Office of the National Coordinator (ONC) Requested Testimony for Health Information Technology (HIT) Policy Committee's (HITPC) and HIT Standards Committee, Washington, D.C., June 7, 2012

The Veterans Health Administration (VHA) Office of Informatics and Analytics (OIA), Health Informatics (HI) division was requested to a provide 5 minute formal oral testimony on the questions below:

- How can the measure development process be improved?
- How can measures better leverage Electronic Health Records (EHRs) capabilities?
- How can the measurement infrastructure and data be leveraged for other types of improvement?

Testimony from Keith Campbell:
Ladies and gentlemen and members of the Committee, thank you for the opportunity to speak with you today regarding the issues of measure development. In my testimony, I will discuss how to enhance and leverage measures in a clinical context in ways that improve the patient's experience of care, and the health of populations and may also lead to a reduction in per capita costs of health care that the Department of Veterans Affairs (VA), VHA strongly believes that improving the U.S. health care system requires simultaneous pursuit of these three aims.

In our experience, it is clear that in order to achieve these goals, measure development can and must be improved. Measurement infrastructure and data capture that is coordinated with clinical decision support and predictive analytics within the HIT system will help to ensure a comprehensive approach to such improvement. This should lead to the highest quality of health care, both as a delivery system as well as with patient outcomes

VA views the measurement development process as one that must first identify the desired data elements which are encoded for a particular measure, and then isolate the sources for that data within the EHR. The current process requires advance knowledge of what desired data element should be included in the HIT system, which results in decreased measure flexibility with regards in new data sets.

Historically, the data element identification process has been significantly hampered by a lack of encoding standardization across health care delivery sites, health care delivery organizations, and health care information systems. As a result, implementers struggle with multiple encoding and messaging systems, overlapping semantics, inconsistent data representations and uncoordinated content and release cycles. Furthermore, the data elements typically used include billing diagnoses, labs and medications. Fine-grained clinical observations from the point of care are largely unavailable for measurement and

improvement activities. VA believes that measures can better leverage capabilities through extending standards and making them easy to implement.

VHA, Office of Informatics and Analytics (OIA) currently has a pilot project which focuses on the collection of fine-grained, encoded clinical data from the point of care, such as symptoms presented at an outpatient visit, and uses that data for real-time clinical decision support, as well as for secondary uses including performance measurement for all aspects of clinical care. The project takes advantage of EHR capabilities including discrete data fields and the ability to monitor that clinical data over time through the EHR.

With the challenges of scale and complexity in mind, OIA is focusing on how best to harmonize legacy and future health information systems, while also simplifying the overall system architecture so that problems of scale are more approachable. Our current activities seek to address these challenges through the development of a Simple Integrated Model (SIM) for representing encoded data and on Lightweight Expressions of Granular Objects (LEGO) to transform the data collected at the point of care as well as legacy data into SIM representations.

The SIM uses the Systematized Nomenclature of Medicine (SNOMED) Terminology Model as its foundation, including EL++ description logic that SNOMED uses. Other terminologies, such as LOINC, NDF-RT and RX-NORM, are integrated into the SIM by transforming them into EL++ representations and handling them as SNOMED extensions.

The EL++ representations, together with the SNOMED Modelers Style Guide, provide a foundation for post coordination of terminology content. Post coordination is an important capability that helps maximize coded content coverage. In addition, the use of an EL++ classifier enables us to represent these post coordinated expressions as single codes (which simplifies the scalable storage of these expressions in relational databases) while still allowing for class-based retrieval and reporting of the encoded data (e.g. return all patients that presented to urgent care and had an acute pulmonary diagnosis).

We use a simple representation for the LEGOs that are able to transform legacy form-based input into these EL++ expressions. These LEGOs, which are small xml structures that allow SNOMED expressions to be carried along with a little bit of context, consist of the following fields:

> **Discernible**: A discernable is something that is perceptible by the senses or intellect. Negation within a discernable is not allowed and conditions support the negation of an entire discernable. A discernable is represented as an encoded SNOMED expression, represented by a single code after classification.

Timing: Timing is a representation of the asserter's belief in the timing during which this assertion is valid. Timing can be represented as a point, a bound or an interval.

Qualifier: A qualifier serves to qualify a value. For example, a qualifier of "unknown, not asked" applied to a value of "null" makes the meaning of "null" more specific. This qualification allows representation of the HL7 null flavors, in addition to allowing a means to qualify substantive values with qualifiers such as "default," "patient entered" and "confirmed default."

Value: The value of a condition can be of several types. The first is numeric, which represents a point, bound or interval. An example of a numeric value is a patient's pulse. Values may also be represented as an encoded expression or a Boolean, such as true or false. However, values must not be used to represent modifiers such as "severe" or "green," which would instead be a part of the *Discernable* expression.

Below is an example LEGO we used to represent the encoding from a legacy form item:

```
<assertion>
        <assertionUuid>black text724  </assertionUuid>
        <pncs  name="HISTORY_CARDIO_Non_Anginal_Chest_Pain_Exertion"
                id= "24220"/>
        <discernable>
           <concept  sctid= "274668005"  desc= "Non-cardiac chest pain">
              <rel  sctid= "47429007"  type= "Associated with">
                 <concept  sctid= "309604004"  desc= "During exercise"/>
              </rel>
           </concept>
        </discernable>
        <qualifier>
           <concept  sctid= "108217004"
                     desc= "Interview, history AND/OR physical examination"/>
        </qualifier>
        <value>
           <concept  sctid="52101004"  desc= "Present"/>
        </value>
 </assertion>
```

To date, we have built approximately 1,500 LEGOs to support data capture and reuse for pressure ulcers and venous thromboembolism. Currently, we are constructing the back end data systems to store and query these granular observations. We have found that this approach is more flexible than historic "mapping" approaches. We are aware of, and are participating in, evaluating similar efforts to blend information and terminology modeling. We hope to contribute to any shared efforts that emerge in the future.

Thank you for your interest. I am happy to answer any questions now or as part of the panel as the Chair directs.