Dear Whooo,

I am a hospital librarian who is very interested in keeping my library active and relevant to the needs of my hospital. Lately, I have been considering the issue of patient safety; my thoughts were triggered by hospital activities during this year’s Patient Safety Awareness Week, and Barb Jones’ call for feedback from librarians involved in patient safety initiatives. I thought about the work I do with various units and professions within my hospital, and how the overall goal is the safety and good health of our patients. I wonder if there is something I am overlooking, or missing in the patient safety discussion. I do lots of searches for quality improvement, protocols, and individual treatment. Is there more?

Wondering

Dear Wondering,

Thank you so much for writing, Wondering. I am glad to see that you are involved with a variety of units within your hospital and are considering the issue of patient safety as well as addressing specific inquiries.
that involve patient safety problems.

Since you have been observing the priorities of your hospital, you are probably aware of the emphasis on high reliability. Weick and Sutcliffe have written about how high reliability organizations function and stay safe. Their description of a HRO (high-reliability organization) is "an environment of 'collective mindfulness' in which all workers look for, and report, small problems or unsafe conditions before they pose a substantial risk to the organization and when they are easy to fix." This description generally does not describe the conditions found in healthcare. "...in health care, uncoordinated and poorly designed and maintained mechanical systems (like medical device alarms) are tolerated, even though they are not safe. Intimidating behaviors suppress reporting and lead to additional unsafe behaviors as caregivers create workarounds to avoid repetitive exposure to intimidators. Errors are not seen as valuable information, essential to a hospital’s ability to improve patient safety." Thus, I think you will agree that the current emphasis on high reliability is justified, and time spent on high reliability is time well spent.

I think all of us who work in hospitals can point out the validity of these statements. We see issues on nursing units, in the emergency department, in the hierarchy that occurs among the healthcare personnel, and in many other places. The question for us, Wondering, is whether we see any of these issues in the library or in library services provided. Every health sciences librarian I know truly believes that services provided by librarians lead to a higher quality of care. These librarians are conscientious, well-educated, and highly skilled professionals. However, they are all people and are subject to the same errors and lapses in judgment as members of any other profession.

So, the answer to your question is yes, there is more. As conscientious professionals, librarians need to be sure to examine their own practices for small mistakes, workarounds, and potential for error. We need to be unafraid to find and admit our errors, and be willing to use those errors to learn how to perform in a highly reliable way. We need to examine our systems within the context of the larger hospital system to identify where the evidence/information we provide intersects with others, and ensure that intersection is fully functional. This is a continual effort; it cannot be addressed once and then put aside with the conviction that all is well.

All of this is pretty theoretical and abstract. To bring it down to the practical level, here are some examples of areas that librarians should address in the daily practice of their profession.

- **Peer review of searches**: Do you ever have another librarian or information seeker review your search strategy and evaluate its effectiveness? Obviously, this is not practical for every search, and is difficult if you are a solo librarian. Maybe you can find someone in another hospital and ask your colleague to review your strategy for a difficult search or at a predetermined interval. You can offer to reciprocate which will ensure that both of you will benefit.

- **Complete the communication loop**: When you perform a search for a user and deliver the results, do you attempt to close the communication loop and find out if your search was useful, and if so, why? All of the librarians I know have drawers full of compliments from users stating how wonderful the librarian’s service was. Few of those compliments state why the service was so useful. It is impossible to learn and improve without the knowledge of what is expected and what works.

- **Clarity in reference interview**: Once you have received a search request, and you find when searching that you are not really clear about the specific need of the user, are you able to contact that person for clarification? Often complex topics require some dialogue to identify the precise need.

- **Completeness of database selection**: When you are conducting a search, are you open to searching in multiple databases? What about the gray literature? What about in other disciplines? Medicine and healthcare are highly complex fields, and often the required “answer” is found in sources other than traditional medical sources. For instance, information on the reliability of medical equipment may be found in the engineering literature.

These are only a few of the ways librarians need to examine their processes and work to uncover error. For a more complete discussion of this topic, you may want to read the chapter “Analyzing Breakdowns in the EIK Pathway” in the recent text *Patient Safety: Perspectives on Evidence, Information and Knowledge Transfer* edited by Lorri Zipperer in 2014.

Thank you again for your question, Wondering. This is an issue that I care about very deeply, and I think that our profession should consider it seriously. I hope this has been helpful. Please write again if you have further questions.

Sincerely,
Patient Safety: Librarians have nothing to do with that, right?

WRONG!

According to modern wisdom, the patient safety field came into prominence with the Institute of Medicine’s “To Err is Human”\(^1\) report in 2000. This report recognized that harm resulting from medical care was a significant problem, and patient safety moved to the top of the national healthcare reform agenda. Since that time considerable time, skill, and resources have been applied to the problem, however, to date, little recognition has been given to the impact of evidence and information on the issue.

Members of the health sciences library community remember the consequences of an incomplete literature search with the death of Ellen Roche in a clinical trial at Johns Hopkins University in 2001. Even though the patient safety community at large has not tracked adverse events occurring at least partially due to inadequate evidence/information in clinical care, some members of the medical library community have approached the problem and incorporated patient safety concepts into their library practices.\(^2\) The following are three examples of librarians in the MCR that have accepted the challenge of improving patient safety practices and are contributing their skills and expertise in their individual environments.

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From 2003 through 2013, I teamed up with a member of our nursing faculty and the nurse education coordinator to teach a course to our staff nurses on Evidence Based Practice. While the format of the course changed over the years, the basic premise of teaching EB\(P\) using problems and questions that the staff nurses were currently facing remained consistent. We taught the nurses over multiple sessions how to take their questions, fashion them into PICO statements and then use those to search the literature. I guided them through searching in CINAHL, Cochrane, and MEDLINE (to name a few databases) covering the use of search tools such as truncation and Boolean operators. The nurses were also guided in gathering data from their own units on current practice (as compared to the best practice guidelines they found in the literature.)

With the data from their literature searches and their units, the nurses presented their findings to their managers, the physicians and the administrators. The nurses reported back that their projects often adjusted current practices resulting in changes such as reducing hospital-acquired infections or readmissions back to ICU.

A sample of the questions tackled:
- Evaluation of rectal tube use in critical care patients population
- Does the effect of hypothermia improve outcomes in the patient with a traumatic closed head injury?
• Evaluation of the current disinfectant policy for central line placement in the NICU

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We have a pretty steady flow of work from the Quality Consultants in our region of Intermountain Healthcare. While they are not one of the top three groups of patrons we serve each month, we are an important part of their work. The librarians have been involved for a long time with this group of patrons, including Outcome Analysts and others. Often the research starts in my office with a detailed explanation of a sentinel event and what the investigator wishes to learn. The results of our work led to changes in processes and procedures in the hospital to prevent similar events from occurring. When I coordinated with my hospital’s systems improvement director and she notified her team that we were willing to push some information out to them, I added three new names to my distribution list.

I became aware of the librarians’ role in patient safety efforts by taking the Patient Safety seminar for my CHIS Tier II certification. That’s when I realized that a lot of what I do at this hospital falls under the patient safety umbrella. I would like to see the librarians be more closely integrated with the quality team in our region. I have made some contacts with the systems improvement director and hope to have some productive conversations soon. For example, if there is a schedule of open projects and we were privy to that information, we could proactively do literature searches.

A few topics I have worked on so far in 2015 include predictors of unexpected outcomes after urgent care visits; use of tranexamic acid in total knee and/or hip arthroplasty; surgical wound infection protocol for hysterectomy; and how a spine clinic saves money and results in better outcomes.

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Hospitals focus on patient safety with laser intensity and the push for constant improvement in patient safety is anything but subtle. As a librarian serving a hospital I’m not physically implementing new protocols, scrubbing the hub, or practicing safe handoff (although I foam in and foam out like a champ), but I am doing the research support to assess, change, and implement new and better protocols to keep our patients safe.

Being embedded in the hospital and working with clinicians allows me to better support patient safety by being in meetings where events are discussed that I can then find information on. It allows me to create relationships with clinicians so they think to call me when they are tasked with guideline or protocol updates.

Clinical rounding is another area in which I support patient safety. Providing evidence based research to support clinical decision making in a timely manner takes the burden off the physician to look up good relevant research and still puts supportive information in their hands when they can use it for the patient. According to the Journal of Evaluation in Clinical Practice, “One of the main barriers against the implementation of evidence-based medicine (EBM) is the lack of search skills, an element that affects the finding of the best available evidence.” Teaching, offering 1:1 trainings, and following up after rounding with a mini EBP searching session are all ways I close the knowledge gap of question and information.

In a pilot run at St. Louis Children’s Hospital Emergency Unit, with Becker Medical Library and the CMIO, the library integrated point of care decision making resources into the electronic health record to make resources available in the clinical workflow. The idea was to reduce misdiagnosis and support meaningful use therefore supporting patient safety. Being knowledgeable about what resources are most useful at the point of decision making was one way the library supports patient safety. When using the tools the physicians might not be thinking of the library and librarians but we are the ones to select and package information in a meaningful way.
Patient safety is more than a buzzword, it can make or break a hospital’s reputation and librarians who have little to no contact with patients and patient care can be an integral part of supporting best practice in patient care. Librarians have the knowledge and tools to influence patient care and safety practices by providing their skills and expertise to providers on the front line.

If we accept the definition of patient safety from the Committee on Quality of Health Care in America 2001 as promoting action that “avoid(s) injuries to patients from the care that is intended to help them,” these three examples qualify as contributing to that effort. As you can see, the contributions these three librarians have made and are making toward improving patient safety are varied, and suited to their individual job descriptions and the institutions they serve. However, they share common characteristics:

- Willingness to be proactive,
- Awareness of the clinicians’ priorities,
- Willingness to learn more about new initiatives and priorities and increase their skills in those areas,
- The ability to see the larger system’s needs for evidence/information and apply their skills to those needs.

These three cases are among the many librarians in our region whose work contributes to the safe care of patients. Kudos to these three for offering to share what they contribute. We can all learn something from these three to apply to our own practice and the patient safety effort.


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**Data Visualization Tools: From Start to Finish**

How do you like your data presented to you? If you only like to view data in tables, stop reading and watch this TED Talk presentation by Aaron Koblin. When it changes your mind that data can be even cooler when displayed well, come on back and finish reading this article.

If you have already seen this video or you don’t need to be convinced that presenting data in interesting ways is a great idea, keep reading. This article will discuss why getting data out of tables and into some form of visualization can be a helpful tool to tell a story of what all those numbers mean. It will also provide a nice short list of resources to help get a data visualization project off the ground, from the data cleaning...
phase to a final product.

You may already be using data visualization by converting data into a chart in a Microsoft Office product or by creating a Word Cloud (or Tag Cloud). I’m sure you have seen or have used del.icio.us or Wordle. Maybe you have a word cloud hanging in your office that displays words used to describe how awesome libraries are.

**Why represent data visually?**

In a 2008 article, Vitaly Friedman stated that:

> "The main goal of data visualization is to communicate information clearly and effectively through graphical means. It doesn't mean that data visualization needs to look boring to be functional or extremely sophisticated to look beautiful. To convey ideas effectively, both aesthetic form and functionality need to go hand in hand, providing insights into a rather sparse and complex data set by communicating its key-aspects in a more intuitive way. Yet designers often fail to achieve a balance between form and function, creating gorgeous data visualizations which fail to serve their main purpose — to communicate information."

A good reason to use data visualization techniques is well stated by Viegas and Walttenberg, "ideal visualization should not merely communicate clearly, but stimulate viewer engagement and attention."

**What data can be displayed?**

There are many types of data to display, such as: mind maps, number of ILL transactions, office consults, web sites, articles, resources, etc. The folks at webdesignerdepot.com have a great list of "50 Great Examples of Data Visualization." In a 2010 article published in ACMQueue, the authors discuss some techniques they use in visualizing and interacting with diverse data sets, "A Tour through the Visualization Zoo." This article also provides statistics on the incredible amount of data that is being processed today and is worth a slow scan.

**Free Data Visualization Tools**

This list of free data visualization tools is based on a Computerworld article, "22 free tools for data visualization and analysis." For ease of access, I have pulled the list and added a description of each tool (from the tool’s site). The article provides more information on each tool, including pros and cons as well as links to training on the products (where available).

**Data Cleaning**

- DataWrangler – an interactive tool for data cleaning and transformation.
- Google Refine – a tool for working with messy data, cleaning it up, transforming it from one format into another, extending it with web services, and linking it to databases like Freebase.

**Statistical Analysis**


**Visualization Applications & Services**

- Google Fusion Table – an experimental data visualization web application to gather, visualize, and share data tables.
- **Quadrigram** – visual editor that lets you design and customize interactive data visualizations.
- **Tableau Public** – free data visualization tool to help create an interactive viz and embed it in your website or share it.
- **VIDI** – data-visualization modules (for Drupal) – for anyone to use on any standard set of data ranging from government databases to demographics and statistics.

### Code Help: Wizards, libraries, APIs

- **Exhibit** – create web pages with advanced text search and filtering functionalities, with interactive maps, timelines, and other visualizations.
- **Google Chart Tools** – a way to visualize data on your website. From simple line charts to complex hierarchical tree maps.
- **JavaScript InfoVis Toolkit** – Create interactive data visualization for the web.
- **Protovis** – composes custom views of data with simple marks such as bars and dots.

### GIS/Mapping on the desktop

- **Quantum GIS (QGIS)** – Create, edit, visualize, analyze, and publish geospatial information.

### Web-based GIS mapping

- **OpenHeatMap, OpenLayers, OpenStreetMap** – creates and distributes free geographic data for the world.

### Temporal data analysis

- **TimeFlow Analytical Timeline** – is a visualization tool for temporal data.

### Text/word clouds

- **Softpedia – IBM Word-Cloud Generator** – IBM Word Cloud Generator is an application written in Java that can quickly and easily produce an image file beholding the most common words in a supplied text file aligned in various ways to fit in an organized layout.

### Social and other Network Analysis

- **Gephi** – an interactive visualization and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs.
- **Nodexl** – a free, open-source template for Microsoft Excel 2007, 2010 and 2013 that makes it easy to explore network graphs.

I know this is a lot of information to digest in a short amount of time. A class could be built around this topic. If you have any comments or questions about data visualization or if you have a project you would like to share, please email john.bramble@utah.edu

— John Bramble, Utah/Technology Coordinator

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**Patient Education Materials Assessment Tool (PEMAT for short!)**

How do you know if patients will understand and follow their instructions? A lot of patient handouts and patient education materials found online might give great information, but are
essentially useless if a patient can’t act upon that information. There are numerous tools for evaluating reading level and organization of information. These can be great for gauging if a patient will be able to understand, but they don’t tell you if the patient is able to take action!

Welcome PEMAT! The Patient Education Materials Assessment Tool from the Agency for Healthcare Research and Quality (AHRQ) is a tool to evaluate a patient handout or audio/visual material for its understandability and its actionability. This tool is a step-by-step evaluation with 26 items to check for and assess as a simple “yes” or “no.” There are separate items for print vs. audio/visual.

For example, when discussing nutrition, does the material provide a tangible tool, such as a meal planner or grocery checklist? If it does, it is actionable! A patient can immediately take action and start filling out the meal planner, or take the grocery list of healthy foods to the store that night. If the material does not include a tool, a patient might be educated on nutrition, they might academically know how to meal plan, but they haven’t actually done it or taken action upon their new knowledge of meal planning.

PEMAT helps check for actionability, where other assessment tools would not. While instructions such as, “patients should take twice daily” sound clear on their surface, PEMAT can help frame the instructions to be more actionable. “You should take one in the morning and one at night,” are clear, explicit instructions. These instructions address the reader/patient directly using the active voice, and tells what actions to take, as well as when they should take action. The first instructions tell patients what to do, but only a general idea of when. It is more actionable for a patient when they know what to do and exactly when to do it.

Hospital and health sciences librarians are occasionally asked about the reading level of a patient education handout, but oftentimes the actionability of the material is never questioned. Using PEMAT to score an article is a great way to illustrate that reading level is not the most important factor in effective materials. If the hospital or institution creates their own content for patient education, the librarian could suggest using PEMAT before publication or distribution. Additionally, when a librarian is searching for consumer health or patient education materials, and is unsure how useful or valuable an item might be to the patron, a quick check against PEMAT would be helpful in guiding the selection of materials.

You can use PEMAT to assess patient education materials by going here: http://www.ahrq.gov/pemat

-Monica Rogers, Health Information Literacy Coordinator

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Proving Your Worth

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In these difficult economic times, it can be tricky to prove your worth to an organization that seems to be focused on the bottom line dollar when your department doesn’t generate any dollars – or so they may think. I recently completed the “Toto, I don’t think we are in Kansas anymore: Walk ’n Talk Like a CFO” module in the MCR game “Librarians in the Wonderful Land of Oz.” One of the exercises involved creating a tool that would help measure a library’s return on investment, or ROI.

Here at Mercy Hospital in Springfield, Missouri, we have two libraries that serve the needs of the community and our co-workers – the Medical Library and the Van K. Smith Community Health Library. Our Medical Library Director, Holly Henderson, has developed a quarterly dashboard that we use and has proven valuable for “proving our worth” to leadership. The dashboard was created by utilizing parts of the NN/LM MCR’s “Valuing Library Services Calculator”, along with benchmark data from the Medical Library Association 2007/08 survey, (http://www.mlanet.org/resources/bench07/index.html). We identified service goals and measures that align with our institution’s strategic initiatives so we are able to prove the...
significance of keeping both the Medical Library and the Van K. Smith Community Health Library as valued units within the organization. We keep statistics for activities within both libraries such as number of articles delivered by librarians, number of articles retrieved by co-workers, questions answered, literature searches completed, numbers of books, audiovisuals, etc. utilized by patrons. We also break down these activities by co-worker user group, such as physicians, nurses, pharmacists, and other clinical and nonclinical co-workers. We give each activity a dollar value. For example:

| Number of articles delivered by Librarians | 2,070 |
| Estimated cost to purchase a single article | $35.00 |
| Value | $72,450 |

We then sum value calculations for all statistics to calculate an overall ROI number for the quarter. To calculate ROI we subtract the Total Costs (our library's operational expenses for the quarter) from our Total Value, divide this number by Total Costs and multiply by 100 to get a percentage rate of return. For every dollar spent by the libraries the rate of return has ranged from 135% to 199% over past quarters.

By tracking these sorts of numbers, you can give your upper management a quick snapshot of the value that your library brings to the organization as a whole. Our libraries report to Vice President of Mission Services and our VP, Lynda Schibler, sees the value this way:

"The dashboard provides a look at how the libraries are performing against other libraries. It also gives me metrics of usage that I am able to share with the Mercy board of directors. For specific groups such as community members, nursing and physicians, it gives me a picture of what groups are accessing and/or requesting materials. As we continue to utilize evidence based practices, I can share what different groups are utilizing the library and number of searches requested, etc. Nursing, as an example, has a research component to their evaluation. Our dashboard over a period of time has shown that this requirement has shown increases in usage by nursing. The dashboard is also aligned in language and design to our key dimension excellence which are drivers for our ministry."

Overall, our dashboard has been a very valuable exercise and enables us to “prove our worth” to leadership and establish our library as a viable, cost-saving entity with a high rate of return on investment.

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**Looking at MCR Library Closures:**

**What’s Happening and Why!**

Those of us in the biomedical / health information world are very aware that libraries specializing in the health sciences are closing every year at an alarming rate. A coordinator query in the DOCLINE membership database indicated that from 2011 through March 2015, 613 NN/LM member libraries closed across the nation. That’s an average of 115 closings per year. This graph shows library closures by NN/LM region.
In the MidContinental Region 25 libraries closed during this time period. We’ve broken out the libraries by type in the chart below.

Most of the closures in the MidContinental Region were hospital libraries (17) with a few academic or other libraries. It’s a safe assumption that most of the member libraries that closed in other regions were hospital libraries as well. What were the reasons for library closures in the MidContinental Region? We tried to document the reason in every case. The reasons that have been reported are:

- Attrition – When librarians retired, or moved on to other positions the institutions decided to not hire a replacement and library collections/services were eliminated.
- Corporate institutions downsized or restructured resulting in library closures.
- Libraries in the same system merged their collections/services into one library.
- Some hospitals reduced or eliminated the physical space of libraries and allocated it to other departments. The hospitals then relied on a virtual library which the hospital administrations eventually did not support.

Today's health care environment is shifting rapidly and is affected by enormous economic pressures. Though we are more aware of librarians and libraries than other healthcare professionals, the current environment is affecting them also. In a September 20, 2013 article in U.S. News & World Report HEALTH the Office of the Actuary for the Centers for Medicare & Medicaid Services stated "that by 2019 it expected hospitals, skilled nursing facilities and home health agencies would undergo a 15% reduction." The causes for these reductions are not simple according to Ron Stiver, Senior Vice President of Engagement and Public Affairs for Indiana University Health. In the same article, he cites not only the health care reform legislation but also a lack of Medicaid expansion, fewer inpatient volumes and decreasing payment rates as contributing factors to staff reductions. Those of us who work in hospitals are acutely aware of these circumstances.

Combining the reasons for library closures in the MCR listed above and the information gained from a brief Google search on hospital layoffs in major MCR cities it is easy to deduce that library closures were not the only location of employee layoffs. The search found an article listing the largest hospital/health systems...
layoffs from 2014. Among the layoffs that have affected our region are:

- Mercy, based in Chesterfield, MO, laid off 300 employees across three states in June 2014. The health system attributed the workforce reduction to a lack of Medicaid expansion in most of the states it serves.
- Englewood, CO based Catholic Health Initiatives cut 1,500 positions nationally early in 2015. The health system cited lower-than-expected operating and financial performance in the first quarter of the 2015 fiscal year caused by a reduced utilization of services as one of the main reasons for the cuts.
- SSM Health Care. The St. Louis-based system cut 586 positions through layoffs and attrition in 2014. Of the 586 eliminated jobs, 206 were in St. Louis.
- Via Christi Health. The Wichita, KS based system cut 4% of its workforce — roughly 350 or 400 positions — through layoffs and the elimination of vacant positions.
- Denver Health. The system announced plans in 2014 to reduce its workforce by 5% by cutting about 300 jobs through layoffs, attrition and a reduction in new hires.²

All of the health systems/hospitals listed above have either closed or downsized their libraries in the MCR. In this environment, how have the remaining libraries managed to stay open? How have some libraries and library systems managed to expand?

If you are interested in learning more about how successful librarians share their expertise, look for the upcoming release of our new member videos. Several librarians in our region have volunteered to share their effective practices with others; these videos will be located on the MCR web site – watch for the announcement! Also, the Values 2 Initiative from the MLA Hospital Library Section will be released soon. Watch for that as a source of good materials to inspire your advocacy efforts.

– Barbara Jones, Missouri/ Library Advocacy Coordinator
– Jim Honour, Wyoming /Member Services Coordinator

### Precision Medicine in Action

The Veteran’s Administration (VA) Office of Research and Development has been working to identify genes linked to post traumatic stress disorder (PTSD), high blood pressure, and heart disease. VA researchers have discovered that individuals with a certain form of the serotonin transporter gene 5-HTT are at a greater risk for PTSD and depression, information which helps individualize use and dosage of selective serotonin reuptake inhibitors (SSRI). They have also found that people with certain forms of angiotensin II receptor type-1 (AGTR1) may have an increased risk for high blood pressure, heart disease, and diabetes. This information can help clinicians develop a personalized preventative care program. Find out more on VA research.

Precision medicine can not only impact an individual, it can address health prevention in an entire community. In 2008, an OB/GYN began mapping children born into poverty in Gainesville, Florida. She was put in contact with a sheriff who was also interested in mapping, but her focus was the community’s incidence of crime. When the two women met, they discovered the maps matched exactly to a one square-mile area and further investigation showed the area also had the highest rate of domestic violence, child abuse, and neglect. But why? A ride around the area revealed a lot about the environment and lifestyles of community members. There was poorly maintained housing and a complete lack of access to services like child care, healthy food, and medical care – with the closest clinic a 2-hour bus ride away. Find out more about what happened to this community.

### The Role of the Librarian

Understanding genetics, the environmental effects on the human body, and strategies to make impactful lifestyle changes is complex. There are numerous resources made available by the National Library of Medicine and other authoritative agencies that librarians can utilize to help the patient, the consumer, the student, and the researcher navigate and make sense of this new horizon of medicine. No matter what your setting – public library, K-12, community college, medical library, academic library – the following sites can help you answer questions, enhance or develop curriculum, and connect physicians researchers with a wealth of databanks.

### Resources for Genetic and Environmental Health

#### Clinical
- Genetics Testing Registry – a central location for voluntary submission of genetic test information by providers.

#### Community College and University
- Environmental Health and Toxicology – portal links health professionals and consumers to many resources to understand the connection between the environment and human health and development.
- GeneEd – (Grades 9-12+) Links to vetted genetic web sites based on high school science curriculum. Includes lesson plans and current events.

#### Consumer and Patient Education
- Environmental Health and Toxicology – portal links health professionals and consumers to many resources to understand the connection between the environment and human health and development.
- Genetic Alliance – Nonprofit health advocacy organization committed to transforming health through genetics and promoting an environment of openness.
- NHGRI Talking Glossary – Genetic terms, images and animation. (English/Spanish).
- Office of Rare Diseases Research – Rare diseases information for patients, families, healthcare providers, researchers, educators, and students.
K-12

- **GeneEd** – (Grades 9-12+) Links to vetted genetic web sites based on high school science curriculum. Includes lesson plans and current events.
- **Genetics Home Reference** – (Grades 6-12+) Information about genetic conditions.
- **Harry Potter’s World: Renaissance Science, Magic, and Medicine** – Middle and high school lesson plans to review or learn genetics terms and concepts and applying them in identifying possible inheritance patterns and genotypes.

Genetics Professionals

- **ABGC Directory** – American Board of Genetic Counselors directory of board-certified genetic counselors.
- **ABMGG Directory** - American Board of Medical Genetics and Genomics directory of board-certified geneticists.
- **ACMG Genetics Clinics Database** – American College of Medical Genetics and Genomics database, with map-based views.
- **NCI Cancer Genetics Services Directory** – National Cancer Institute directory of professionals who provide cancer genetics services.
- **NSGC Directory** – National Society of Genetic Counselors directory.

Public Health

- **Environmental Health and Toxicology** – portal links health professionals and consumers to many resources to understand the connection between the environment and human health and development.
- **PHPartners** – a collaboration of U.S. government agencies, public health organizations, and health sciences libraries which provides timely, convenient access to selected public health resources on the Internet.
- **Public Health Genomics** – information on infectious diseases and noncommunicable diseases with a focus on human and pathogen genomics, genomic tests, family history, public health science, programs and practice, as well as policy and legislation.
- **National Information Center on Health Services Research and Health Care Technology (NICHSR)** – information and tools for the health services research community.

NIH Researcher Tools

- **GenBank** – an annotated collection of all publicly available DNA sequences.
- **Gene** – integrates information of a wide range of species. A record may include nomenclature, Reference Sequences (RefSeqs), maps, pathways, variations, phenotypes, and links to genome-, phenotype-, and locus-specific resources worldwide.
- **Genes and Expressions** – tools to help users query and download experiments and curated gene expression profiles.
- **Human Genome Resources** – integrated, one-stop, genomic information infrastructure for biomedical researchers so that they may use these data in their research efforts.
- **International HapMap Tool** - partnership of scientists and funding agencies to develop a public resource that will help researchers find genes associated with human disease and response to pharmaceuticals. (Participating countries: Canada, China, Japan, Nigeria, the United Kingdom, and the United States)
- **NCBI Webinars and Courses** – a series of webinars and courses led by NCBI staff who explain and demonstrate the use of various NCBI web resources with particular emphasis on recent changes and improvements.
- **OMIM** – comprehensive, authoritative compendium of human genes and genetic phenotypes that is freely available and updated daily.

Other

- Building a Large U.S. Cohort for Precision Medicine Research (Day 1) and (Day 2) – On February 11-12, 2015, NIH hosted a workshop to discuss the opportunities and challenges around building a large research cohort focused on precision medicine.
- **NIH Precision Medicine Initiative** – overview of this emerging approach to disease prevention and treatment.
- **P4 Medicine Institute** – the convergence of systems medicine, the digital revolution, and consumer-driven healthcare.
- **What is a Data Scientist?** – Mike Gualtieri, a principle analyst at Forrester Research, breaks down the
skill sets necessary to be a great data scientist.

-Dana Abbey, Colorado/Health Information Literacy Coordinator

**Health Insurance Literacy Tools**

**or “What good is it if I don’t know what I’m doing?!”**

Navigating health insurance can be a difficult and confusing process for even the most experienced health care consumers. For someone who has never had insurance before and never needed to navigate the health care system, it can be overwhelming. A patient cannot benefit from having insurance if they do not understand their benefits, or how to access services. This includes people who are unsure of where to go for services, how to make an appointment, or how to prepare for their visit with a health care provider. The following tools and websites can be helpful for librarians who work in public, hospital, school or health sciences libraries and need to assist patrons with insurance questions or finding appropriate care.

The Centers for Medicare and Medicaid Services oversees the From Coverage to Care initiative. This initiative aims to help people with new health care coverage to understand their benefits and connect with primary care and preventative services to improve their health. They offer an 8-step resource guide for patients including sections, “Know Where to go for Care,” with the companion consumer tool “Differences Between Your Provider’s Office and the Emergency Department,” “Make an Appointment,” and “Next Steps After Your Appointment,” among others. These resources are all available in English and Spanish. They also offer an 11-part series of videos covering the same topics that are available to watch online or download. These are also offered in both English and Spanish. These From Coverage to Care resources and additional promotional materials, sample tweets, and badges are available at: [https://marketplace.cms.gov/technical-assistance-resources/c2c.html](https://marketplace.cms.gov/technical-assistance-resources/c2c.html)

Additionally, CMS has supplemental information for special populations, including glossaries in multiple languages, lists of substance abuse and mental health services and providers, tools on enrollment for immigrants and refugees, multimedia resources and more. View the list of categories and select by topic here: [https://marketplace.cms.gov/outreach-and-education/outreach-and-education.html](https://marketplace.cms.gov/outreach-and-education/outreach-and-education.html)

CMS has more than just consumer health tools, they also offer a large collection of technical assistance resources on eligibility, enrollments, tax credits, exemptions, training materials for navigators, and much more. Available at: [https://marketplace.cms.gov/technical-assistance-resources/technical-assistance-resources.html](https://marketplace.cms.gov/technical-assistance-resources/technical-assistance-resources.html)

From Coverage to Care resources are written specifically for patient use, so sharing these resources directly with library patrons can be very beneficial. The CMS technical assistance resources are written to be accessible by the general public, however have a more narrow application for training navigators and community based organizations. These resources would be very useful for librarians who do outreach with community organizations that are interested in trainings or being involved as patient navigators.

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