Assumptions:

Artificial keys:

1. *DateTime* is natural partial key for Appointments, Information Sessions, Notes and Babies.

2. Medical tests are determined by their *test id*.

3. Parents are determined by their *parent id*.

4. Fathers are determined by their *father id*.

5. Pregnancies have the *times of couple's pregnancy* as their partial key.

6. Appointments are determined by their *appointment id*.

Other assumptions:

1. A mother could attend multiple appointments, but she should attend at least one appointment to set the expected due date based on her last menstrual period and to decide the final estimated due date.

2. Similarly, a mother should take at least one medical test, ultrasound test, to estimate another expected due date.

3. Only parents that express interest with the program would be assigned with one midwife and a backup midwife.

4. An appointment can be set for one pair of parents.

5. A medical test can be taken by exactly one mother.

6. There exists global authority to create global identifiers for Medical Tests and

Restrictions:

1. A midwife is associated with exactly one health institutions (either a clinic or a birthing center).

2. Parents are assigned with at most one specific midwife (the parents who express interest), as well as a backup midwife.

4. Parents should attend at least one information sessions.

5. An information session is hosted by one of the midwifes while a midwife can host multiple sessions.

6. An appointment is set for one couple while a couple can attend multiple appointments.

7. Each appointment is set by one midwife.

7. Multiple notes are associated with an appointment, and each note is associated with exactly one appointment.

10. A medical test is conducted by exactly one lab technician while a technician could conduct multiple tests.

11. Multiple medical tests can determine the number of babies and their gender, blood type and date of birth (and time).

12. A medical test is conducted for exactly one mother while a mother can take multiple medical tests.

13. Multiple medical tests can be prepared during an appointment, but a test is prescribed by one appointment.

14. Parents are consisting of one mother and at most one father.

15. Each pair of parents could have multiple pregnancies while a pregnancy belongs to exactly one couple.

16. A pregnancy could give birth for multiple babies while a baby is born in exactly one pregnancy.

Relational Translation:

Entities:

1. Midwives (midwife name, midwife email, midwife phone number, <u>midwife practitioner id</u>)

2. Health Institutions (HI name, <u>HI email</u>, HI phone number, HI website)

3. Clinics (<u>HI email</u>)

4. Birthing Centers (<u>HI email</u>, birthing facilities)

5. Parents (<u>parent id</u>)

6. Technicians (<u>t id</u>, t name, t phone number)

7. Mothers (m name, <u>m hcardid</u>, m date of birth, m address, m phone number, m email, m profession, expected time of birth)

8. Fathers (<u>father id</u>, f name, f hcardid, f date of birth, f address, f phone number, f email, f profession)

9. Appointment (<u>appointment id</u>, aDateTime)

10. Medical Tests (<u>test id</u>, type, test prescribed date, sample taken date, lab work done date, result)

Weak Entities:

1. Information Sessions (<u>midwife practitioner id</u>, <u>ISDateTime</u>, language, attendance)

2. Notes (<u>appointment id</u>, <u>nDateTime</u>)

3. Pregnancies (<u>parent id</u>, <u>pregnancy times</u>, location, mother's blood type, father's blood type)

4. Babies (<u>pregnancy times</u>, <u>DateTime of birth</u>, gender, blood type, bname)

Relationship:

1. works at (<u>midwife practitioner id</u>, HI email)

 midwife practitioner id is a foreign key referring to Midwives

 HI email is a foreign key referring to Health Institutions

2. sets (<u>aDateTime</u>, midwife practitioner id)

 aDateTime is a foreign key referring to Appointments

 midwife practitioner id is a foreign key referring to Midwives

3. hosts (<u>ISDateTime</u>, midwife practitioner id)

 ISDateTime is a foreign key referring to Information sessions

 midwife practitioner id is a foreign key referring to Midwives

4. assigns (<u>parent id</u>, midwife practitioner id)

 parent id is a foreign key referring to Parents

 midwife practitioner id is a foreign key referring to Midwives

5. backups (<u>parent id</u>, midwife practitioner id)

 parent id is a foreign key referring to Parents

 midwife practitioner id is a foreign key referring to Midwives

6. attends info session (<u>parent id</u>, <u>midwife practitioner id</u>, <u>ISDateTime</u>)

parent id is a foreign key referring to Parents

midwife practitioner id is a foreign key referring to Information Session

7. attends appointment (<u>appointment id</u>, parent id)

  parent id is a foreign key referring to Parents

  appointment id is a foreign key referring to Appointments

8. associates (<u>nDateTime</u>, appointment id)

  nDateTime is a foreign key referring to Notes

  appointment id is a foreign key referring to Appointments

9. prepares (<u>test id</u>, appointment id)

  test id is a foreign key referring to Medical Tests

  appointment id is a foreign key referring to Appointments

10. conducts (<u>test id</u>, technician id)

  test id is a foreign key referring to Medical Tests

  technician id is a foreign key referring to Technicians

11. determines (<u>test id</u>, pregnancy times, DateTime of birth)

  test id is a foreign key referring to Medical Tests

  pregnancy times is a foreign key for Babies

12. borns (<u>DateTime of birth</u>, parent id, pregnancy times)

  pregnancy times is a foreign key for Babies

  parent id is a foreign key for Pregnancies

13. consists of (<u>parent id</u>, hcardid)

  parent id is a foreign key referring to Parents

  hcardid is a foreign key referring to Mothers

14. consists of (<u>parent id</u>, father id)

  parent id is a foreign key referring to Parents

  father id is a foreign key referring to Fathers

15. discusses (hcardid, <u>appointment id</u>, 1st expected due date, final expected due date)

  hcardid is a foreign key referring to Mothers

  appointment id is a foreign key referring to Appointments

16. takes (hcardid, <u>test id</u>, 2nd expected due date)

        hcardid is a foreign key referring to Mothers

        test id is a foreign key referring to Medical Tests