



Project MergEHR

Sharing Code Between Primate Centers

F. Daniel Nicolalde, PhD

Informatics and Data Service - Unit Head

Wisconsin National Primate Research Center

National Primate Research Centers

- Seven institutions across the US
 - *California, Oregon, Southwest, Tulane, Yerkes, Washington, Wisconsin*
- Founded by the National Institutes of Health
- Established more 50 years ago
- Established as a resource for research for each corresponding regions



Wisconsin National Primate Research Center

- Host institution University of Wisconsin - Madison
- Located in three different locations
 - Main buildings - near University campus
 - Secondary building - at the Medical School
 - Quarantine building - located 20 miles away
- Housed close to 2000 non-human primates
 - Two breeding colonies (Rhesus and Marmosets)
- 2009 ARRA funding to develop Primate Health Record system
- Together with LabKey developed couple of modules

Evolution of Primate Health Record System

- Modern health record system to store information of NHP
- System went live at Wisconsin around 2011
- Around 2012 Oregon started development of their own version
 - Both centers share a common based module (i.e. EHR)
- Three other centers have or are in the process of developing their own versions of EHR modules
 - Southwest (2014), California, and Tulane
- Since 2015 we have meet regularly with all Primate Centers
 - Meeting every other month remotely
 - Yearly in-person meeting during LabKey Users conference

Code Sharing between Centers

- Two main methods:
 1. LabKey development
 - **Center specific EHR modules**
 - **Billing module**
 - Marmoset R24 grant
 2. Center development
 - **PrimateID - Wisconsin**
 - **Breeding Cohort builder - Southwest**
 - Necropsy request and scheduling - Wisconsin



Center Specific EHR Modules - LabKey

- Each center shares a common EHR module
- Each center has extended this common module to match their specific needs
- Code mainly resides in LabKey's SVN repository
- Common module is stable between LabKey core versions
 - Changes are recommended by each center and vetted by LabKey staff
- Center specific modules are improving constantly
 - Some features can be exported and adopted by each center

Billing Module - LabKey

- Helps primate center manage accounts and generate invoices
- Initially developed by ONPRC
- Wisconsin is generalizing module and modifying for our use
- Maintained in LabKey's SVN repository
- Wisconsin is planning to go live early next year
- Expanding Oregon's Billing module saved development time
- Other centers are planning to adopt this module in the near future

PrimateID - Wisconsin

- Uniquely identifies each non-human primate across all centers
- Standalone module developed to work with LabKey or other systems
- Code maintained in GitHub by Wisconsin (<https://github.com/WNPRC-EHR-Services/primate-id.git>)
- Wisconsin is planning to deploy before the end of year
- Does not replace center specific identification
- 10 characters long:
 - 2 digit, center-defined **prefix** (e.g., “WI”)
 - 7 random Base32-encoded characters (drops 'I', 'J', 'O', and 'S')
 - 1 **check character** to validate the others
 - For example: **WI FFQGDT6 H**

Breeding Cohort Builder - Oregon/Southwest

- Using primate demographic information establishes animal groups for breeding purpose
- Develop as a R studio application
- Developed between Oregon and Southwest Primate Centers
- Started to be used by Wisconsin under a request from Veterinarian staff
- Code maintained in GitHub (<https://github.com/rmsharp/nprcmanager.git>)

Running a Production Server

- Wisconsin and other Primate centers depend on LabKey to perform their daily work
- All animal treatments, observations, and health information are enter directly into the LabKey daily
- LabKey updates platform every four months
 - Wisconsin and Oregon running version 17.2
 - Other centers in active development are running trunk
- Determine how far behind your production system can be
- Update schedule changing based on technology stack (i.e. Java)



Wisconsin National
Primate Research Center
UNIVERSITY OF WISCONSIN-MADISON

Questions

fdnicolalde@primate.wisc.edu