

## Case Description for Chicago Mental Health Services (CMHS)

### Develop an EER diagram to model the following case:

(SEE NOTE ON SHOWING SUBTYPE DISCRIMINATORS AT THE END OF THE ASSIGNMENT.)

In response to government cutbacks to mental health services, CMHS was established to fill in the gaps for services no longer covered by Medicaid. An amazing group of people are working together to provide services, including a staff of Licensed Mental Health Counselors (LMHCs) and social workers; a network of medical professionals; religious organizations; volunteers, and donors/fundraisers. Clinical Social Workers provide an array of social services, and they are allowed to apply for Medicare reimbursement. They coordinate with the LMHCs, who provide counseling and therapy. (LMHCs are not allowed to apply for Medicare reimbursement.) LMHCs who are not yet Licensed Clinical Professional Counselors (LCPCs) work under the supervision of an LCPC while earning their clinical hours. But LCPCs can provide psychotherapy and counseling unsupervised. LMHCs and social workers and refer clients to appropriate medical professionals, as needed. Religious organizations provide shelters and soup kitchens which are staffed by volunteers, who often include some of the staff of CMHS, and even some of the wealthy donors. Volunteers and religious organizations provide all manner of services, such as driving patients to appointments, and more. Clients and former clients who are in a position to help out will sometimes volunteer as well. It is truly a community effort to help the less fortunate.

Medical professionals include psychiatrists, who can prescribe medicine and monitor patient progress; diagnostic lab testing centers, who offer lab tests at reduced cost; hospitals, who can provide emergency care as well as in-patient psychiatric hospitalization; and primary care physicians, to oversee overall patient care. In addition, there are therapists, including physical and occupational therapists, and even massage therapists, for stress reduction, as well as other medical professionals. All medical professionals bill through CMHS social workers, who handle the billing through Medicare, Medicaid, private insurance (if any) and then by contacting the donors and fundraisers. These donors and fundraisers cover the medical bills that are no longer covered after Medicare and Medicaid have paid their part of the bill.

The staff also help their clients navigate social security, DMV, housing authorities and other government agencies. Most of the agencies are dealt with very similarly, except for Social Security Disability, since CMHS will often be the client's "payee" for disability payments. This means that CMHS will receive the client's payment and help the client with their essential payments (food, rent, etc.) and with budgeting.

Client: ClientID, client name, contact info, date joined CMHS.

CaseWorkers: ID, name, contact info, academic degree, date hired

LCPC: date of licensure

Clinical social workers: Medicare billing ID

Government Agencies: ID, name, contact person; contact information

Religious organizations: ID, contact name; contact info; services provided; limitations on services (hours available, limit on numbers of days or so forth)

Services: Service ID; name of service; type of service; list of entities who can perform that service (for instance, anyone can drive a client to an appointment, but only a physician can prescribe medication)

Medical Professionals: ID; Name, contact info, Type of professional; license number;

Donors and Fundraisers: ID, Name, contact info, availability

Volunteer: Name, contact info, type of services provided

Your main challenges are to capture the structure of the different people providing services, and also to track the services themselves: what service has been provided (including the date), to which client, by whom, and any comment about that service.

However, this goes beyond just the modeling. This is an exercise in Requirements Analysis as well. You will have some questions about the requirements themselves. Sure, you can ask me, but it's better if you make an assumption (a reasonable one, and make it clearly and precisely) and then construct your diagram consistent with that assumption. But don't make an assumption that directly contradicts something stated in the description. For example, you can't make an assumption that only social workers can provide services to clients. This flatly contradicts the text description. However, you could make an assumption that only religious organizations provide soup kitchens, and then you could model that specialization consistently with that assumption.

Model the above case in two ways (create two separate EER diagrams):

1. Specialized services, such as providing medication, soup kitchens and anything else mentioned specifically, should be modeled as specializations whenever appropriate. (That means, whenever there is a special attribute or special relationship associated with a specific service, try to model it as a specialization if at all appropriate.) This goes beyond services: only social workers can apply for medicare reimbursement; only LCPCs can provide unsupervised therapy.
2. All services should be combined into one entity, named Services. What attributes would be needed to make the necessary distinctions between the types of services that might be provided by different providers. And as in point #1, above, this can go beyond services into other areas of the EER diagram as well.

The above case description was written in English. Words were used the way they are normally spoken in English, not specifically in database-speak. So be careful to interpret the language from the user perspective, and then translate to your database model.

Subtype discriminators are best shown as below. Show the attribute that determines the classes (in this case, EmployeeType), and then on the different branches you can show the values of that attribute that classify an instance into one of those classes. So, for instance, in Problem 3 above, you can put "Gold" and "Platinum" on the branch that leads to the "Preferred" class of customer.

