

# What does it take to implement VISTA outside of the US?

By Sam Habiel, Pharm.D. Technical Fellow OSEHRA

#### **Outline**

- 1. Character Sets & Bidi
- 2. Date and Number Formatting
- 3. Terminologies and Lexicon
- 4. Printing Patient Information
- 5. Medicine Practice/US Law
- 6. Demographics



### **Character Sets**

- VistA as-is runs as ASCII
  - (with very limited ISO-8859-1 encoding for Spanish)
- A couple of international implementations use single byte encodings
- Multibyte encoded languages need to use UTF-8.



#### VistA and UTF-8

- There are some minor issues with Fileman
  - }}} or ~ to end loops
  - z to jump to the end of lookups
  - Printing columnar output with multi-byte encodings.
- Major issues with Delphi Clients (including CPRS)
  - My latest test on 30c showed that it's still single byte encoding.
- XWB Broker is not UTF-8 safe.



## VistA and UTF-8 (cont)

- Some VistA code uppercases by subtracting 32 from a code point value
- Terminal shortcuts assume Roman Letters keyboard
- GT.M/YottaDB has better UTF-8 support than Cache
- EHS's UTF-8 Experiment (2009):
  - http://smh101.blogspot.com/2011/04/unicodesupport-for-vista-jordan.html



## VistA and UTF-8 (not!)

### Single-Byte encodings

- Windows-1256 (Arabic), TIS-620 (Thai)
- Solve the Delphi Issue, solve XWB broker issues

#### • But

- M implementation can get confused if it doesn't understand the locale correctly in pattern machings (e.g. Patient Names)
- Printers don't support these encodings



#### VistA and Bidi

- Bi-directional text
- Issue for Arabic, Hebrew, Urdu, and Persian.
- Mostly works as it is handled by the infrastructure, except:
  - Fileman columnar reports
  - SSN formats in CPRS



## **Date Formatting**

- http://en.wikipedia.org/wiki/Calendar\_date
  - Little Endian 30/11/2011- Most common
  - Middle Endian 11/30/2011- US Format
  - Big Endian 2011-11-30 Some countries
- VistA: Middle Endian in some places, alpha-date in most.
- M APIs can be made internationalized, but a lot of VistA doesn't use Date APIs
  - TIU
  - Scheduling



## Date Formatting, cont.

- CPRS, BCMA will present challenges with dates
  - If you change your Windows Locale, the following will stop working in CPRS:
    - Cumulative Labs
    - Vitals Graphing in Reports
- CPRS expects dates from VistA to be valid numbers. 3101130.123031 would not parse in German and Nordic Locales.



## **Number Formatting**

 If you use a comma to delimit decimals, you will have many problems in VistA code.



## Terminologies and Lexicon

- International installations are very unwilling to invest in terminologies while they experiment
- Terms that ship with VISTA are US based (e.g. ICD-10-CM-US)
- ICD-10 is free to use
- SNOMED-CT needs a license from IHSTDO.
- CPT is proprietary, but is baked into VistA.



## Terminologies and Lexicon

- No auto correct for mis-spellings
  - And non-English speakers are already bad at spelling.
- Medical Conditions may have different local abbreviations



## **Printing Patient Info**

- Zebras support UTF-8.
- HP Printers—not by default.
- Pharmacy Labels
  - Spanish Framework was used in Jordan
  - Worked for Arabic
  - Did not work for Thai
  - Used sed script to translate a PCL document to a Zebra document



# Differences in practice of Medicine

### Different Drugs

Don't underestimate Japanese Drugs!

#### Labs

- Labs are the same
- But panels are different

#### Growth Charts

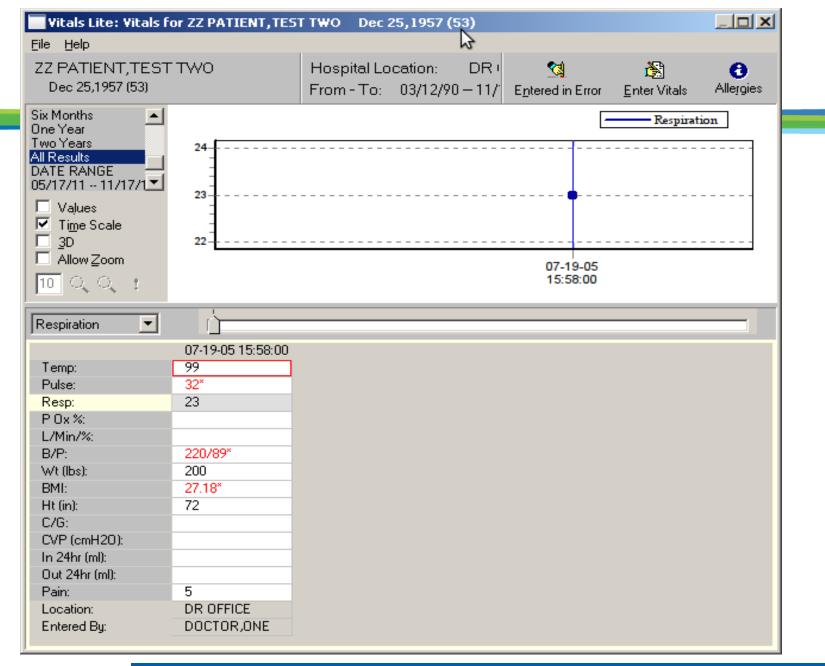
- Most of world uses WHO Standard, not NHANES
- Pencentiles vs Z Scores



# Differences in practice of Medicine

- Vitals
  - Metric vs English
- Abbreviations
  - OD vs QD







### **US Law baked into VistA**

- SSNs
- DEA Rules



## Demographics

- Your country may not have postal codes
- Different Rules than VA Rules
  - Jordan: A wife must have her husband's contact info
  - Not vv
- Names look very different and are searched differently
- 35 characters are not enough



#### Conclusion

- In spite of all of this, the most important factor is clinical leadership and good implementation.
- If you want VistA for your entire country, be prepared to spend some time seeing what works for you.

