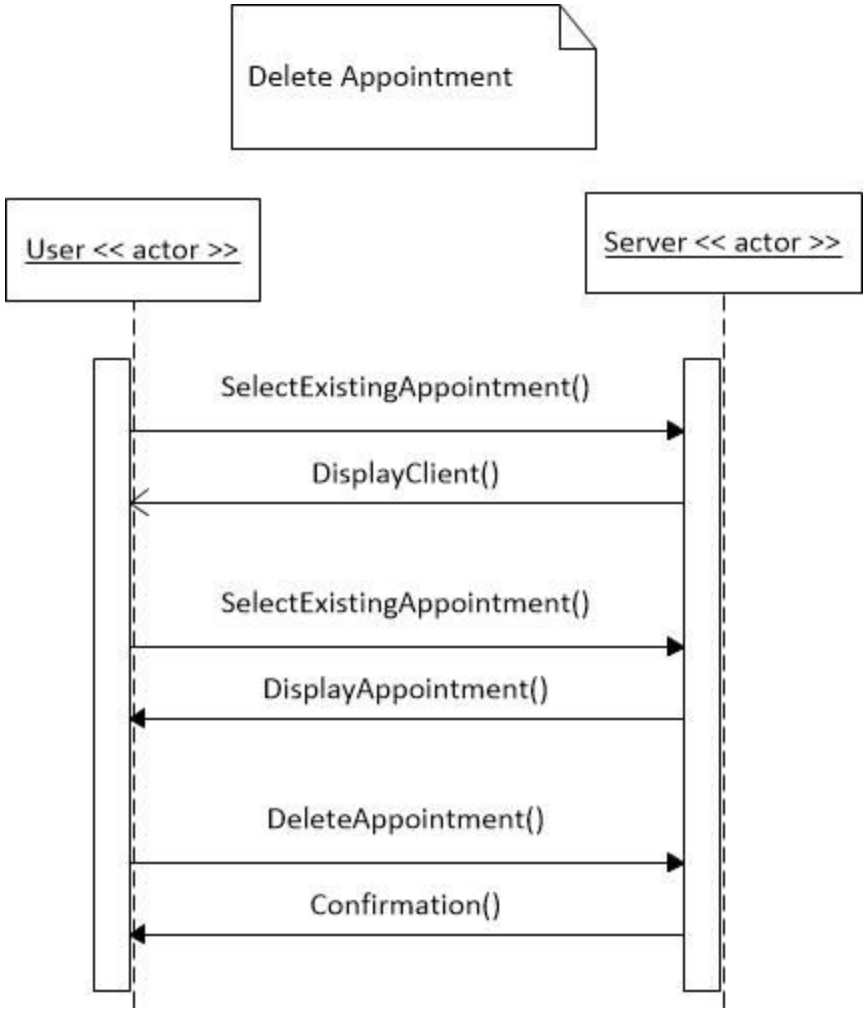
8.9 Create Appointment



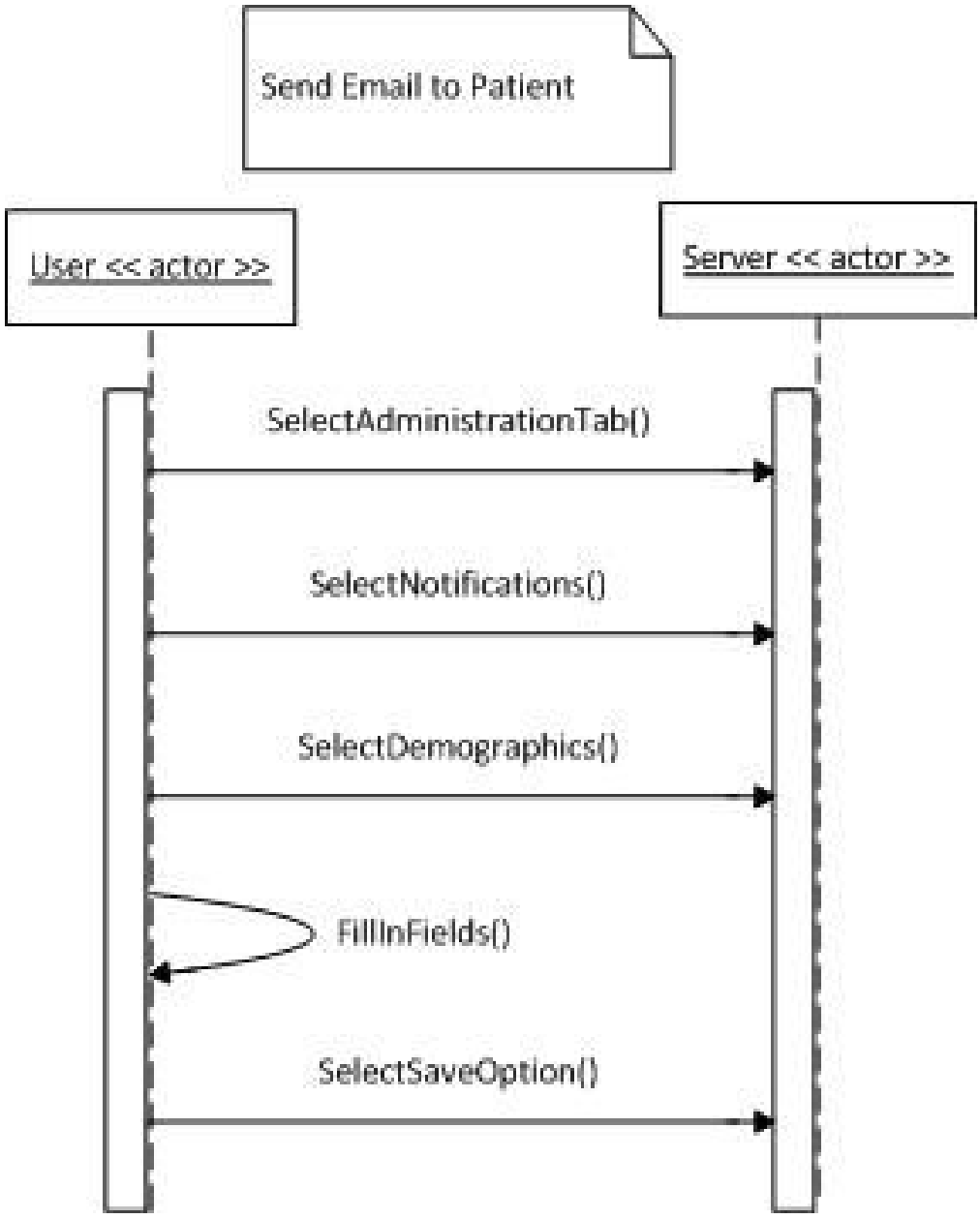
8.10 Edit Appointment



8.11 Delete Appointment

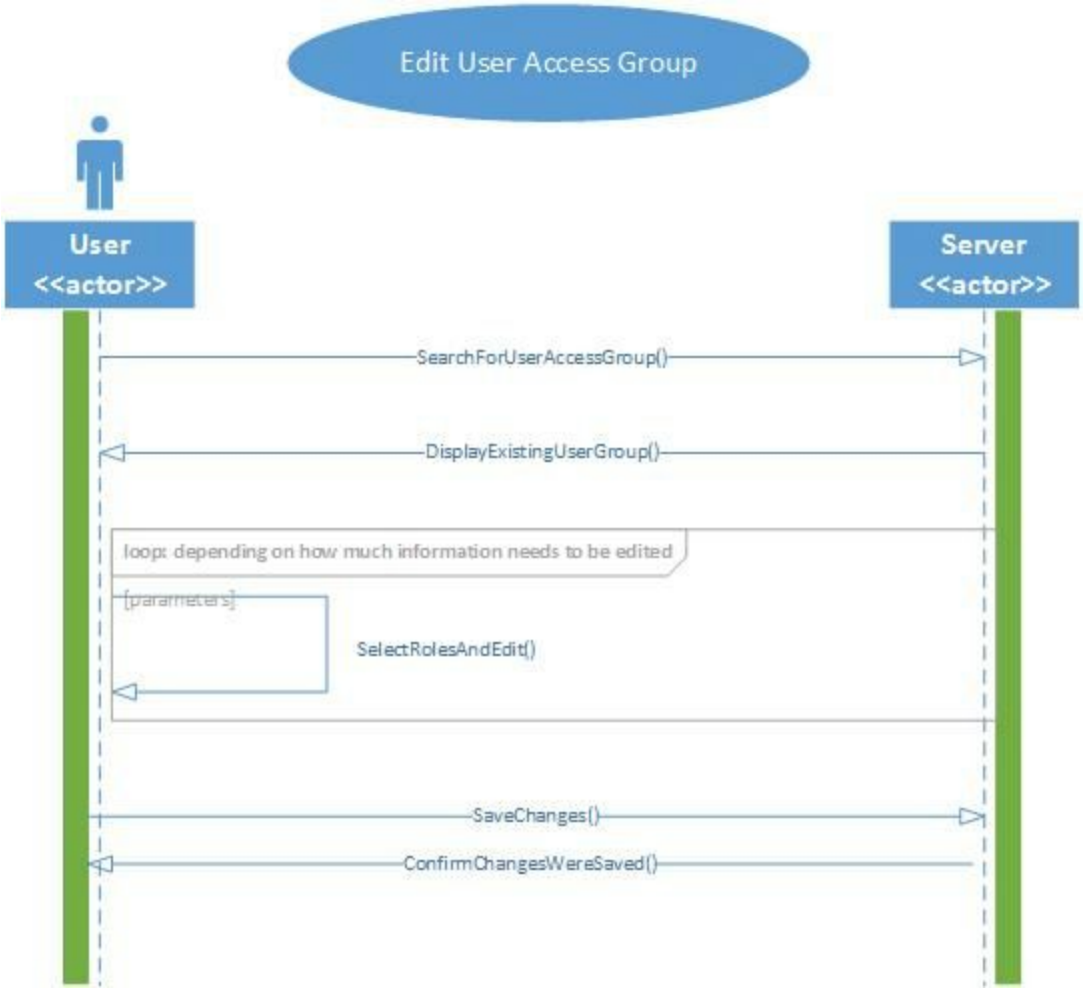


8.12 Edit Client Data Fields

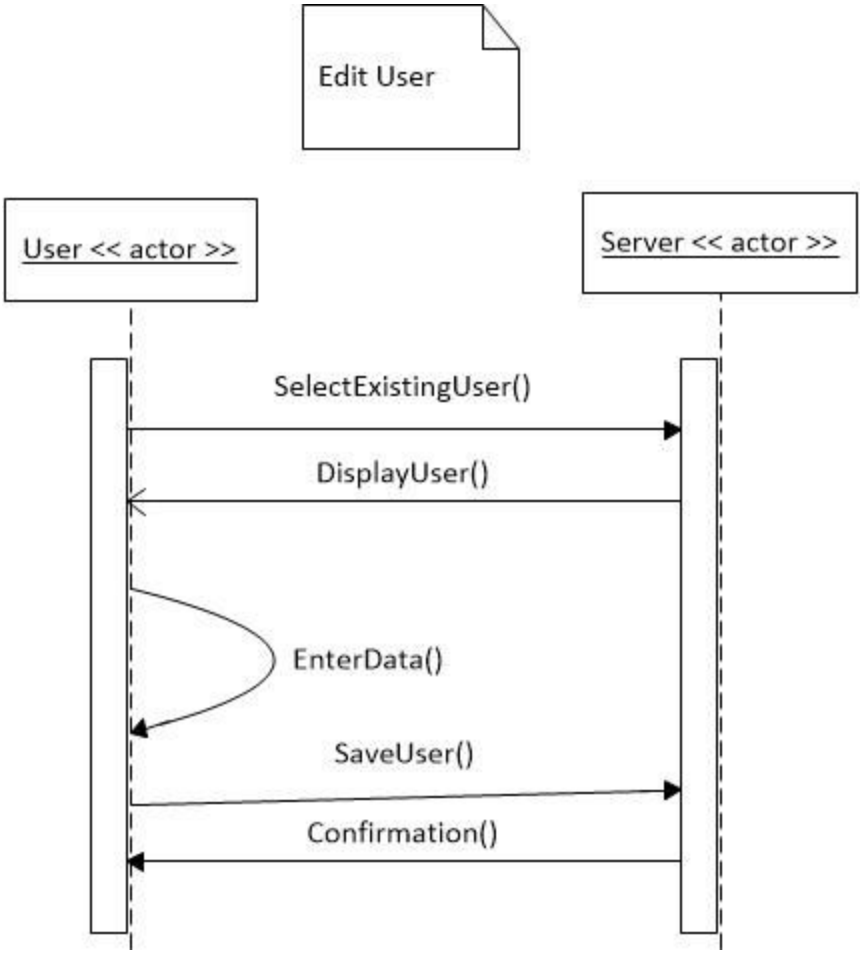


8.13 Edit Access Group

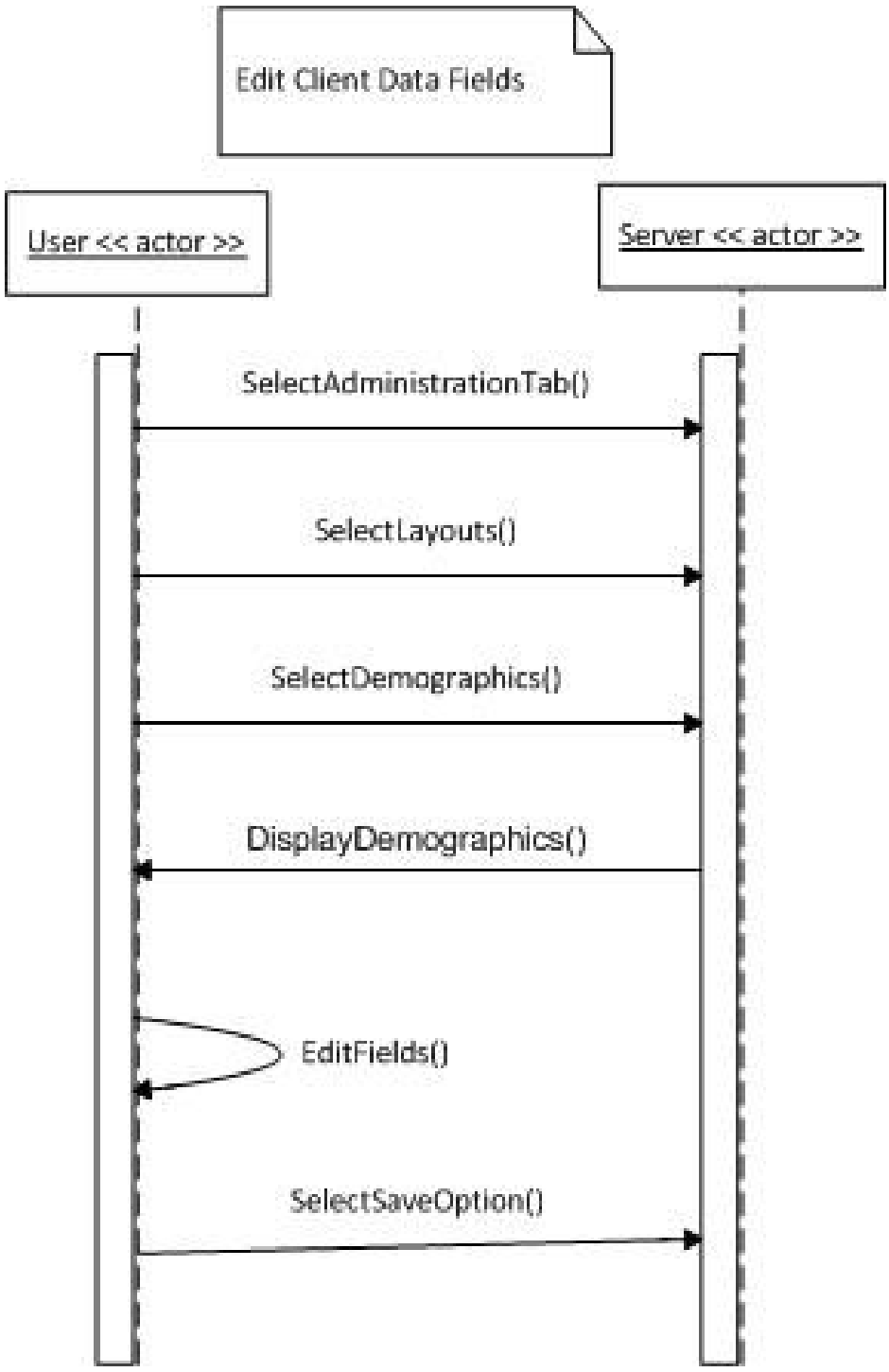
8.14 Edit User Access Group



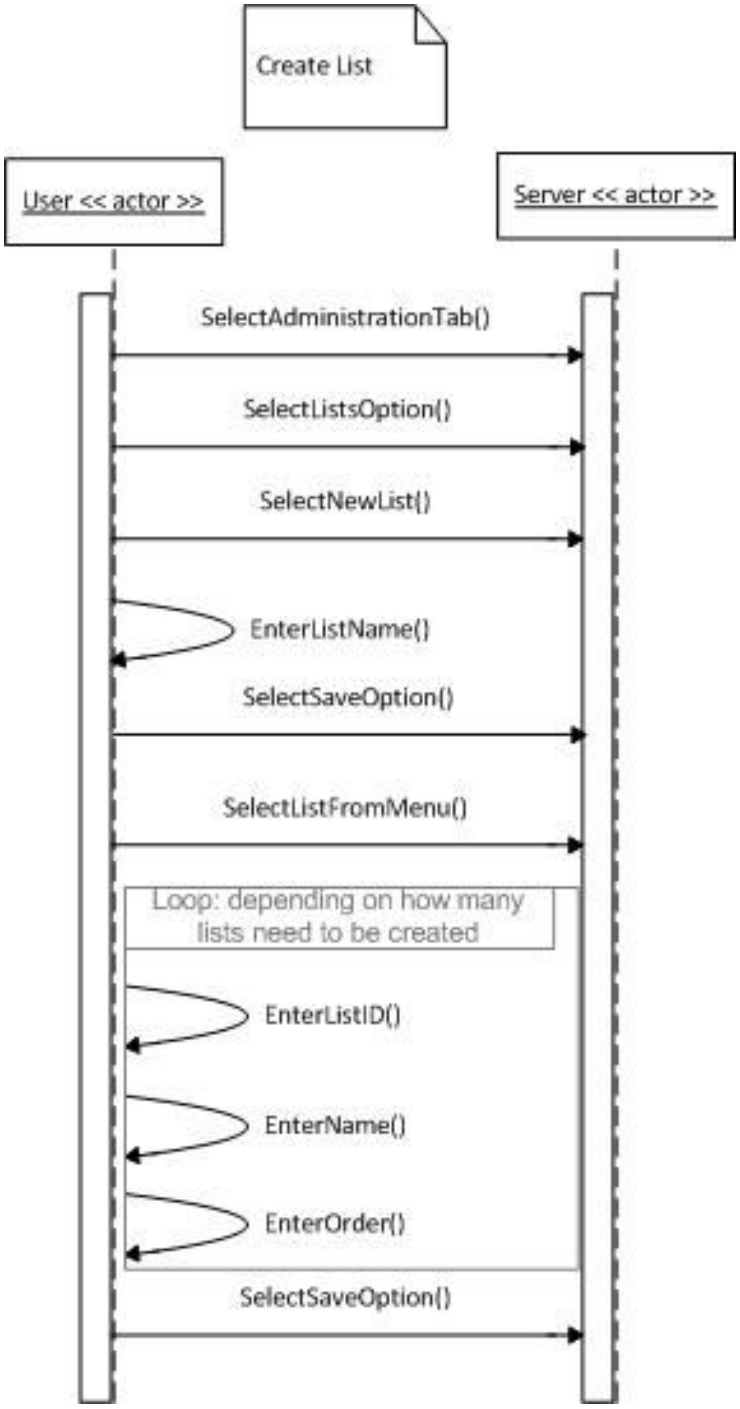
8.15 Edit User



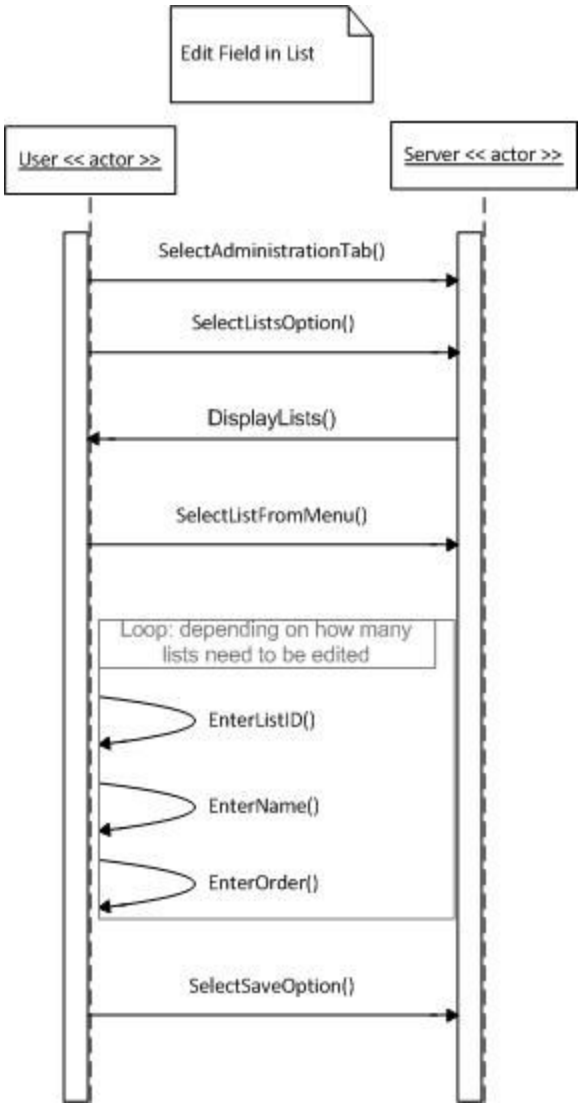
8.16 Edit Data Client Fields



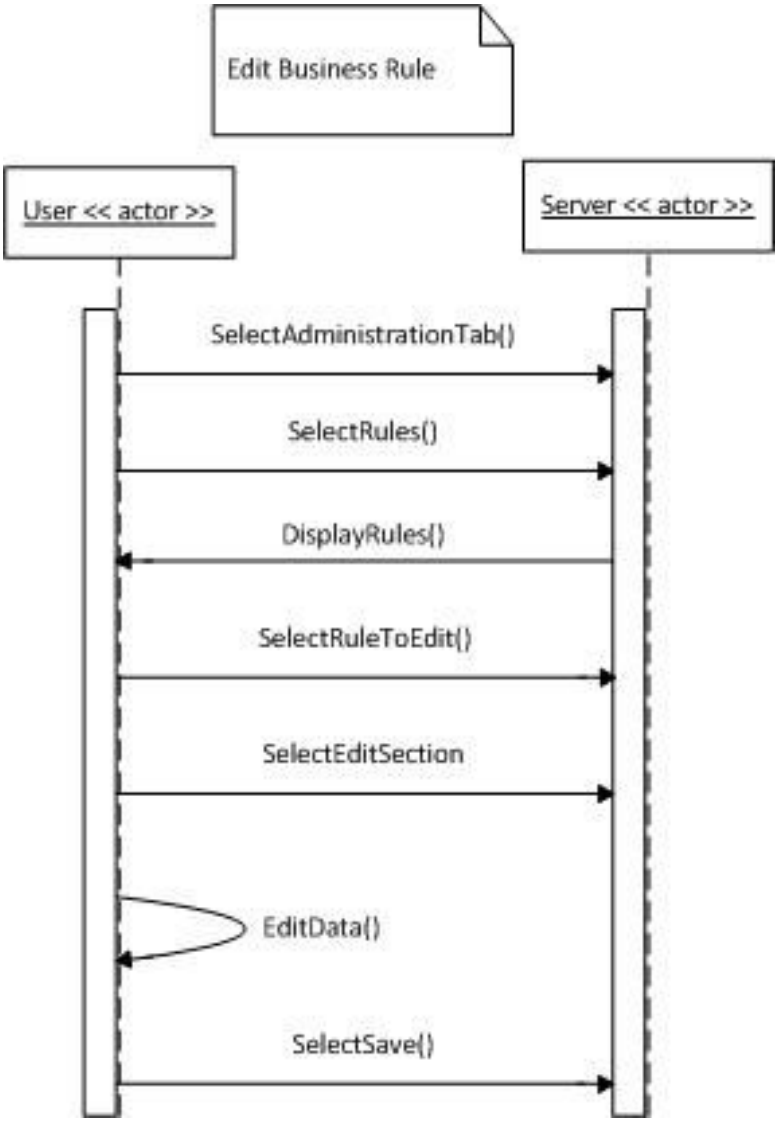
8.17 Create List



8.18 Edit/Add Field to List



8.19 Edit Business Rule



9 Designer Notes

1. There is a thread which discusses a bug with adding a library and instructs on how to fix the bug.
2. E-mail should be implemented to send an automated message to both the therapist and patient, it is not obvious that OpenEMR will handle this natively. An automated e-mail should also be sent to the administrator when any given client completes his/her 8th visit.
3. As is, UC21 *Delete Data Group from Client Demographics*, allows currently used data members to be deleted. Not a good thing.
4. FCS has determined that billing can either be implemented through OpenEMR's billing or simply by reports that can be generated. In the latter case, the sub-admin will transcribe the billing information from the report to their current billing service provider.