**Clinical Data Exercises using LibreHealth EHR**

1. Login to demo: <https://libreehr-edu.mi-squared.com/interface/login/login.php?site=msud>
   1. Username = admin; password = password
2. Click on the small x to close the calendar and click on the lock to minimize the Patient Finder
3. In the top Menu, select Reports, scroll down to Clients and then select Demographics vs. Diagnosis

**Scenario #1 Teleretinopathy**

1. You are the senior physician in a 5-person primary care practice 30 minutes north of Austin, Texas. You read this week that a recent [study from the Dell Medical School at UT Austin](http://www.retinalscreenings.com/news/resources/diabetic-retinopathy-telemedicine-screening-could-greatly-benefit-underserved) using teleretinal screening in the office detected a rate of diabetic retinopathy of 20.5% and a high compliance rate. You have a significant number of rural and underserved minorities in your practice and are concerned that the screening rate is too low. Fortunately, there is a new teleretinal screening service called [Intelligent Retinal Imaging Systems (IRIS)](http://www.retinalscreenings.com/) that can place the software and hardware in the office and integrate with the electronic health record (EHR). Images taken are sent to a local retinal expert for interpreation.
2. After discussion with the other clinic clinicians you opt to start with older adults as they often have transportation and compliance issues and start with those with known retinopathy. The first step is to identify all patients who have diabetic retinopathy. For demonstration purposes we will search only for diabetic retinopathy without macular edema.
3. For Age Min type in 55, for Age Max type in 75. Refresh query. You can search for type 2 diabetes in the box labeled Problem Dx but to save time the ICD-10 code we are going to use is E11.319. Type that in the box above ICD10
   1. Scroll down and you will see that there are 71 patients identified. This is your beta test group and you will invite them to participate with a letter or email. If successful you can expand this group down the road.

**Scenario #2 Asthma in African American teenagers**

1. You are the Chief Medical Information Officer of a large managed care organization in Houston Texas and as such you meet with the CIO, CEO and Quality Department on a regular basis. The emergency room staff are under the impression that they are seeing an unusually high incidence of asthma exacerbations in African American teenagers. You do a [literature search](https://www.mdedge.com/ccjm/article/95718/pulmonology/asthma-african-americans-what-can-we-do-about-higher-rates-disease) and realize that this problem is real. Your team requests that you query the EHR for your system to see if asthma is more common in African American teenagers, compared to whites and if so, create an asthma registry and design an evidence-based disease management program for the institution.
2. Use the Demographics vs. Diagnosis report
3. Set Age Min = 11, Age Max = 19. Select Refresh Query
4. Above Ethnicity in the empty box insert Non-Hispanic Black
5. In the box above ICD10 insert J45.20 which is mild intermittent asthma as your team wants to identify mild asthmatics to start with. Scroll down and you will find you have identified 105 patients (out of total of 303) (35%)
6. Change the Ethnicity to Non-Hispanic White and note you have identified 82 patients (out of a total of 303) (27%)
7. Your organization has an enrolment of 16% African American patients, so you have confirmed that asthma is more common in African American teenagers and you will help design a disease management program.

**Scenario #3 Diabetic Management in Mexican Americans with type 2 diabetes**

1. There is an [American Diabetic Association Program](http://www.diabetes.org/in-my-community/awareness-programs/latino-programs/) to identify all Mexican-American women of child bearing age who have known or undiagnosed type 2 diabetes to improve the control of their diabetes. Type 2 diabetes is much more common in Hispanic women and it can negatively affect their current or future pregnancies.
2. You are the senior physician of a 6-person primary care practice in Laredo Texas and your goal is to use EHR data to identify all Mexican American women with probable type 2 diabetes, so you can refer them to an Endocrinologist under this new program.
3. Reports >> Clients >> Demographics vs Lab Results (it may take a while to pull up all lab results)
4. On the main page input Min Age = 16 and Max Age = 50. Refresh Query
5. Above gender in the open box type in F for female
6. Above Ethnicity type in Mexican
7. Above Test type in Glycohemoglobin. This test is also known as hemoglobin A1c or A1c for short. Anyone with a glycohemoglobin above 6.5 probably has diabetes and if over 8 the diabetes is poorly controlled. Scroll to the bottom and you will see that 211 tests were done in Mexican American women.
8. Scroll down and go to page #3. You will note that six individuals have glycohemoglobins of 8 or greater and these women will be referred to the Endocrinologist. The patient IDs for these patients were: 3812, 141, 9205, 7971, 5106 and 4059.
9. Using the patient IDs, go back to patient finder. Open each chart and see if they have the diagnosis of type 2 diabetes and see if they are on any mediations for diabetes

**Scenario #4 Improving referrals to Nephrologists**

1. You are the Chief Medical Officer at the Texas A&M University College of Medicine, College Station-Bryan
2. Your team has identified chronic kidney disease as an expensive chronic disease that should be better managed.
3. 42% of patients who need dialysis were not seen prior by a kidney expert (Nephrologist). 1 The large managed care organization (Kaiser-Permanente) realized that this was happening, and they reviewed EHR data which was shared for the entire North West US region and any patient with abnormal kidney (renal) lab tests was referred to the Nephrologist without a primary care physician’s referral. 2 Any patient who had a urine protein (albumin) to creatinine ratio of greater than 300 mg/gram should be referred to a Nephrologist, regardless of renal function measured by the blood test (creatinine). Fortunately, your organization has been routinely testing urine albumin to creatinine ratios.
4. Your objective then is to analyze your EHR data to find those people who spill an abnormally high amount of protein in the urine and referral them to a Nephrologist.
5. You will again be using the Demographics vs. Lab Results report (it may take 1-2 minutes to pull up all of the lab results)
6. We could of course search for the ICD-10 diagnosis of chronic renal insufficiency (N18.9), but we will take a different tact.
7. In the box above Test type in Urine albumin, scroll down and you will see 7634 results. What you want to know is how many patients have a urine albumin/creatinine ratio of 300 or more. Click on the word Result and it will filter low to high results. Scroll to the bottom and keep scrolling until you can identify those patients with urine albumin/creatinine ratio of 300 or more. There are several pages of these patients. These patients need referral to the Nephrologist.
8. One could also examine these patients in Patient Finder to see what their underlying diagnoses were. In all likelihood diabetes and hypertension would be most common.

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1. USRDS 2013 Annual Data Report: Table 1.f (Volume 2)
2. Lee B, et al. Effects of proactive population-based nephrologist oversight on progression of chronic kidney disease: a retrospective control analysis. Bmc Health Services Research. 2012;12
3. Definition, classification and prognosis of CKD Kidney Int 2011;80:17-28 <https://www.ncbi.nlm.nih.gov/pubmed/21150873>