ENHANCING RESEARCH ON A CLINICAL DECISION SUPPORT AND GEOGRAPHIC INFORMATION SYSTEM: GETTING INVOLVED AS INFORMATIONISTS

Elizabeth (Beth) Whipple
Rick Ralston
Jere Odell
Carly Zimmerman
Gil Liu

October 6, 2013

This presentation is supported through the National Institutes of Health, grant R01 LM-010923, "Delivering Geospatial Intelligence to Health Care Professionals"
NLM Administrative Supplement for Informationists

• First ever supplement of its kind
• Awarded to support current grants at one’s institution
• Highlighting the value of informationists being included on research teams
• Announced in fall 2012—8 projects
Objectives

• Choosing our project
• Overview of our parent grant (s)
• Our role and aims
• Lessons learned, informationist value, challenges
Choosing our Project
<table>
<thead>
<tr>
<th>A</th>
<th>BADAERGIC MECHANISMS IN THE MODULATION OF BINGE-LIKE ETHANOL INTAKE IN MICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>SMALL MOLECULE INHIBITORS OF ONCOSCENIC HUMAN PAPILLOMAVIRUS</td>
</tr>
<tr>
<td>5</td>
<td>NUTRITIONAL REGULATION OF HNRNP-E1 AND RELATED GENES</td>
</tr>
<tr>
<td>6</td>
<td>ASTROCYTE DEVELOPMENT AND REACTIVE GLIOSIS</td>
</tr>
<tr>
<td>7</td>
<td>DEVELOPMENT OF ATTENTION TO MATERNAL SPEECH IN INFANTS WITH HEARING LOSS</td>
</tr>
<tr>
<td>8</td>
<td>GABAERGIC MECHANISMS IN THE MODULATION OF BINGE-LIKE ETHANOL INTAKE IN MICE</td>
</tr>
<tr>
<td>9</td>
<td>PHARMACOLOGICAL MANAGEMENT OF DELIRIUM</td>
</tr>
<tr>
<td>10</td>
<td>TRANSLATION RESEARCH ON CHRONIC DISEASE SELF-MANAGEMENT</td>
</tr>
<tr>
<td>11</td>
<td>MODELING ALZHEIMER DISEASE COSTS AND TRANSITIONS</td>
</tr>
<tr>
<td>12</td>
<td>ALZHEIMER'S DISEASE MULTIPLE INTERVENTION TRIAL - ADMIT</td>
</tr>
<tr>
<td>13</td>
<td>BREATH INTERVENTION FOR HOT FLASHES; INTERFERENCE; AND ASSOCIATED OUTCOMES</td>
</tr>
<tr>
<td>14</td>
<td>COMPUTER DECISION AIDS FOR ADHD MANAGEMENT (CDAAD)</td>
</tr>
<tr>
<td>15</td>
<td>INCREASING COLORECTAL AND BREAST CANCER SCREENING IN WOMEN</td>
</tr>
<tr>
<td>16</td>
<td>ROLE OF SHP2 IN FLT3-ITD-INDUCED LEUKEMOGENESIS</td>
</tr>
<tr>
<td>17</td>
<td>EVALUATION OF CANINE RETRACTION STRATEGIES</td>
</tr>
<tr>
<td>18</td>
<td>DNA-LESION BYPASS POLYMERASES AND THERAPEUTIC COMPOUNDS</td>
</tr>
<tr>
<td>19</td>
<td>NEUROFIBROMATOSIS TYPE 1: A GENETIC REGULATES MYELOPOIESIS</td>
</tr>
<tr>
<td>20</td>
<td>FANCONI ANEMIA STEM CELLS ALLOW MOLECULAR CHARACTERIZATION OF ACUTE LEUKEMIA</td>
</tr>
<tr>
<td>21</td>
<td>GENETIC THERAPY FOR FANCONI ANEMIA</td>
</tr>
<tr>
<td>22</td>
<td>NEUROBEHAVIORAL ASSESSMENT OF ETHANOL SEEKING AND INTAKE IN THE RAT</td>
</tr>
<tr>
<td>23</td>
<td>IDENTIFICATION OF GENES THAT AFFECT PEAK BMI IN MEN AND WOMEN</td>
</tr>
<tr>
<td>24</td>
<td>WHOLE-BODY PET/CT ASSESSMENT OF TUMOR PERFUSION USING GENERATOR-PRODUCED 62CU</td>
</tr>
<tr>
<td>25</td>
<td>ROLES OF STAT PROTEINS IN TUMOR VACCINE DEVELOPMENT</td>
</tr>
<tr>
<td>26</td>
<td>SELENIUM OTHER RISK FACTORS AND COGNITIVE DECLINE IN RURAL ELDERLY CHINESE</td>
</tr>
<tr>
<td>27</td>
<td>MECHANISM OF REDOX REGULATION BY APELI/REF1</td>
</tr>
<tr>
<td>28</td>
<td>INDIANA ALZHEIMER DISEASE CENTER</td>
</tr>
<tr>
<td>29</td>
<td>TGF-beta1 IN THE BONE MICROENVIRONMENT: ROLE IN TUMOR METASTASIS</td>
</tr>
<tr>
<td>30</td>
<td>PALLIATIVE CANCER CARE: MUSIC VIDEO FOR AYA-PARENT COMMUNICATION AND RESILIENCE</td>
</tr>
<tr>
<td>31</td>
<td>INDIANAPOLIS-BADAN DEMENTIA PROJECT</td>
</tr>
<tr>
<td>32</td>
<td>ACTIVATION AND INHIBITION OF ALDEHYDE DEHYDROGENASE 2</td>
</tr>
<tr>
<td>33</td>
<td>ROLE OF HYPOXIA-INDUCED MIR-210 IN TUMOR METABOLISM</td>
</tr>
<tr>
<td>34</td>
<td>REPRODUCTIVE ADENOVIRUS AND ANTI-ANGIOGENIC THERAPY</td>
</tr>
<tr>
<td>35</td>
<td>DOPAMINERGIC FUNCTION IN ALCOHOLISM</td>
</tr>
<tr>
<td>36</td>
<td>THE ROLE OF APELI IN NEUROTOXICITY OF CANCER TREATMENTS</td>
</tr>
<tr>
<td>37</td>
<td>CLINICAL KNOWLEDGE HUB - CONCEPTUAL INTEGRATION OF RULES; DATA SET; AND QUERIES</td>
</tr>
<tr>
<td>38</td>
<td>REGULATION OF APP PATHWAY GENES PROMOTORS IN ALZHEIMER'S</td>
</tr>
<tr>
<td>39</td>
<td>REGULATION OF APP PATHWAY GENES PROMOTORS IN ALZHEIMER'S</td>
</tr>
<tr>
<td>40</td>
<td>CHOLINERESTERASE INHIBITORS IN ALZHEIMER'S</td>
</tr>
<tr>
<td>41</td>
<td>NON-HOMOLOGOUS END JOINING REPAIR IN HUMANS</td>
</tr>
<tr>
<td>42</td>
<td>DELIVERING DATA SPATIAL INTELLIGENCE TO HEALTH CARE PROFESSIONALS</td>
</tr>
<tr>
<td>43</td>
<td>THE ROLE OF RIBOSOMAL PROTEINS IN THE P53-MDM2 PATHWAY</td>
</tr>
<tr>
<td>44</td>
<td>INTERPLAY BETWEEN 14-3-3GAMMA AND MDM2 IN REGULATING THE P53 PATHWAY</td>
</tr>
</tbody>
</table>
Choosing our Project

• Who wrote what?
  • We wrote the admin supplement
  • With other awardees, PI wrote the supplement

• How did other awardees choose their projects?
  • Some emailed ALL eligible grant PIs (marketing opportunity)
  • Some emailed targeted grant PIs
Our Project

- CHICA-GIS
  - Child Health Improvement through Computer Automation (CHICA)
  - Geographic Information System (GIS)

"Delivering Geospatial Intelligence to Health Care Professionals"
Overview of our parent grant (s)
What is CHICA?

• CHICA—Child Health Improvement through Computer Automation
• A pediatric computer-based decision support system (CDSS)
• Used in 4 pediatric clinics in central Indiana
• Connected with Regenstrief Medical Record System
What makes up CHICA?

- Prescreener Form (PSF)—printed off, filled out by parent or child for check-in at clinic, health care worker
  - 20 yes/no questions
- PSF scanned, OCRed, fed into CHICA
- Physician Worksheet (PWS)—printed off, filled out by physician
  - 6 targeted physician preventive care reminders
- Just-in-Time (JIT) handout for patients
Data gathered from pre-screening form – parent section
Dental Referral: “Has (child name) been to the dentist in the past year?”
(Target Population: Children older than 1 year of age;)
Tutoring Referral: “Do you think (child name) is struggling in school and needs tutoring help?”
(Target Population: Children older than 7 years of age)
Data gathered from pre-screening form – clinic staff section
Physical Activity Referral: Patient Height and Weight
(Target Population: Children older than 5 years of age)

2 Positive response(s) in Box 1

3 Additional data gathered from EMR (e.g., patient home address, insurance) inputted into CHICA

4 CHICA Provider Worksheet
*Behavioral counseling
Just-In-Time (JIT) Handout
*Referral options

5 Selection on JIT of Referral Resource by parent/patient in consultation with physician

6 JIT scanned into CHICA

7 Referral form automatically faxed by CHICA to selected resource including a Follow-up Form

8 Follow-up Form Faxed Back?
No

9 Follow-up question printed on pre-screener at next appt

10 Just-In-Time Patient Handout
*Resource Specific Information
*Map Document

Yes

Exit Algorithm: Repeat surveillance in appropriate timeframe

Exit Algorithm: Repeat surveillance in appropriate timeframe
What is CHICA-GIS?

• Creating Just-in-Time handouts (JITs), specifically tailored to exercise, dental clinics, & academic support (tutoring)
• GIS component of the JIT, working with a local GIS partner (Polis Center)
# Just In Time handout - Exercise

## Physical Activity Resource

Imagine something that would make you live longer, feel stronger, and be healthier — physical activity is that one thing.

### FOR PARENTS & PATIENTS
- Get 60 minutes every day of moderate physical activity
- Limit screen time to less than 2 hours per day
- Remove TV/computer from bedroom
- Limit sugary beverages
- Eat 5 servings of fruits and vegetables every day
- Eat breakfast daily
- Encourage family meals
- Decrease the number of times you eat out at restaurants

### FOR PHYSICIANS
- Assess daily activity patterns
  - USE MAP AND CONTACTS ON BACK OF THIS PAGE TO CONNECT FAMILY WITH A COMMUNITY RESOURCE FOR PHYSICAL ACTIVITY
- Assess dietary behavior
  - Snacking habits
  - Emotional eating
- Assess attitudes
  - Perception of body weight & body image
  - How does parent feel about child’s weight?

### FOR PHYSICIANS
- Readiness / barriers to change
  - On a scale of 1 to 10, how ready are you to start making changes in how you eat or how you exercise?
- Laboratory workup
- Risk factors or unknown family history:
  - Measure BP, and consider lipid panel
  - In those ≥ 10, consider glucose & LIP’s

---

**Doctor:** Dr. Provider  
**Clinic:** Peck Health Center  
**Clinic Contact Info:** (317) 266-2921

---

### Other resources:
- [Fit City](http://www.fitcity.org)
- [INSlope Indiana University](http://www.indiana.edu/)

---

## Exercise Programs

<table>
<thead>
<tr>
<th>1</th>
<th>Zumba at the Walker</th>
</tr>
</thead>
</table>
| **Street:** 917 Indiana Ave  
**Zip:** 46202  
**Phone:** (317) 236-2099  
**Times:** Mon 6:30pm-7:30pm  
**Ages:** 18+ |
| Costs: $8 for a class or sign up for 5 weeks for $40; no |

### IU Track and Soccer

<table>
<thead>
<tr>
<th>4</th>
<th>IU Track and Soccer</th>
</tr>
</thead>
</table>
| **Street:** 1001 W New York St  
**Zip:** 46202  
**Phone:** (317) 274-3740  
**Times:** Mon-Fri 4pm-6:15pm, Sat 7:45am-1:30pm, Sun 10am-2pm |
| Ages: any  
**Costs:** $22 per month for track and soccer stadium |

### Indy Parks - Fall Creek and 16th Park

<table>
<thead>
<tr>
<th>2</th>
<th>Indy Parks - Fall Creek and 16th Park</th>
</tr>
</thead>
</table>
| **Street:** W 16th St & Fall Creek Pwy E Dr  
**Zip:** 46202  
**Phone:** (317) 927-7008  
**Times:** dawn to dusk  
**Ages:** any  |

### 5 | Arthritis Foundation |
|---|---------------------|
| **Street:** 515 N Alabama, Ste 430  
**Zip:** 46202  
**Phone:** (317) 879-0321  
**Times:** varies by program, call for times  
**Ages:** 18+  
**Costs:** varies by program, call for pricing |

### IU Natatorium

<table>
<thead>
<tr>
<th>3</th>
<th>IU Natatorium</th>
</tr>
</thead>
</table>
| **Street:** 801 W New York St  
**Zip:** 46202  
**Phone:** (317) 274-3740  
**Times:** Mon-Thu 5:30am-8:00pm, Fri 5:30am-7:00pm  
**Ages:** any |
| Costs: $8 per visit. One month membership $42.00 |

### 6 | Invoke Yoga - Downtown |
|---|------------------------|
| **Street:** 970 W Park Way Ave, Ste C  
**Zip:** 46202  
**Phone:** (317) 671-9994  
**Times:** Mon-Thu 5:00pm-8:00pm  
**Ages:** 18+  
**Costs:** Community classes start at $8 monthly and... |
Why CHICA-GIS?

• Places patients can visit to improve their health: dental, physical, & academic
• More patients will get the help/support they need, in their communities
• Helps physicians do an informed job of referring patients to services in their neighborhoods
What is our role in this project?
Role of informationists in CHICA-GIS (proposed)

• Monitor accuracy & literacy level of referral data & automatically generated documents
• Develop a knowledge management plan for CHICA-GIS
• Participate in community health information outreach services
• Dissemination
Role of informationists in CHICA-GIS Projects

• Accuracy of information
  – Tutoring resources
    • Current database very scant
    • No single good resource for central Indiana
    • Phoning all IMCPL branches
    • Google searches, follow up phone calls
    • Continue to add to database

• Doubled amount of tutoring resources available in database
Role of informationists in CHICA-GIS Project

- **Accuracy of information**
  - JITs
  - Usability/overall design
  - Shortened URLs/space allocation
  - Consistency across all three types (exercise, dental, tutoring)

- **Phone Survey**
  - Input on rating system for referral locations
  - Additional questions to survey tool

DELIVERING GEOSPATIAL INTELLIGENCE TO HEALTHCARE PROFESSIONALS
TELEPHONE INTERVIEW SCRIPT

Hola, me llamo _________. Estoy llamando de la oficina de _______. ¿Usted es su mama/papa o guardiana?

¿Hace dos semanas, su niño/a fue cuidado/a en la clinica ________ por ________?

Quisieramos saber si su doctor recomendó algo para ayudar con ________. La prevención de caries dentales o mejorar las notas en escuela.

Estamos invitando a 2,226 padres a participar en una entrevista telefónica de 10 minutos. Si decide Ud. participar, las respuestas que Ud. comparte nos ayudarán a entender más sobre como mejorar los consejos dadas por los doctores.

Por favor sepa Ud. que su nombre, el nombre de su niño/a y lo que hablamos se mantendrá privado. No vamos a compartir sus respuestas con nadie fuera del equipo del estudio incluso ni a la doctor de su hijo/a.

Me gustaría recordarle Ud. que esta entrevista es voluntaria y confidencial.

Aunque es posible que algunas partes de esta entrevista habría grabada le aseguro que yo estoy haciendo las preguntas de una forma estándar, toda la información que me da Ud. permanecerá confidencial y se usará únicamente con el propósito de investigación.
Role of informationists in CHICA-GIS

• Knowledge Management
  • One of the most exciting aspects of the project
  • Initial thought:
    • capturing tacit knowledge of CHICA-GIS processes, associated documents
  • Evolved into management of the knowledge that exists to make the CHICA system work
  • Practical implications
Role of informationists in CHICA-GIS

• Knowledge Management Plan
  • Knowledge map for CHICA-GIS system
  • Set of rules that govern decision support (Arden rules)
  • Rules added as needed
  • Currently no comprehensive map/catalog showing connections between rules
    • Ex. No current connection between parents smoking and child’s asthma in the CHICA rules
  • Mapping current rules for building future rules
  • Discovering new relationships in the CHICA system
Mapping the rules: conceptual and logical relationships in a system for pediatric clinical decision support AKA come see our poster!
Physician Preventive Care Reminders

Jenny had an inconclusive sickle cell screen on 12/21/2004. It's recommended that children with Hgb A+S+F be rechecked after they reach 6 months of age:

- [ ] Child needs retesting ->
- [ ] Ordered screen & path confirm
- [ ] Child has been rescreened ->
- [ ] Sickle Cell POSITIVE
- [ ] Sickle Cell NEGATIVE or Trait

Assessments and Plan:

9 mo ≥ TB risk factor? -> will rescreen
Hgb A+S+F .. will rescreen. Needs Pediprix #3

Medication Education Performed: Y N N/A

Staff: [Signature]

Physician: Paul Biondi
Apt. Date: Sep 26 2005
Apt. Time: 7:30PM
Role of informationists in CHICA-GIS

• Community Health Information Outreach Services
  • Develop a communication plan to share basics of CHICA-GIS with referral locations
  • Providing health information resources at referral locations
  • Identify barriers to the adoption of CHICA-GIS in the community
Lessons learned
Informationist value
Challenges
What we’ve learned so far

• PIs are nice
  • Also excited that you want to work on their project
• Good discussions can be had in informal settings (as well as in conference rooms)
• This is a real cool project!
• Timelines are good for everyone
Value (we see) functioning as informationists

- Adding value/enrich quality
  - Increasing tutoring locations in the database

- Providing a different perspective
  - New to the project, view documents from end user/usability perspective

- Long-term enhancement to the CHICA-GIS system
  - Broader implications to improve a clinical decision support system
Challenges/Obstacles

- Staying on track
- Evaluation
  - How do we know this is working/helping?
  - How do we know this will “benefit” the library?
- Dividing & conquering responsibilities
- Balancing w/other job requirements
- Communicating our role
Challenges/Obstacles

• PI changed direction of knowledge management

• Arden Rules
  • Having to learn a rule system entirely new to all of us
  • Understanding decision support syntax

• New jobs!
  • PI at different institution
  • Informationist in new job
Interested in applying?

• 2nd round of informationists supplemental awards currently open
• Submissions now open
• Due November 5, 2013
• Earliest start date February 2014

Why apply?

- Raises library profile in institution
- New way to market library skills
- Bringing your researchers more $ may make them happy
- Helping to move libraries forward/help institutions think about libraries differently

(really, we’re still using the same skills we’ve always had, just packaging/presenting them differently)
Many thanks to:

- Carly Zimmerman, SLIS intern
- Gil Liu, CHICA-GIS PI
- Steve Downs, CHICA PI
Questions?

ewhipple@iu.edu
rralston@iu.edu
jdodell@iupui.edu