Introduction to Database Searching

Why do we do database searches?

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Chilliwack, BC, 2012

Target Audience

1. Those of you that want to learn to write your own searches.

2. Those of you that simply want to learn to use searches that exist and make simple modifications.

Basic Background Knowledge

- Most of the information in an EMR is stored in a database in what are called "Tables"

  (picture a filing cabinet with lots of drawers)

- This is to allow easy retrieval and use of the information

- OSCAR uses MySQL as its opensource database

- **Essentially an EMR is just an interface to the database tables**

  (Picture a secretary and her labeled filing cabinet)

- In the same way that the secretary stands up from her desk and goes to each filing cabinet to retrieve the information that she has filed away, we use electronic tools to do this retrieval.

- They both retrieve the same information, the difference is that the electronic method is way faster and allows more powerful information retrieval

“Please pull all patient’s charts if they are diabetic and not had an A1C lab test in the last 6 months…..”

“I Quit!!!!”

Agenda for today

1) Using premade queries and templates

2) The basics to make/customize your own

Lets start with Reports by Template

- Go to the OSCAR website: http://www.oscarcanada.org/
- OSCAR Users
- EMR and Case Management Resources
- Database report templates

- Here you will find 60 of our most useful Reports by Template
- You can either use them as is, or customize them for specific use for your circumstances

How to upload to your server

- Method 1:

Copy the report that you are wanting and save as a text file (eg in Notepad)

Go to Admin: Report by Template: Add template and then upload

- Method2:

Go to Admin: Report by Template: Add template and then upload multiple instances of the “Blank” report by template.

Then copy the Report by Template that you require.

Open the “Blank” location, Show/hide options, Edit template, Paste the template, Edit

Why method 2??

- When you upload the Report by Templates they come in sequentially, with NO way of ordering later….this way you can have some limited control over the order
- If you want to customize a Report by Template, I open the Template, copy it and paste it onto a blank location and that way I don't lose the original

Running a Report by Template

- Admin
- Report by Template
- Choose the one to run (eg Disease Registry Lookup)
- Insert the variable and run it
- It can be printed or exported to a spreadsheet like excel

SIMPLE!!!!

Query by Example (QBE)

- This is the standard interface to a database table
- I hardly use this interface now that we have Report by Template (except in the production of the Report by Template)

They are essentially the same except Report by Template is the “Cadillac” and has more user friendly features like variable inputs and ability to export and print.

- Go to the OSCAR website: http://www.oscarcanada.org/
- OSCAR Users
- EMR and Case Management Resources
- Query by Example
- Select the one you want: Eg Find children under a certain age
- Copy the Query

- Admin
- Query by Example
- Paste into box
- Query

SIMPLE!!!

Now the theory……

What is a table?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

What is a table?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

Columns

What is a table?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

Rows

What is a table?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

Fields

MMSE

- I want you to remember these three words, and I will later ask you to repeat them to me…..

SELECT

FROM

WHERE

and a few others……

SQL SYNTAX

SELECT	{column name}
FROM	{table name}
WHERE	{= <> > < >= <=}
AND	{both are true}
OR	{one or other or both}
LIMIT	20

Other syntax:

BETWEEN , NOT BETWEEN, LIKE, NOT LIKE, IN, NOT IN,

ORDER BY, GROUP BY, DISTINCT

Want to know who the doctors are?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor_name    FROM    doctors
```

Want to know who the doctors are?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor_name    FROM    doctors
```

Want to see a row?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor#,  doctor_name ,  phone_no,  hair_color
FROM    doctors
WHERE doctor# = 103
```

OR

```
SELECT *  FROM    doctors  WHERE    doctor# = 103
```

Want to see a row?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor#, doctor_name , phone_no, hair_color
 FROM    doctors
WHERE doctor# = 103
OR

SELECT *  FROM    doctors  WHERE    doctor# = 103
```

Want to know who the doctors are with brown hair?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor_name
FROM     doctors
WHERE  hair_color  =  brown
```

Want to know who the doctors are with brown hair?

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

```
SELECT   doctor_name
FROM     doctors
WHERE  hair_color  =  brown
```

So far so good?

- Often information is stored in more than one table with a “key” that connects the two tables

- This is to save duplication of information in the different tables

Example of two tables

residents

resident#	resident_name	hair_color	doctor#	address	postal_code	phone_no
345	Mike	brown	103	Courbould Ave	v2r 2r3	6048245634
456	Cathy	red	244	Mary St	v2r 4t1	6048247933
553	Jake	blond	103	Edwards St	v2r 5w7	6048248332
521	Mary	brown	167	Courbould Ave	v2r 2r3	6048245634

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
244	Dr Ross	6048586778	grey
167	Dr Voth	6048587523	brown
177	Dr Viljoen	6048583458	blond

Another way of looking at it

doctors

doctor#
doctor_name
phone_no
hair_color

residents

resident#
resident_name
hair_color
doctor#
address
postal_code
phone_no

Want to know which residents are working with brown haired doctors?

doctors

doctor#

doctor_name

phone_no

hair_color

residents

resident#

resident_name

hair_color

doctor#

address

postal_code

phone_no

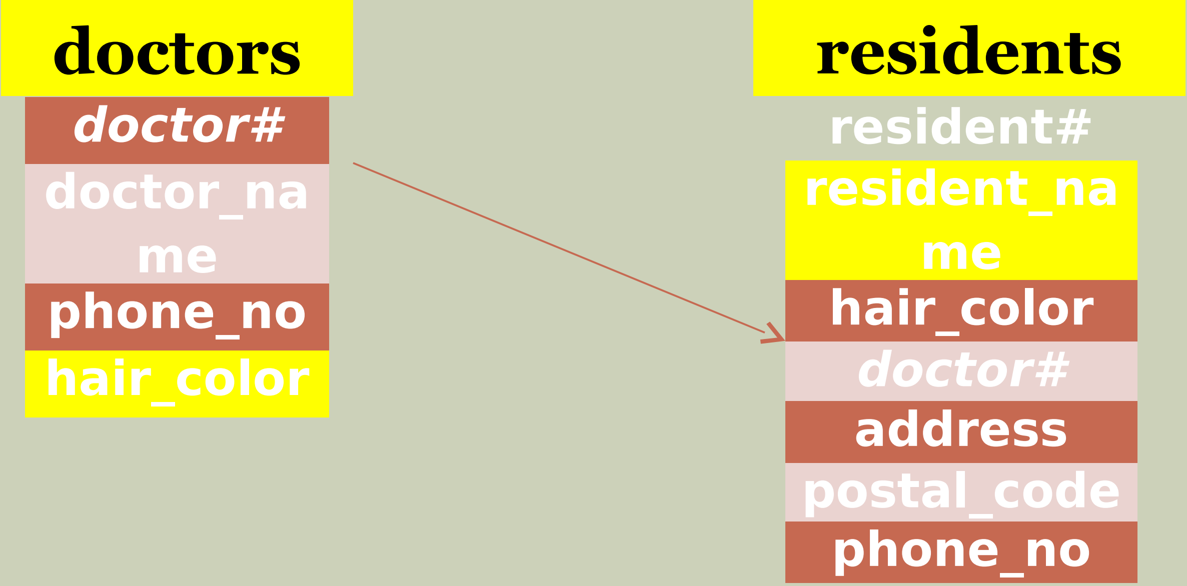
```
SELECT resident_name
FROM  residents,    doctors
WHERE  hair_color = brown
```

Why won't this work?

- You need to LINK the tables
- And you need to give each column a UNIQUE name

Otherwise the computer will produce and infinite number of permutations and combinations……

Want to know which residents are working with brown haired doctors?



doctors

doctor#

doctor_name

phone_no

hair_color

residents

resident#

resident_name

hair_color

doctor#

address

postal_code

phone_no

```
SELECT residents.resident_name
FROM    residents,      doctors
WHERE  doctors.hair_color  =  brown
AND resident.doctor#  =  doctors.doctor#
```

residents

resident#	resident_name	hair_color	doctor#	address	postal_code	phone_no
345	Mike	brown	103	Courbould	v2r 2r3	6048245634
456	Cathy	red	244	Courbould	v2r 2r3	6048245634
553	Jake	blond	103	Courbould	v2r 2r3	6048245634
521	Mary	brown	167	Courbould	v2r 2r3	6048245634

doctors

doctor#	doctor_name	phone_no	hair_color
103	Dr Smith	6048585756	brown
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```
SELECT residents.resident_name   FROM
residents,     doctors
WHERE  doctors.hair_color  =  brown
AND resident.doctor#  =  doctors.doctor#
```

Aliases- a convenient abbreviation

```
SELECT r.resident_name

FROM  residents r,     doctors d

WHERE  d.hair_color  =  brown

AND  r.doctor#  =   d.doctor#
```

```
SELECT residents.resident_name
FROM  residents,     doctors
WHERE  doctors.hair_color  =  brown
AND resident.doctor#  =  doctors.doctor#
```

Enough theory, lets do some hands on

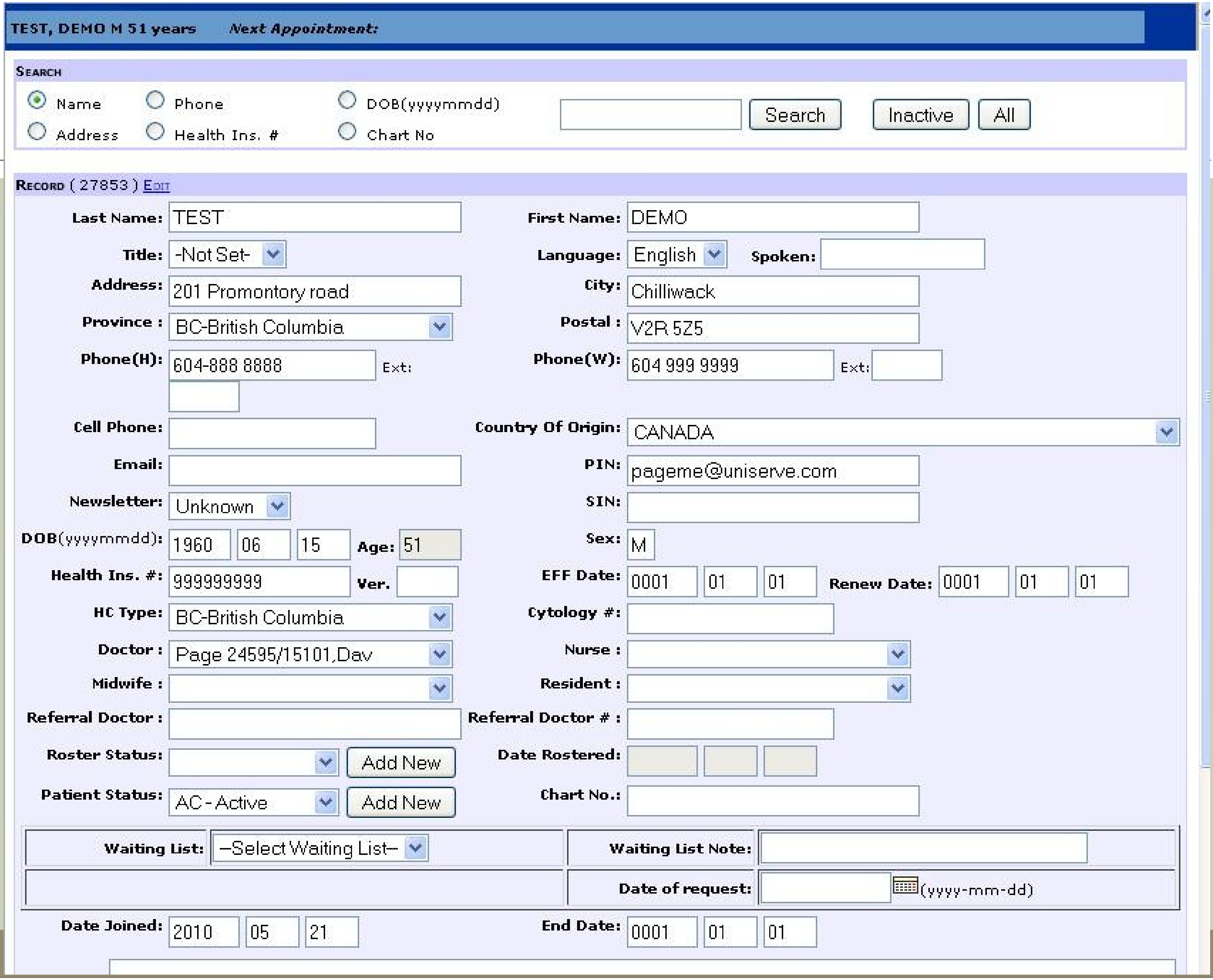
- From appointment screen in OSCAR
- Admin
- oscarReport
- Query by Example

show tables;

This will display all the tables in OSCAR

Commonly used tables in OSCAR

- demographic
- eChart
- dxresearch
- drugs
- measurements
- appointment
- billing
- billingmaster
- provider
- preventions



TEST, DEMO M 51 years *Next Appointment:*

Search

● Name ○ Phone ○ DOB(yyyymmdd)
○ Address ○ Health Ins. # ○ Chart No

Record (27853) Edit

Last Name:	TEST	First Name:	DEMO
Title:	-Not Set-	Language:	English Spoken:
Address:	201 Promontory road	City:	Chilliwack
Province :	BC-British Columbia	Postal :	V2R 5Z5
Phone(H):	604-888 8888 Ext:	Phone(W):	604 999 9999 Ext:
Cell Phone:		Country Of Origin:	CANADA
Email:		PIN:	pageme@uniserve.com
Newsletter:	Unknown	SIN:	
DOB(yyyymmdd):	1960 06 15 Age: 51	Sex:	M
Health Ins. #:	999999999 Ver.	EFF Date:	0001 01 01 Renew Date: 0001 01 01
HC Type:	BC-British Columbia	Cytology #:	
Doctor :	Page 24595/15101,Dav	Nurse :	
Midwife :		Resident :	
Referral Doctor :		Referral Doctor # :	
Roster Status:		Date Rostered:	
Patient Status:	AC - Active	Chart No.:	
Waiting List:	--Select Waiting List--	Waiting List Note:	
		Date of request:	(yyyy-mm-dd)
Date Joined:	2010 05 21	End Date:	0001 01 01

describe {table};

This will list the columns in that particular table
(eg demographic, look at a patients demographics page first)

describe demographic;

Lets ask some questions

- First let us see what is in the demographic table

(refer to the demographic table property handout)

```
select  *
from  demographic
limit 20
```

(* = select all)

```
select first_name, last_name
from demographic
limit 20
```

Let us find the patients older than 100!

```
select first_name, last_name
from demographic
where year_of_birth < 1911
limit 200;
```

Let us filter out the 0000-00-00

```
select first_name,  last_name
from  demographic
where  year_of_birth  <  1911
and  year_of_birth  <>  0000
limit  200;
```

Lets only look at the active patients

```
select first_name,  last_name
from demographic
where year_of_birth < 1911
and year_of_birth <> 0000
and patient_status = 'AC’
limit 200;
```

Doing Arithmetic with selected Information

SYNTAX

*   /   -   +

MAX   MIN

SUM

AVG

COUNT

Want to find your oldest patient?

```
select min(year_of_birth)
from demographic
where year_of_birth <>0000
and patient_status = 'AC';
```

Then

```
select first_name, last_name
from demographic
where year_of_birth = 1904
and patient_status = 'AC';
```

Some more interesting searches…

1) What is the average year of birth of our patients?

```sql
select avg(year_of_birth) from demographic where patient_status = 'AC';
```

2) What is the sum of our patients year of births?

```sql
select sum(year_of_birth) from demographic where patient_status = 'AC';
```

3) How many patients are listed as active in our server?

```sql
select count(demographic_no) from demographic where patient_status = 'AC';
```

Now lets try using two tables…

- Let us list all our patients that have been entered into the Disease Registry with CHF (ICD 428)

(refer to the dxresearch table properties)

```
select demographic_no
 from dxresearch
where dxresearch_code = 428;
```

This works, but we want names….

```
select demo.first_name,   demo.last_name
from dxresearch dx,   demographic demo
where  dx.dxresearch_code  =  428
and  dx.demographic_no  =  demo.demographic_no;
```

Now to the Cadillac of searches, “Report by Templates”

This is a Query by Example engine with two differences:

1. It allows easy export of the results to a spreadsheet like Excel
2. It allows “variable inputs”

Now to the Cadillac of searches, “Report by Templates”

This is a Query by Example engine with two differences:

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2. It allows “variable inputs”

Basic structure of a Report by template

```
<report title="Title" description="Description of what the report  does" active="1">

    <query>

            Place query here

     </query>


  <param id="name"  type="(text)(list)(date)" description="Description">

  </param>


</report>
```

This is the type of input

So this is how the Disease Registry search would look:

```
<report title="Disease Registry lookup"    description="Search for patients in the Disease Registry by ICD 9 code" active="1">

<query>

select demo.first_name, demo.last_name
from dxresearch d,demographic demo
where d.dxresearch_code = 428
and d.demographic_no = demo.demographic_no;

</query>

<param id="searchtext" type="text" description="ICD 9 code">  </param>

</report>
```

Paste in Query

So this is how the Disease Registry search would look:

```
<report title="Disease Registry lookup" description="Search for patients in the Disease Registry by ICD 9 code" active="1">

<query>

select demo.first_name "First Name", demo.last_name "Last Name"
from dxresearch d,demographic demo
where d.dxresearch_code = {ICD9}
and d.demographic_no = demo.demographic_no;

</query>

<param id="ICD9" type="text" description="ICD 9 code">  </param>

</report>
```

Variable text input id-can be any name you choose

Wrap up

Hopefully you now know:

- How to list the Tables

  (show tables;)

- How to see the columns in a particular Table

  (describe {table name};)

- How to retrieve data from a Table

  (Select {**column name**} From {**table name**} Where {**filter**};)

- How to insert the Query into a Report by Template
- How to upload and edit “Reports by Template”

The End