**RESEARCHING EHR SYSTEMS WITH A PATIENT EDUCATION COMPONENT**

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**Acknowledgements**

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# Abstract

**Objective**: MedlinePlus Connect is a new service of the National Library of Medicine (NLM) that brings relevant consumer health information from the NLM’s MedlinePlus to patients or providers using an electronic health record (EHR). MedlinePlus Connect can potentially help users of EHRs fulfill optional Meaningful Use certification criterion 170.302(m): Patient-specific education resources. This project seeks to understand the depth and breadth of services similar to MedlinePlus Connect that provide a link to patient education information from an EHR.

**Methods**: An Associate Fellow from the National Library of Medicine (NLM) conducted an environmental scan of EHRs certified by the Office of the National Coordinator for Health Information Technology (ONC) that met certification criterion 170.302(m) to determine patient-specific education resources used frequently within these EHRs.

**Results**: A total of 13 patient-specific education information resources were identified. Six of these patient-specific education resources were used by two or more EHRs. While 80 percent of ONC certified EHRs met the ONC 170.302(m) certification criteria for the provision of patient-specific education resources, only 28 percent of ONC certified EHRs provide information about the actual patient-specific education resource vendor or product used within the EHR.

**Conclusions**: Information on patient-specific education resources and vendors was generally difficult to find and not readily available. Several frequently used patient-specific education resources were determined, including both licensed vendor products and proprietary EHR resources. Partnerships between resource vendors and EHRs are complicated and vendor roles within an EHR are often difficult to define from an EHR website. Future research is suggested since the number of ONC certified EHR products has increased and the certification process continues to evolve.

# Introduction

Since its establishment, the National Library of Medicine (NLM) has provided services and health information ranging from traditional reference to databases such as PubMed. The NLM continues to provide access to health information in innovative ways and a variety of settings. MedlinePlus Connect is one of the NLM’s newest services.

MedlinePlus Connect is a free service of the NLM and the National Institutes of Health (NIH) that allows electronic health record (EHR) systems to link to MedlinePlus information using existing code sets [1]. MedlinePlus is an online consumer health resource of the NLM and NIH that provides information about health topics (diseases, conditions, and wellness issues) as well as drugs and supplements. MedlinePlus currently provides information on over 800 diseases and condition health topics and drug information. Used within an EHR, MedlinePlus Connect matches ICD-9-CM (International Classification of Diseases, Ninth Revision, Clinical Modification) and SNOMED CT (Standardized Nomenclature of Medicine – Clinical Terms) CORE (Clinical Observations Recording and Encoding ) Problem List Subset codes to MedlinePlus consumer health topic pages and NDCs (National Drug Codes) or RXCUIs (RxNorm concept unique identifiers) to patient medication information [2]. The MedlinePlus Connect application programming interface (API) conforms to the Health Level 7 (HL7) Infobutton specifications.

The Health Information Technology for Economic and Clinical Health (HITECH) Act, enacted as part of the American Recovery and Reinvestment Act (ARRA) of 2009, supports the adoption and meaningful use of health information technology, including EHRs. As one result of the HITECH Act, EHR vendors need to link from an EHR to patient-specific education information. The Office of the National Coordinator for Health Information Technology (ONC) Temporary Certification Program was established in order to “provide a way for organizations to become authorized by the National Coordinator to test and certify electronic health record (EHR) technology” [3]. On November 12, 2010, two organizations were ONC Authorized Testing and Certification Bodies (ATCB). By January 2011, the list had expanded to six ATCBs. The ONC produces a Certified Health IT Product List (CHPL) that provides the current list of tested and certified Complete EHRs and EHR Modules under the ONC’s Temporary Certification Program, as well as a list of certification criteria. This list is updated on a continual basis. As of November 12, 2010 the certification criteria description provided by the National Institute of Standards and Technology (NIST) for 170.302(m): Patient-specific education resources, read that an EHR should “enable a user to electronically identify and provide patient-specific education resources according to, at a minimum, the data elements included in the patient’s: problem list; medication list; and laboratory test results as well as provide such resources to the patient” [4].

The NLM’s MedlinePlus Connect service can potentially help EHR users fulfill this need and achieve the optional Meaningful Use criterion stated in 170.302(m) to provide patient-specific education resources from inside the EHR system. MedlinePlus Connect currently does not provide information on lab tests, a requirement of the patient-specific education resource certification criteria.

The purpose of this NLM Associate Fall 2010 Project is to help the developers of MedlinePlus Connect understand the depth and breadth of other similar services that provide or link to patient education information from an EHR. To accomplish this task, the Associate Fellow conducted an environmental scan of all products that met the 170.302(m) provision of Patient-specific education resources criteria on the ONC Certified Health IT Product Certification list. *Appendix A: Original Project Proposal* outlines the initial purpose and framework of the project. This paper provides an outline of the steps taken while conducting the environmental scan, the questions and fields developed for analysis, and a discussion of key findings or missing areas as well as future areas for potential research.

# Methodology

This section outlines the process used to conduct the environmental scan as well as the process used to determine the fields used in the spreadsheet of EHR information and patient-specific education resources. *Appendix B: Project Meeting Timeline* provides an outline of meetings held between the Associate Fellow and the project team leaders.

To begin, the Associate determined a defined list of certified projects for 170.302(m) using the ONC CHPL. The Associate copied the entire ONC CHPL from November 12, 2010 from the ONC website to an Excel spreadsheet. The spreadsheet included all fields from the online ONC CHPL and the Associate added a field for whether products were certified for 170.302(m). The Associate accessed each ONC CHPL product record to determine if it was certified to provide patient education. The project team decided to use products certified as of November 12, 2010, regardless of future changes to the ONC CHPL, because of the rapidly changing nature of the provisional certification process and the relatively short timeline for the project. While the process was initially laborious and required entering each product record to view the certification criteria met by each product, the ONC has since changed the format used for the ONC CHPL. Users can now search the ONC CHPL according to particular certification criteria requirements, such as 170.302(m).

The Associate recorded additional fields of criteria besides 170.302(m), including 170.306(d)(1): electronic copy of patient clinical information; 170.306(d)(2): Electronic copy of patient discharge summary; and 170.306(e):Electronic copy of discharge instructions. The ONC has since revised these fields within the ONC CHPL and they are therefore not listed within the key or the final spreadsheet.

Once the Associate determined the CHPL list of EHRs with provisional certification that met the 170.302(m) certification criteria as of November 12, 2010, the rest of the spreadsheet was created and additional fields for analysis were determined and defined within the Excel spreadsheet. These fields, chosen for their relevance to the project and MedlinePlus Connect, provided the areas of investigation and focus for the environmental scan. The initial fields were refined after receiving two rounds of input from the project supervisors. The final fields are listed in *Appendix C: Fields and Definitions for EHR Spreadsheet.* Once the Associate determined the list of fields, the Associate conducted the scan, focusing on patient-specific education resources. One of the main goals considered during this process was to identify the course of the patient information for each of these EHR products. While conducting the scan, the patient-specific education resources were noted and compiled. The final patient-specific education resources are available in *Appendix D: Patient-Specific Education Resources*.

The Associate found patient-specific education resources in two main locations on the EHR vendor website: the partners page and the certified product page. The Associate also found a couple of patient-specific education resources by viewing tutorials or demos. The Associate first focused on only the certified product page but, after finding little information, expanded the search to the rest of the vendor website. The Associate made the assumption that if a patient-specific education resource provider was found on the vendor website, including the vendor’s partner page, then it was likely to be used within the ONC certified product. Because of this assumption and the fact that not all education resources were found on the certified product’s website, the information should be interpreted cautiously. The Associate noted in the spreadsheet if the information was found on the certified product page or if it was found on a partner page or tutorial, and therefore assumed to be applicable vendor wide. The majority of information about patient-specific education resources was found within the list of each EHR vendor’s partners. The resources were often listed as content partners but were frequently found within a long list of technical, reseller, and content partners. As noted above, the Associate found some information, often less frequently, through certified product demos or the EHR informational website pages.

The project team prioritized and sorted the final list of EHR vendors according to their frequency within the Brown-Wilson Group’s Black Book Rankings of top EMR vendors from 2011. Additionally, the Associate categorized EHR vendors by the practice or hospital size frequencies noted in the Black Book Rankings. The categorizations are defined and listed under “Market List Categories” in *Appendix C: Fields and Definitions for EHR Spreadsheet*. The incorporation of this information into the spreadsheet allows for future manipulation and sorting, based on data frequency within the Black Book Ranking list or the size of practice or hospital. Vendors not mentioned on the Black Book Ranking received a frequency of 0 and 0’s in each category of practice and hospital sizes.

# Results

Out of the 104 total EHR products included in this analysis, 83 (80%) met 170.302(m) certification criteria. This number includes six products added on December 27, 2010 after an analysis of Black Book vendor frequencies and supervisory input. These six products therefore reflect ONC CHPL data that is slightly different from the initial November 12, 2010 collection. The six additional products include: Paragon, Practice Partner, Medisoft Clinical, and Lytec from McKesson; Abraxas EMR from Abraxas; and AllScripts MyWay from AllScripts. Each of these products has a different date in the “Date Accessed from ONC” field.

In addition, 88 unique EHR vendors produced the 104 total EHR products. Therefore, a number of vendors made multiple EHR products or versions of products included within the CHPL. This number is relevant as the majority of patient-specific education resources are found on vendor partner pages and not on certified product pages. Therefore patient-specific education resources are generally discussed within this paper according to the vendor and not the product.

*Table 1: ONC CHPL Analysis Results* lists the results discussed below. Of the 83 products that met 170.302(m) certification criteria, 29 products provide information about their patient education information source on their website. Nine of these 29 products are used within the ONC certified product while 20 are mentioned somewhere on the vendor website (generally the partner page) and not specifically for the certified product.

The ONC CHPL provides information about the ONC Product Classification (Complete EHR or Modular) and the ONC Practice Setting (Ambulatory or Inpatient). The ONC CHPL contains 70 Complete EHRs and 34 Modular EHRs. The 70 Complete EHRs comprised 67% of the total products, with 69 Complete EHRs certified for 170.302(m) comprising 83% of products certified for 170.302(m). The 34 Modular EHRs comprised 33% of the total products, with 14 Modular EHRs certified for 170.302(m) comprising 17% of products certified for 170.302(m). In addition, the ONC CHPL contains 78 Ambulatory products and 26 Inpatient products. 63 Ambulatory products and 20 Inpatient products met the 170.302(m) certification criteria. It should be noted that some of the products that did not meet the criteria as of November 12, 2010 might meet the criteria as of the most recent ONC CHPL update.

Table 1: ONC CHPL Analysis Results

|  | **Total Number** | **Percentage of total EHR products** | **Percentage of total ONC CHPL products that met 170.302(m) criteria** |
| --- | --- | --- | --- |
| Total ONC CHPL EHR Products | 104 | 100% | - |
| Total ONC CHPL products that met 170.302(m) certification criteria as of 11/12/2010 | 83 | 79.8% | 100% |
| Products that provide information about patient-specific education resource vendors | 29 | 27.9% | 34.9% |
| Total patient-specific education resources found on partner page | 20 | 19.2% | 24.1% |
| Patient-specific education resources found on certified product page | 9 | 8.7% | 10.8% |
| Complete EHRs | 70 | 67.3% | 84.3% |
| Complete EHRs that met 170.302(m) | 69 | 66.3% | 83.1% |
| Modular EHRs | 34 | 32.7% | 41% |
| Modular EHRs that met 170.302(m) | 14 | 13.5% | 16.9% |
| Ambulatory EHRs | 78 | 75% | 94% |
| Ambulatory EHRs that met 170.302(m) | 63 | 60.6% | 75.9% |
| Inpatient EHRs | 26 | 25% | 31.3% |
| Inpatient EHRs that met 170.302(m) | 20 | 19.2% | 24.1% |

A total of 13 patient-specific education information sources resulted from the environmental scan. *Appendix D: Patient-Specific Education Resources* provides the patient education resource names and websites, vendors/products that mention the information source as a product partner or specific patient education vendor on their website, and a brief description. Six sources were used by two or more EHR systems:

* A.D.A.M.
* Krames (including Krames products: ExitWriter and wired.MD)
* HealthWise
* ExitCare
* Clinical Reference Systems Advisors Series / RelayHealth
* UpToDate (Wolters Kluwer)

# Discussion

The environmental scan of certified EHRs that met the 170.302(m) certification criteria provided a number of interesting results. Information on patient-specific education resources was generally difficult to find and not readily available. When available, this information was often found on the partners section of a vendor website and did not explicitly state that it provided patient education within the certified EHR. EHR vendors that explicitly stated who they used to meet the 170.302(m) certification criteria were infrequent. Users should cautiously interpret patient-specific education resources used within certified EHRs because of the ambiguous relationship between information sources listed on the vendor’s partner sites. While the final list of patient-specific education resources provides a good overview of additional products used to satisfy the 170.302(m) criteria, the list should also not be assumed to be exhaustive. Unfortunately, no good examples (demos or screenshots) were available to demonstrate how the patient-specific education resource is incorporated into the EHR workflow for the medical intermediary or the patient.

As noted above in Results, six sources were used by two or more EHR systems. The final list of patient-specific education sources of information is varied and includes resources created by EHR vendors as well as licensed products. Many of the sources, while competitors, list each other as partners or content providers. The partnership dynamics between patient education sources and EHR systems is complex and frankly confusing. For example, McKesson uses the Clinical Reference Systems Advisors Series from RelayHealth and RelayHealth is a division of McKesson. How exactly this influences the patient education resource, if at all, is uncertain. Many patient resources provide information from A.D.A.M. (e.g., Micromedex/Thomson Reuters, Healthline Networks) but A.D.A.M. is also used on its own as a provider of patient education within EHR systems.

At this time, the ONC does not require EHR vendors to state what products or outside vendors are used to meet each certification criterion. It was often difficult to determine a vendor’s exact role within the EHR, including vendors to consider as patient-specific education resources, when they were only listed on a “partners” webpage. While resources such as A.D.A.M. are widely considered as consumer health information resources others, such as UpToDate, provide both clinical and consumer resources. UpToDate was included in the spreadsheet and final list. While the inclusion of UpToDate is potentially problematic because of the uncertainty of its role within EHRs, it was included because it was listed as a Patient Education “partner” on at least one EHR, and UpToDate provides detailed information about their patient information resources.

Several resources that include a patient education component were not included within the final list of patient-specific education resources. After much debate, FirstDataBank was not included as a patient-specific education resource. FirstDataBank’s National Drug Data File (NDDF) Plus includes a Patient Education Module of drug monographs for use by pharmacists and point-of-care medical professionals with consumer education materials. While many vendors use FirstDataBank within their EHR and note it as a partner, it was not specifically listed as a provider of patient-specific education materials by any vendor. LDMGroup’s *CarePoints* resource was also not included since the patient education message appears to apply to a prescription at the point of pharmacy pick-up and it was never listed as a patient-education vendor. ZynxHealth, a company that was also frequently listed as a partner and that provides evidence-based clinical decision support, was another company removed from the list of patient-specific education resources because of a lack of evidence that they can or do provide patient-specific education resources. Lastly, Wiley was frequently listed as a partner but no evidence of patient-specific education materials was found on the Wiley website and no vendor specifically listed it as a patient-specific education resource. Additionally, a number of professional associations were listed as partners on vendor and product websites (e.g., BioMedix Vascular Solutions/Traknet Practice Management Software) but specific information about whether or not they provide patient-specific education resources within the EHR, even though they are created by many of these professional associates, was unavailable. Therefore, they are not listed in the final listing of patient-specific education resources. Such resources should be noted and tracked for future research.

# Recommendations

This section outlines suggestions for further research and analysis, with the understanding that the MedlinePlus Connect project is entering a dynamic health IT field.

Because of time limitations, this study was limited to patient-specific education information sources but a scan of other EHR aspects that relate to MedlinePlus Connect and other NLM research projects could be beneficial. For example, this scan attempted to note if education information was available through patient portals. Yet, many patient portal websites provided no information about education resources and primarily focused on their ability to simplify office billing and scheduling. Future research could also focus on ambulatory or inpatient EHRs, especially since the ONC has recently created slightly different certification criteria for each.

If the MedlinePlus Connect team decides to conduct further research on EHRs and their providers of patient-specific education material, waiting until the ONC CHPL list is finalized would be beneficial. The list changed at least three times during the duration of this brief project in both content and structure. While this initial scan provides information on the patient-specific education resource field, other resources could exist even if they were not currently listed on EHR websites. As the ONC website evolves and includes more information about certification criteria, it is recommended to check for additional 170.302(m) vendors. Reviewing the list of vendors who were ultimately not included in the final patient-specific education resource list, as noted in the Discussion section, is also recommended. An update to the list is recommended since many of the vendors or products that did not previously meet the 170.302(m) certification criteria could now be certified. The process appears to be constantly evolving. Additionally, the Associate found no examples of how an EHR integrates patient-specific education resources into its workflow. An illustrative example of how MedlinePlus Connect is implemented and used within a generic EHR would benefit potential users of the MedlinePlus Connect resource.

In conclusion, the project determined a solid list of patient-specific education information resources to be considered by the MedlinePlus Connect team. While this list cannot be assumed as complete because of the low percentage of 170.302(m) certified products that actually provide information about their patient-education resources, the list creates a starting point and initial list for future discussion, comparison, and research.

# References

1. MedlinePlus Connect: Linking Electronic Health Records (EHRs) to MedlinePlus Health Information [Internet]. Bethesda (MD): National Library of Medicine (US); [updated 2010 November 9; cited 2011 January 11]. Available from http://www.nlm.nih.gov/medlineplus/connect/overview.html
2. MedlinePlus Connect: Technical Information [Internet]. Bethesda (MD): National Library of Medicine (US); [updated 2010 November 15; cited 2011 January 11]. Available from http://www.nlm.nih.gov/medlineplus/connect/technical.html
3. Temporary Certification Program [Internet]. Bethesda (MD): National Library of Medicine (US); [updated 2010 October 1; cited January 11]. Available from http://healthit.hhs.gov/portal/server.pt?open=512&objID=2885&mode=2
4. Test Procedure for §170.302(m) Patient-specific education resources [Internet]. Gaithersburg (MD): National Institute of Standards and Technology; [updated 2010 August 13; cited 2011 January 11]. Available from http://healthcare.nist.gov/docs/170.302.m\_EducationResources\_v1.0.pdf

# Appendices

## Appendix A: Original Project Proposal

**Fall 2010 Project Proposal: Researching EHR Systems with a Patient Education Component**

Submitted by:
Stephanie Dennis, RWS, PSD

Description:
MedlinePlus Connect is a service that brings relevant consumer information from MedlinePlus to patients or providers using an Electronic Health Record (EHR). As we develop MedlinePlus Connect, it will be helpful to better understand the depth and breadth of such services available for providing patient education information. The optional Meaningful Use criterion to provide patient-specific education resources is focusing attention on providing these materials from inside an EHR.

An Associate would start with a defined list of known EHRs that meet the “patient education information” criteria, and investigate a number of questions, which may include:

* Parent Company
* Type of Customer - hospitals, outpatient practices, insurance companies, etc.
* Type of User - Is this built for a provider to find information for individuals, or is it built for individual patients?
* Source of patient education data
* Coverage of patient education data – diagnoses, lab tests, drug information, etc.

and other questions as discussed with the Associate and Project Leaders.

Expected Output:
A spreadsheet, perhaps with accompanying narrative that explains the uncovered answers for each system.

Expected Amount of Time:
60 hours, though it could take more or less time depending on available hours.

Project Leaders:
Joyce Backus, OC, PSD

Stephanie Dennis, RWS, PSD

Naomi Miller, OC, PSD

## Appendix B: Project Meeting Timeline

**October 2010**

October 20: Kathel Dunn, Coordinator of the Associate Fellowship Program, sends out the list of proposed Fall Projects to all Associates.

**November 2010**

November 5: Team members emailed. Begin work on MedlinePlus Connect.

November 9: MedlinePlus Connect formally announced by NLM

November12: Initial project meeting. Access granted to the MedlinePlus Connect Wiki and screenshots sent from the Institute for Family Health’s My Chart (Epic). Began determining spreadsheet fields.

November 29: Black Book Rankings released by iHealthBeat.

**December 2010**

December 2: Second project meeting. Edited spreadsheet fields and continued researching EHR vendors and patient-specific education resources.

December 17: Third project check-in meeting. Confirmed progress and discussed ONC changed.

December 27: Stephanie Dennis sent spreadsheet review. New ONC CHPL searching functionality revealed.

**January 2011**

January 4: Final project meeting. Discussed patient-specific education vendors.

January 12: Project report draft sent to team leaders

January 20: Draft report revisions and edits returned.

**February 2011**

February 4: Final project report submitted.

## Appendix C: Fields and Definitions for EHR Spreadsheet

|  |  |
| --- | --- |
| Field | Definition/Explanation |
| Vendor | Parent company that created the product. |
| Product | Certified EHR product or module. |
| Product Version | Product version certified by the ONC ATCB on November 12, 2010. |
| ONC Product Classification | Classification number assigned by ONC for each certified product. |
| ONC Practice Setting | Type of practice setting specified by ONC for product use. |
| 170.302(m) | Does the product meet certification criteria requirements for 170.302(m): patient-specific education resources? |
| Black Book Rank Freq. | Number of times a vendor was listed within Black Book Rankings top EMR Vendors for 2011 |
| Market List Categories: | Categories based on Black Book Rankings of EMR Software Vendors (http://www.healthcareitnews.com/news/black-book-rankings-names-top-emr-vendors-2011?page=0,0) |
| A | Ambulatory EMR Software Vendors: 1 - 5 Physician Practice |
| B | Ambulatory EMR Software Vendors: 6 - 25 Physician Practice |
| C | Ambulatory EMR Software Vendors: 26 - 99 Physician Practice |
| D | Ambulatory EMR Software Vendors: 100 - 249 Physician Practice |
| E | Ambulatory EMR Software Vendors: 250+ Physician Practice |
| F | Acute Care EMR Software Vendors: Small Hospitals (<100 beds) |
| G | Acute Care EMR Software Vendors: Community Hospitals (101 - 250 beds) |
| H | Acute Care EMR Software Vendors: Large Medical Centers/Hospitals (250+ beds) |
| I | Emergency Department EMR Software Vendors |
| Product URL | Link to main product page. |
| Demo URL | Link to demo page, if available. |
| Patient Education Info Source URL | Link to information about patient education source |
| Patient Education Info Source | Source used within the EHR for patient education |
| Coverage | Type of coverage provided by patient education source. Examples include: diagnoses, lab tests, drugs, etc. |
| Certified or vendor wide | Is the patient education source used only in the vendor's certified product or is it used in multiple vendor products and not specified for the certified product? |
| Direct Patient Access | Intermediary, Patient Portal, Both |
| Certifying ATCB | The ONC Authorized Testing and Certification Body (ATCB) responsible for inspecting and certifying the product. |
| ONC Certification # | Certification number assigned by ONC. |
| Date Accessed from ONC | The date the ONC Certification information was retrieved from the ONC CHPL.  |
| Notes | Additional items of interest or importance |

## Appendix D: Patient-Specific Education Resources

|  |  |  |
| --- | --- | --- |
| Patient Education Product | EHR Vendors/Products | Brief Description  |
| A.D.A.M.http://www.adam.com/ | 1. EPIC
2. eClinicalWorks/eClinicalWorks
3. Greenway Medical Technologies/PrimeSuite
 | A.D.A.M. provides a broad range of health information education and benefits technology solutions. Some of its health solutions products include its Health Illustrated Encyclopedia, its online consumer health Reference Libraries, Interactive Decision Tools, Specialty Programs for hospitals and healthcare organizations (including patient education handouts), and mobile technologies.  |
| Aprima Education Materialhttp://www.aprima.com/ehr-features/patient-education-advisors | 1. Aprima
 | Aprima Education Material from Patient Education Advisors includes customizable anatomical drawings and printed documents.  |
| Clinical Reference Systems Advisors Series / RelayHealthhttps://www.relayhealth.com/specific/hospitals/contactCenterMgt/advisorSeries/ | 1. McKesson/Lytec M
2. McKesson/Medisoft Clinical
3. McKesson/Practice Partner
4. eHealth Made Easy / eHealth Made Easy (RelayHealth)
5. HealthCare Systems, Inc. / HCS eMR (RelayHealth)
 | Clinical Reference Systems Advisor Series includes 9 different programs (Adult Health Advisor, Behavior Health Advisor, etc.) The topics are written and reviewed by physicians and nurses. The materials are available electronically. It provides 5000+ health topics and 6000+ medication products.  |
| DynoMed: Chartlogic Patient Educationhttp://www.chartlogic.com/products/chartlogic-patient-education.php | 1. ChartLogic/ChartLogic EMR
 | DynoMed was a developer of patient education software and medical multimedia programs, specifically focusing on orthopaedic, spine, and rheumatology issues. DynoMed was acquired by ChartLogic in 2004. Conditions and surgical procedure education is provided by the Chartlogic Brochure Maker , ChartLogic Orthopaedic Cinema , ChartLogic Orthopaedic Animator. |
| ExitCarehttp://www.exitcare.com/index.html | 1. MEDHOST/EDIS
2. EPIC
 | ExitCare provides patient Discharge Instructions and Patient Education using “well-structured, age-appropriate and understandable words and graphics to present complete and concise information in over 3,800 unique English topics and over 2,800 unique English & Spanish drug specific information sheets.” Information in multiple languages is available. ExitCare also provides an “enterprise-wide solution to include Ambulatory Care, ED and In-Patient care settings as well as hospital and office-based physician portals to support Epic's MyChart.”  |
| ExitWriter (Krames) http://www.exitwriter.com/ | 1. eClinicalWorks/eClinicalWorks
2. MEDHOST, Inc. / EDISx
 | Krames Exit-Writer After-Care Instructions provide information on “injury and illness diagnoses, medications, prescriptions, forms, diets, consents and lab tests”. They are designed for an emergency room setting.  |
| Healthline Networkshttp://www.healthline.com/ | 1. Universal EMR Solutions/Physician's Solution
 | Healthline uses a terminology database of “over one million medical terms and consumer friendly synonyms, as well as 250,000 medical concepts that include diseases, conditions, causes, symptoms, diagnoses, treatments, and other medically relevant attributes”. (http://www.healthline.com/aboutus.jsp) |
| HealthWisehttp://www.healthwise.org/ | 1. eClinicalWorks/eClinical Works
2. EPIC
3. GE Healthcare IT/Centricity Enterprise
4. NextGen Healthcare/NextGen Ambulatory HER
5. athenahealth
 | Healthwise® is a nonprofit organization that creates health content and patient education materials. Healthwise began in 1975 and provides evidence-based information that they create through their content development and medical review processes. Products include the Knowledgebase health encyclopedia, multimedia and interactive programs, a handbook, and mobile content.  |
| Krameshttp://www.krames.com | 1. eClinicalWorks/eClinicalWorks
2. Ingenix/Ingenix Care Tracker
3. MEDHOST/EDIS (ExitWriter)
 | Krames providers patient education materials, products, and services. Products include: 1500+ patient education print products (handouts), 400+ health education DVDs, Krames On-Demand®, Krames OnlineTM, Krames Exit-Writer®, Krames Go-to-GuidesTM, Krames Patient ConsentTM, and Krames WebConnect. |
| Micromedex/Thomson Reutershttp://interest.healthcare.thomsonreuters.com/content/GAW-PatientEd | 1. CPSI/CPSI | Micromedex provides the patient education products Carenotes and Consumer Health Solution. Carenotes allows providers to customize, print, and hand out nearly 7,000 documents on health conditions and instructions and “cover … conditions and procedures, lab tests to drugs to continuing health”. Multiple languages are available. Consumer Health Solution provides “Web-based patient education tools and features award-winning content from A.D.A.M. Inc. The frequently updated content is consistent with Micromedex drug and lab information and is presented in English and Spanish”.  |
| UpToDate (Wolters Kluwer)http://www.uptodate.com/patients/index.html | 1. eClinicalWorks/eClinicalWorks | While UpToDate is known for providing clinical information, it also provides patient education. Patients have access to UpToDate and can “learn more about a medical condition, better understand management and treatment options, and have a better dialogue with health care providers”. While basic services are free, there is also a for-fee option.  |
| WebMDhttp://www.webmd.com/ | 1. CompuLink/AdvantageEHR | WebMD provides health information and tools for health management. Health topics, drugs and supplements, and health solutions are some of WebMD’s services.  |
| wired.MD (Krames)http://www.wired.md/ | 1. EPIC  | wired.MD™ provides video patient education software. It uses the streaMed™ Patient Education Solution as a point of care tool. “335 patient education videos are available in as many as 8 languages, and it offers 1340 text handouts in English and Spanish”.  |