NAHLN: A Standards-based Approach for Laboratory Diagnostic Data

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The National Animal Health Laboratory Network (NAHLN) information technology system is an evolving application that promises to be a cornerstone of animal health surveillance that will electronically connect surveillance data systems to laboratory diagnostics systems. The most compelling feature of the NAHLN is that it is a standards-based solution for electronic messaging and coding laboratory diagnostic data for both test orders and results.

The value that a standards-based solution provides is a common language for all participants. This means that participants can translate data from their system to a well defined and agreed upon message structure to transfer and share data. This is important to Veterinary Services and other animal health entities because, in many cases, diagnostic data are missing from surveillance systems due to the traditional requirement of duplicate data entry-- once at the lab and again at the area or state offices. The NAHLN increases the potential that vital diagnostic data will be included in surveillance data sets. The standards that the NAHLN uses are Health Level Seven (HL7); Logical Observations, Identifiers, Names and Codes (LOINC); and Systemized Nomenclature of Medicine (SNOMED). These three programs create the foundation for sound data standards for animal disease management systems.

HL7 reaches far beyond the needs of laboratory data exchange for veterinary medicine. It is one of several American National Standards Institute (ANSI) accredited Standard Developing Organizations operating in healthcare (www.hl7.org). Part of the mission of HL7 is to provide standards, guidelines, methodologies, and related services for interoperability between healthcare information systems. The NAHLN utilizes segments of HL7 related to the creation of messages for laboratory orders and observations. The segments are highly organized message structures that define data standards and rules for data exchange. Items such as security, identification and system negotiations can also be formulated into the messaging standard, allowing systems to become more interoperable.

LOINC provides a set of codes that resolves idiosyncratic values in coding. LOINC is a formulation of coding standards for laboratory and clinical observations. Including approximately 32,000 observation terms, each record in the LOINC database identifies a clinical observation containing a 6-part name, a unique name for tests identifying code with check digit, synonyms, and other useful information (www.loinc.org). In addition, there are LOINC records that apply to all tests with equivalent clinical results. LOINC has been endorsed by many large industry, commercial and government entities. There are comprehensive coding standards for clinical observations in the following subjects:

- Surgical Pathology
- Immunology/Serology
- Toxicology
- Microbiology
- Molecular Genetics

SNOMED is a second important set of codes used by the NAHLN. SNOMED provides a scientifically validated clinical reference terminology that offers a common language to enable consistent methods of capturing, sharing and aggregating human and animal health data across many medical specialties. The terminology and coding contained in SNOMED includes over 357,000 health care concepts with unique meanings and formal logic-based definitions which are organized into hierarchies (www.snomed.at) with a fully populated table containing over 957,000 unique descriptions for each concept.

A standards-based solution for the communication of diagnostic data provides the necessary common language for electronic sharing of laboratory orders and observations. The NAHLN affords opportunities for system interoperability, increased data quality and comparability. The NAHLN is certain to be instrumental in helping to build an integrated approach for laboratory diagnostic and surveillance related applications.