Introduction to Laboratory Informatics: Life of a Specimen

Data Relationship in the Laboratory

Throughout the life of a specimen the amount of data associated with a specimen increases, creating various relationships made up of different types of data. Patient data is our first type of data.
The doctor hospital or laboratory first collects the patient's information. This includes their personally identifiable information or PII, contact information, and any medical history. The patient is given a unique patient identifier which helps protect their PII while still linking their identity to the specimen.

Once all the needed patient information is collected the specimen is collected. When the specimen is collected important data about the specimen and its collection must also be captured.

Those data are collected and stored in the LIMS. Specimen data is our second type of data, it has important implications for data relationships. Next the laboratory that is testing the specimen may be required to split it into multiple aliquots. Note that although this is not always the case, splitting a specimen into multiple aliquots is common for certain laboratory tests.

After specimens are split aliquot information is recorded in the LIMS, creating even more data elements and data relationships related to the specimen.
During and after specimens or aliquots are tested testing data and results are produced and added to the data set.

Logical observations names and codes or LOINC codes are important in this step as they are the standards used for denoting the laboratory testing performed while systematized nomenclature of medicine, clinical terms or SNOMED CT is the standard for coding test results. These standards will be explained in more detail later in the course.

Testing and results data are now part of our data set and are recorded into the LIMS. Finally reports are ready to be generated in, recorded in, and shared from the LIMS adding more data associated with a given specimen or aliquot. Preliminary final amended, and other types of reports may be created during this step and sent to other databases. Data can then be sent back to the electronic medical record or EMR or electronic health record or EHR so that the patient's medical history is up to date and flows back to the original health provider so that the provider can diagnose and treat the patient.

Missing or incorrect information at any point in the process will affect the result which is why it is crucial to have quality data throughout this entire process. In addition the data

relationships that are created as the data grows are important.

Changes in the relationships between these data elements can produce drastic changes in the analysis of data. Each piece of the data and its relationship to the other data plays a role in helping stakeholders in regards to follow-up testing, patient treatment, surveillance, public health research, and for many other purposes.

Link to video job aid [Introduction to Laboratory Informatics: Life of a Specimen – Data Relationship in the Laboratory | OneLab REACH (cdc.gov)]