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Haley Haldeman

University of Arkansas, Fayetteville

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A Framework for Learning During an Honors Internship: Embold Health Inc.
An honors internship submitted in partial fulfillment of the requirements of the degree of
Bachelor of Science in Nursing
Haley Haldeman
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University of Arkansas

Introduction:

Embold Health Inc. is a health care analytics start-up company that identifies top performing providers using large data sets and clinically nuanced measurement. Over the past year as an intern, I've had a first-hand look into the complexity that surrounds data driven health care improvement.

There is a pressing need to address current trends in health care: In 2016, The United States spent \$10,348 per person, \$3.3 trillion dollars in total, on healthcare (NHE-Fact-Sheet, 2018). Research estimates that about 30% of these massive annual expenditures are spent on unnecessary, low value care (Castellucci, 2018). Low value or wasteful health care is costly, non-indicated care that does little or nothing to improve patient health. Although methods to assess value of provider care currently exist, these methods lack granulation and are based on measurement parameters that exclusively consider appropriateness of care (Colla, 2015).

A comprehensive assessment of quality, appropriateness, and cost is what Embold Health delivers. Embold gives payers more control in choosing providers within their region. Being able to identify top provider behaviors through rigorous data driven measurement is significant both clinically and commercially; it provides the opportunity to increase value of care, decrease waste, and drive down cost.

Learning objectives and outcomes: The following sub-sections will include several learning objectives that were approved by the committee prior to beginning the internship. Each objective will include a description of the activities completed related to the respective objective and then whether or not the objective was met.

Read literature and gain knowledge about the American health system, and the current measures of quality that are used:

The American health care system is confusing. From benefits packages and deductibles to prescription drug cost and accessibility, there are a lot of variables to account for when considering quality. At the very beginning of this internship, a large portion of time was dedicated to understanding how we consume health care services. In America, health care is regarded as a commodity; a service or product of value that can be sold or capitalized on.

Unlike products in other markets, there is a lack of transparency related to the cost of health care services, so much so that it is often difficult to discern the actual cost of a service. Considering the massive annual health care expenditures, the ambiguity surrounding the cost of services is concerning. In an effort to manage rising health care costs, there has been movement toward referenced-based pricing. In the referenced-based pricing model, reimbursement is based on a set percentage of what Medicare would pay for that same service. This pricing model can help to reduce health care costs by increasing transparency of service pricing (Livingston, 2019). The cost of service is typically taken into consideration when considering quality of care. However, cost and quality have a fluctuating relationship: the higher the cost doesn't always mean higher quality.

There are different resources available that assess the quality of health care performance at different organizational levels. An example of an evaluation tool is Hospital Compare created by CMS. This publicly available resource uses CMS data from Medicare approved hospitals to allow consumers to compare performance of up to three hospitals or providers, in a specific region. CMS uses 57 different quality measures to assess the care hospitals deliver. This information is beneficial in that it allows consumers a general overview into the hospital's overall performance (Measures and current data collection periods, 2019). The idea behind the

Hospital Compare tool is to encourage accountability and improve performance among hospitals by making evaluation data accessible.

While Hospital Compare can be beneficial for Medicaid recipients, there is little to no information regarding individual providers, apart from their contact information and locations. Hospital Compare's quality measures assess general adherence to safety guidelines rather than specific specialty behaviors that distinguish a poor provider from a good one. For more context, Hospital Compare might help consumers get an understanding of an inpatient institution's general performance (wait-times, infection rates, mortality rates, etc.) but offers no provider specific information.

During the past year of my internship, I got to see the American health system in action. As I begin the transition from student to clinician, understanding commercial components of health care enables me to be a stronger advocate for my patients. In terms of meeting the learning objective: I did a decent amount of research just to keep up with the terminology and day to day workings of Embold. I compiled some of the most relevant and impactful readings into an annotated bibliography included in the paper. Nearly all Embold employees have several advanced degrees and extensive experience in the healthcare industry. When I first started the internship, I had to work to keep up with such fast-paced intellects. Over the past year, I have grown confident in my understanding of the health care system and feel I am able to make meaningful contributions to the Embold team.

Having a more technical understanding of the company's mission allowed me to contribute a unique perspective; I had enough clinical and commercial experience to understand some of the more granular concepts but could offer insight regarding consumer perception.

While I cannot claim to understand and know specific details and inner workings of our health system, I do understand how the current structure affects the quality of care provided.

Develop an understanding of the relationship between data driven provider behavior and value of care using sophisticated data analytics and big data

Prior to this internship, I had virtually no experience with large data sets or analytics. There are still many complex components of analytic processes and statistical modeling that go well beyond my level of understanding. However, I now have a well-developed knowledge base related to the clinical significance of data driven improvement. Embold's label of "top provider" bears a lot of weight due to the robust and clinically nuanced validation process. Before I outline my hands-on involvement with the internal analytics team, I'll provide an overview of the analytic process to create some context for the work I got to participate in.

In order to be able to meaningfully quantify providers' performance in a given market and specialty, there need to be defined sets of standards for appropriateness, quality, and cost to measure against. These measures are essentially defining a baseline using current guidelines and standards. For example, a quality measure for primary care might look at the percentage of diabetic patients that had a retinal exam performed by the provider. Providers that have high rates of performing retinal exams on diabetic patients, which is in alignment with best practice, would be given a positive value for that specific measure. Embold Health has a scientific advisory board of senior health care professionals with expertise in measurement, and also uses resources such as the National Quality Forum (NQF) when building out measures.

As far as pinpointing actual provider behaviors, the company has access to insurance claims data. Determining top providers within a given geography is extremely complex. The process of statistical modeling and processing of claims data is beyond my scope and was not

something I focused on during this internship. In the most basic of terms, the claims data for each specialty gets processed and computed against the sets of measures that Embold's data scientist built. Measure results per specialty are then aggregated and analyzed to determine what providers Embold will recommend within a given geography. This analytic overview, while lacking extreme depth, serves to demonstrate the rigor of measurement used to determine which providers are top performers.

From the beginning of my internship, I had the privilege of working closely with Embold's data scientist. I helped compile spreadsheets of population data so that there is a better understanding of the geographical market. In addition to collecting the population estimate data, I helped with data validation. The data set I worked with was validated by comparing contractually received data to the data available at the market level.

More recently, I was able to help with the handoff from analytics team to the presentation team. I would take the raw data tables and graphs that the data scientist generated, and format them into PowerPoint presentations. These tasks, while tedious, helped me understand the level of credibility and the amount of sheer brain power behind this company and its mission.

Understand the employer's role in employee insurance and quality of care

Employers are having to deal with rising costs of providing health care benefits. As of 2017, The United States Census Bureau estimates that more than half of privately insured Americans receive coverage through their employer (Data Access and Dissemination Systems, 2018). Employers have a vested interest in the care their employees receive. Employers also have a considerable amount of power regarding the quality of care their employees have access to. As previously outlined in this paper, too often patients receive inappropriate treatments or diagnoses. The incidents of unnecessary and inappropriate treatments must be reduced, because

not only can they potentially harm the patient, they add to cost and reduce productivity. The idea behind Embold is to create a systematic way of evaluating providers so that employers can send their employees to doctors that are proven to be top performers.

Learn about and gain insight to the start-up business process

As an undergraduate nursing student, my experience with business endeavors was non-existent prior to this internship. There are a lot of complex and intricate moving parts that allow a business, especially a new one to function successfully. When I began my internship, Embold Health had about 5 full-time employees. There are now offices in both Austin and Nashville with about 20 full-time employees in various locations. When I was first beginning my internship, I asked the COO what their biggest focus was at the time. “Time management” she had told me. At the time, I thought this to be a rather mundane answer for a company that deals routinely with extreme complexity. But after a few months of attending team meetings, changing file sharing platforms, and watching the number of contractors and employees grow, I gained a newfound respect for managerial work and the art of managing time.

Initially, Embold used google mail and g-suite for email, conferencing, and file sharing. As the team and the workload grew, they made the switch to Microsoft office. As a result, I have become proficient in Microsoft excel, Microsoft teams, and am comfortable with video conferencing. The company communicates predominantly through video conferencing, though everyone travels and meets in person relatively often. For the past year, I got to participate in the weekly team meetings, and some of the weekly specialty team meetings. Watching the team dynamic and witnessing all of these incredibly intelligent and driven individuals interact was a great learning experience in itself.

The company's initial activities looked very different than the current workload. In the beginning, the main focus was around gathering the needed resources and solidifying an implementation plan with the initial client. Now that plan is being put into action, and the fast-paced work the company had been doing is even faster. Despite the increasing intensity, Embold Health is committed to delivering exactly what they promised: purposeful data driven innovation that improves our health care.

An Annotated Bibliography

Castellucci, M. (2018). Wasting away. *Modern Healthcare*, 48(11), 0016.

This article was published by Modern healthcare, a business publication that focuses on the healthcare industry. The article explored and analyzed the initiatives of various institutions that set out to reduce wasteful clinical practices. Johns Hopkins was reportedly able to save 2 million a year and conserve resources, other institutions showed decreased cost and increased appropriateness of services. The article explained the successful implementation of evidence-based practices into the clinical setting required information technology and staff adherence to education. The article presses in order to take steps towards eliminating wasteful clinical practice, organizations need data to identify wasteful practices. The challenge of incentivizing a change in provider behavior was mentioned several times throughout the article: doctors need an evidence based, data driven explanation to encourage behaviors that are higher quality. Creating methodology that is able to identify top provider behavior versus poor performing behaviors may help incentivize changes in provider practices.

Chen, W., Liang, Y., & Lin, Y. (2016). Is the united states in the middle of a healthcare bubble? *The European Journal of Health Economics : HEPAC*, 17(1), 99-111.

doi:<http://0-dx.doi.org.library.uark.edu/10.1007/s10198-015-0668-y>

This article was published by the European Journal of Health Economics and investigated the question of whether or not the United States healthcare system is experiencing an economic bubble. A bubble occurs when the cost of a service exceeds its intrinsic value. The study suggests that because the US cost of healthcare is exceeding both economic growth and rate of inflation, the sustainability of the healthcare industry needs to be addressed with policy. The study states that The United States healthcare system is currently in a bubble; meaning the amount of money Americans currently pay for some health care services exceed the value of the service itself. This economic bubble has been developing over the past 3 decades. The market stasis was driven by an increased interest in healthcare, coupled with expanded insurance coverage, and exacerbated by a lack of protective policy. The article states that the existence of an economic bubble in the healthcare system indicates a misallocation of resources, both private and public. In order to avoid further negative impacts on the sustainability of the healthcare industry, precautionary policies should be considered.

Colla, C. H., Morden, N. E., Sequist, T. D., Schpero, W. L., & Rosenthal, M. B. (2015).

Choosing wisely: prevalence and correlates of low-value health care services in the United States. *Journal Of General Internal Medicine*, 30(2), 221-228. doi: 10.1007/s11606-014-3070-z

This article published by the Journal of Internal Medicine, outlines the campaign called “Choosing Wisely” that aims to reduce wasteful and low value health care. This campaign developed claims-based algorithms used Medicare data to measure the prevalence of low value services. The analysis included 11 clinical services that were deemed low value based on recommendations from overlapping specialties, selected by physicians, economists, and a medicare claims data analyst. The results showed that the most prevalent low value services were

non-cardiac surgery (including pre-operative tests). The most spending associated with a low service was non-indicated use of antipsychotic drugs in dementia patients, which totaled 765.1 million dollars. Conclusively, this initiative measured the appropriateness of 11 different services and helped raised awareness of current level of non-indicated care occurring in the industry. While this study did a lot in the way of raising awareness about the over-use of unnecessary services, a methodology to identify higher quality of care that considers more than just appropriateness does not yet exist.

Data Access and Dissemination Systems (DADS). (2018, September 13). American FactFinder - Results. Retrieved April 10, 2019, from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS17_1YR_S2703&prodType=table

This 2017 data sheet from the United States Census Bureau separates the number of American citizens that have private insurance by different characteristics. The data sheet reported that of the 216 million Americans that have private insurance, approximately 55% received health insurance through an employer either alone, or in combination with another package. Because nearly 200 million Americans have employer based health benefits, it is imperative that employers seek out innovation in order to sustain current health benefits.

NHE-Fact-Sheet. (2018, February 14). Retrieved April 16, 2018, from <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html>

In 2016, The United States spent \$10,348 per person, \$3.3 trillion dollars in total, on healthcare. As of 2016, health care spending accounted for 17.9% of the United States' Gross Domestic

Product which is the largest single share of the economy. These figures are a part of the national health expenditure data and is provided by the Centers for Medicare and Medicaid Services. This information is critical to understanding the breadth and fiscal complexity of the American healthcare system.

Livingston, S. (2019). Montana's experiment in reference-based pricing has saved \$13.6M so

far. *Modern Healthcare*, 49(9), 32. Retrieved from <http://0-search.ebscohost.com.library.uark.edu/login.aspx?direct=true&db=bth&AN=135143295&site=ehost-live&scope=site>

In 2016, Montana negotiated with individual hospitals to establish set reimbursement rates for the state employee health care plan. The reimbursement rate varies hospital to hospital, but Montana's shift to reference-based pricing has already had measurable benefits. The state has saved a total of 13.6 million dollars since implementing the reimbursement model. Prior to the reference-based pricing, Montana's employee health plan spending was becoming unsustainable and there was virtually no transparency regarding health care service pricing.

Livingston, S. (2019). Setting the bar for hospital prices: North Carolina aims to tie

reimbursement to Medicare rates for state employees. *Modern Healthcare*, 49(9), 30.

Retrieved from <http://0-search.ebscohost.com.library.uark.edu/login.aspx?direct=true&db=bth&AN=135143296&site=ehost-live&scope=site>

In North Carolina, state employees will benefit from a new level of transparency concerning the pricing of health care services. The 2020 state health plan will pay providers a set percentage above the Medicare rate. Hospital administrators insist that this plan will cause hospitals to lose

money, ultimately forcing them to cut back services. Other experts suggest that the hospitals could indeed function fully with the set pay rate, as long as they manage their resources efficiently. This movement toward reference-based pricing indicates that employers are invested in eliminating waste in health care spending. When looking to the future regarding employer provider coverage, it is critical to consider not only elimination of wasteful spending, but also improvement of clinical outcomes.

Measures and current data collection periods. (2019, March 21). Retrieved April 14, 2019, from <https://www.medicare.gov/hospitalcompare/Data/Data-Updated.html>

Hospital Compare is a quality evaluation tool created by Centers for Medicaid and Medicare Services (CMS). This tool uses 57 different measures to assess the overall performance of a medical institution. The measures include subjective reports from patient satisfaction surveys, in addition to some claims-based measures. These measures are not specific to any specialty and offer no clinical information regarding provider performance. This evaluation tool allows consumers to get a general understanding of an institutions performance as it related to minimum competencies. Ultimately, while this tool can be helpful when questioning a hospitals adherence to safety standards, it does not help guide consumers to specific providers.

Public Reporting as a Quality Improvement Strategy: A Systematic Review of the Multiple Pathways Public Reporting May Influence Quality of Health Care. (2011, August 17). Retrieved March 16, 2019, from <https://effectivehealthcare.ahrq.gov/topics/public-reporting-quality-improvement/research-protocol>

Public reporting provides information to large audiences about individual providers, provider groups, and institutions. This article suggests that public reporting in health care may help to

bridge the gap in quality of care desired and quality of care obtained. Researchers conducted a systematic review of 198 studies to examine if public reporting improved health care delivery or changed provider behaviors. The review found only weak evidence that public reporting influences provider selection by payers. This relationship, or rather lack thereof, could be due in part to the current availability of public reports pertaining to the respective studies. Generally, the review found that public reports in the 198 studies lacked characteristic and contextual descriptions. For a more accurate assessment of the applicability of public reporting on health care, more specificity needs to be placed on the reports themselves.

Quality Measures. (2018, March 27). Retrieved April 9, 2019, from

<https://www.aafp.org/practice-management/improvement/measures.html>

The American Academy of Family Physicians' states that quality measures are used to assess various components of health care in order to improve patient care. Measures have the ability to identify strengths and weakness of specific services. This identification allows purposeful and guided improvement within the respective sub-specialties. Learning about what exactly these measures are and how they are utilized was critical in understanding the work that Embold Health is doing.