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Developing a Population Health Management Program for a Long-Term Care Insurance Product

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Abstract

Medical management programs traditionally have addressed more acute and short-term issues with chronic disease. Case management, disease management and historical utilization management have been focused largely on the needs of health plans, employers and near term payors of costs. With an increasing number of individuals entering the late preretirement years, the popularity of long-term care insurance (LTCI) has emerged as an important product within the insurance industry. Recognizing that many of the claims for long-term care originate with diseases that have clearly preventable etiologies, disease management would appear to be a reasonable consideration for inclusion in LTCI programs to reduce the number of claims, reduce the disease burden and hence claim costs, and prolong the healthy, premium paying portion of a claimant's life. We explore the issues and relationships between disease management and long-term care insurance.

Medical management programs, specifically disease management programs, developed out of the need for health insurers to impact short-term and intermediate term health care costs. Medical management programs focused initially on acute hospitalizations and injuries developing out of the case management environment within hospitals and early medical management models. Disease management programs are recognized as a further evolution of medical care management, in that they focus into the intermediate and future term through the activation of both primary as well as secondary prevention strategies.

Long-Term Care Insurance Basics

Long-Term Care Insurance (LTCI) carriers insure against the risk of loss of independence. Typically, when an individual loses independence due to the inability to perform two of six Activities of Daily Living or ADLs (bathing, walking, feeding one's self, toileting, transferring from a chair or bed and dressing independently) or from severe cognitive impairment, the LTCI company pays for the cost

of non-medical home care, assisted living care or nursing home care. The risks that lead to LTC usage are similar to those that cause acute care usage; however, they occur at a more advanced stage of disease, providing a longer window of opportunity to impact the process. The ultimate causes of institutionalization and loss of independence (Alzheimer's, fracture from falls, frailty) can often be traced back to the same chronic conditions or risky behavior that causes acute care costs.

An LTCI company's population of policyholders is fixed for long periods of time (policyholders tend to retain their policies for 10-, 20- or 30-plus years), the cost of claim is high (averaging around \$75,000 and increasing) and the number of claims are growing rapidly. LTCI carriers cannot drop coverage or increase prices easily to offset the growing risk.

General Approach

Although LTCI claims can develop fairly quickly, most develop over a longer time horizon of decades after the policy is issued. Due to the long time frame involved in the emergence of claims, developing a population health management program for LTCI products requires a different time horizon and some slight modification in approach. Principal activities of the disease management program will need to focus on primary and secondary prevention of future diseases that specifically are problematic for LTCI claims. Key to this effort is the intermittent collection of health and social related risk factors post underwriting and prior to an individual being eligible for claim under their LTCI coverage. Collection of emerging risk factors at various stages in the disease will ultimately lead to predictive modeling characteristics that will enhance actuarial premium calculation and reserves for LTCI, as it is beginning to in other health insurance products. This will undoubtedly shift the focus from acute illness to chronic preventable illness and to the reduction of future claim costs as measured by several discrete metrics:

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Once a claim has occurred, disease management principles can also be applied to reduce the short- and long-term claim exposure for the insurer and improve the quality of life for affected individuals.

- *Incidence Rate.* Disease management programs will need to address the underlying mechanisms of disease that can cause demand for long-term care among policyholders. Identification of risk factors and altering those that can be modified through interventions will be key drivers of this statistic. The prevalence of conditions and the frequency with which they evolve within an insured population have the potential to be modified for those conditions or portions of conditions that are sensitive to primary and secondary preventive measures and cost-effective medical management interventions.
- *Length of Claim (a.k.a., "length of stay").* The average length of claim duration for policyholders of a long-term care product is sensitive to age, sex and type of condition and policy type. These factors are collected and analyzed by actuaries in what are known as continuance tables. Efforts of disease management programs to effect stabilization or problem elimination for these populations have the potential to alter claim continuance dynamics and, thus, potential financial exposure.
- *Average Claims Cost and Salvage.* Medical management and disease management programs have the potential to reduce the intensity and cost of care, as well as the length of time that long-term care services are needed. Early, comprehensive intervention can facilitate an earlier return to independence, or enable a return that otherwise might not have occurred.

Once a claim has occurred, disease management principles can also be applied to reduce the short- and long-term claim exposure for the insurer and improve the quality of life for affected individuals. This process has already been developed in preliminary form for some diseases as part of standard disease management principles, particularly in geriatric populations, and addressing many common conditions that affect long-term care insureds.^{1,2,3,4,5,6,7}

Goals

Accordingly, a population health management program developed for an LTCI product should have the following goals:

- The program should reduce the incidence rate of the most common drivers of long-term care claims costs.
- The disease management programs should reduce the potential for recidivism or severity expansion through risk reduction, early identification and care coordination
- Disease management programs should improve "usual care" medical management of claimants by increasing cost effectiveness and lowering cost through shortened claim continuance and improved claim salvage.
- Population health management programs should actively address all of the above mechanisms in a way which is cost effective or profitable compared to no actions at all. In other words, the net present value of the future LTCI policy premiums minus the net present value of future policy benefits and expense costs minus the net present value of population health management program implementation expenses should increase overall profitability when compared to policies where no such population health management programs exist.

Approach

In keeping with those goals, we would propose the following approach in the development of a medical management program for the LTCI industry.

1. First, identify critical drivers of the most common LTCI claim exposures based on current policy coverage areas and a Pareto analysis of claim drivers. This information currently exists in a number of publications created within the industry, such as claims studies performed by the Society of Actuaries. An initial accounting of these conditions would include dementia (all causes), cardiovascular conditions including stroke, injuries, "frailty" and unplanned hospitalizations as the five leading causes of LTCI claims.

Recent studies from the Society of Actuaries have provided a general overview of these issues:⁸

The top conditions of interest are thus found to be:

- Alzheimer's
- Nervous System and Sense Organs

- Cardiovascular and Stroke
- Arthritis
- Respiratory
- Injury (such as falls)
- Digestive System
- Cancer

2. The program should acquire appropriate medical consultation regarding the principal drivers and evidence-based guidelines to both prevent and manage these types of events. Geriatricians, neurologists, psychiatrists and family practice medical literature have thoroughly documented the risk factors, cost drivers and general management strategies for these common claim areas. Basic information can also be found on www.guidelines.gov. Medical management programs should be developed for both primary and secondary prevention as well as for ongoing care management around evidence-based guidelines that are extant in the medical literature. This will not prove difficult given the large amount of information in these common condition areas.

Basically the approach will be to take evidence-based medicine—which projects risk and management strategies into the future—and run it in reverse, calculating what is important at each point in time before a common experience condition emerges. Programs will develop approaches to collect data about risk at these points in time, proactively manage elements that can have long-term impact and use the risk data and potential impactability information to project claims reserve and cash flow requirements for current and future insured populations.

3. A program will need to develop an identification algorithm that accurately and correctly defines individuals who have these conditions. This is an important step which is useful for both the definition of the condition as well as for tracking through various measurement indicators. Claims-based, health risk appraisal-based or questionnaire-based conditions will need to be tightly defined to minimize false positive and false negative identification to assure subsequent accurate modeling of future risk. The identification algorithms need to very carefully consider the

sensitivity and specificity of the algorithm with respect to identifying patients with the disease and with respect to future risk. A simple sort of individuals with a single claim for diabetes, for example, can produce false positive identification rates as high as the 30 percent range.

Of critical importance is developing a process by which the post underwriting and pre claim individual risk factors can be identified. This could be achieved through a combination of mailed and face-to-face health risk assessments structured to gather information on those risk factors most relevant to the loss of functioning or cognitive ability.

4. Activity-based efforts that alter the incidence rate, claim duration and average claim cost of these conditions should be identified and further researched. This is similar to, but not identical to, common disease management approaches. Again, evidence-based medical literature is replete with numerous inputs already in this process.

5. A baseline set of metrics should be developed around:

- Precondition risk (Health Risk Assessments: general or specific questions for example).
- Condition management with understood economic impact.
- Ongoing assessment of operational activity, clinical quality and utilization risk impact, and financial cost effectiveness.

The metrics will serve to both define a state of the population as well as to create a time series analysis for those engaged in the program developing risk and ultimately acquiring the long-term care diagnoses that trigger policy payments.

6. Metrics should also be ideally applied to a concurrent control group if possible. Long-term application of pre-post quasi scientific approaches may be all that is possible for an existing population, but potential control group follow-up through some additional mechanisms should be developed if possible.

7. A standard study design should be created to assure equivalence between the comparison

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and identified individuals being evaluated and should also address confounders, such as severity of illness or other factors which overtly affect outcome status.

8. After the appropriate identification of individuals, formation of metrics and initiation of an evidence-based medical management program begins, the program should then be regularly monitored to track the progress of the above approach. In an existing population where a guaranteed renewable policy may be ineffective, data collected might not necessarily affect short-term savings but, while potentially affecting long-term cost and chronicity of the conditions, regular measurement at appropriate intervals might also serve as the basis for predictive modeling and similar types of actuarial analyses that would more precisely identify risk and reduce uncertainty/variance in forward future calculations.
9. Assessment of impact for the programs developed should include a multidimensional model for potential purchasers of these services to correctly define the impact. Ongoing

operational oversight as a regular feature of the policy through disease management programs should decrease incidence rate, claim continuance and improve average claims cost and salvage. These should be demonstrable from both an operational as well as clinical basis. These should then transfer into dollars saved (both hard dollars, modeled dollars and imputed dollars), each calculated through different methodologies. Hard dollar savings can be inferred from comparison of managed population to populations without such management. Modeled savings can be generated from currently existing evidence-based guidelines and actuarial tables. Finally, imputed models of financial impact are also possible through similar means.

Example

As an example, one would approach this process for stroke in the following way:

One would define stroke as a specific set of symptoms and disabilities related to cerebrovascular accident, including intracerebral bleed, atherogenic ischemic stroke and multiinfarct dementia that have been diagnosed by a neurologist and associated with hospital admission claims with a given series of ICD-9 codes and/or provider-based diagnoses and procedures using CPT-4 codes. A standard method of identification is important to allow accurate description of risk, financial impact and longitudinal tracking.

Identification algorithms would specify exclusions such as short-term transient ischemic attacks, hemiplegic migraine and other conditions which might mimic the disease.

Identification algorithms might also include information obtained from self-reported questionnaires in use to identify risk of frailty, etc.

Evidence-based medicine suggests that a number of risk factors are strongly associated with stroke, including family history, smoking, hyperlipidemia, hypertension, diabetes and related conditions. Evidence for these precipitating agents should be collected on policy initiation and at regular intervals during the

insured's lifetime since many have the potential to be altered with disease management and medical management interventions.^{10,11,12,13}

Patient education should become an integral part of the evidence-based approach to insureds since it is well known that rapid access to appropriate therapy represents the strongest efforts to reducing severity and impact of stroke. Early recognition, transport to a stroke facility and rapid initiation of treatment carries the greatest impact in reducing long-term disability achieving the control of a well-educated patient population.

Disease management efforts with higher risk individuals can be initiated on a frequency developed by risk intervention and predictive modeling, particularly targeting modifiable risk factors in individuals at risk for the primary condition. General population education regarding primary risk reduction can be coupled with secondary risk reduction interventions (e.g., quit smoking, correct treatment of diabetes, early identification with hospital selection for stroke patients, etc).

Ongoing disease management interventions should include periodic check of blood pressure, glucose, smoking history and hyperlipidemia screening and treatments, among others. Collection and monitoring of both self-reported and claims-based information in an electronic medical record created in formats capable of sorting and later mining data will permit future evaluation of population risk dynamics.

Over time, serial questionnaires and risk information have the potential to develop a Markov cost model that might further refine and predict future disability costs. This, in turn, can be used in the development of premium estimates for new entrants at various ages and with various risk factors.

Disease management of individuals who have suffered an acute stroke can include developed case management, rehabilitation cost management and oversight of the usual recovery process.

Metrics

A number of metrics might be accumulated acutely and over time. Time series estimates of

metric progression will improve statistical estimates for future populations. Such statistics will include the following types of examples:

Operational Elements

- Individuals under management
- Risk factor breakdown and demographics for the population

Clinical Elements

- Basic clinical risk factor frequency distribution and changes over time
- Penetration of risk screening efforts
- Frailty index scores
- Baseline and periodic claims-based and self-reported compliance/adherence measures
- PRA Plus scores

Utilization Elements

- Claims/1000
- Cost of claim
- Disease emergence rates/1000

Independence Elements

- Days on claim
- Metrics related to salvage potential of the treatments

Intangible Elements

- Patient satisfaction with the program
- Purchaser feedback/satisfaction with the program

Conclusion

In conclusion, the approach of developing a population health management program for LTCI products needs to begin with clear definition of goals reached with the development of such a program. Identification of the critical drivers of LTCI claims costs followed by the application of evidence-based guidelines linked with solid metrics will direct the administration and evaluation of an optimal program designed to reduce continuance and improve salvage within these programs. Finally, the development from the beginning of a statistical model to approach a multidimensional model for economic impact can begin to show results on a very early basis and, if properly designed, continue to show refined justification for more sophisticated management rather than long-term statistical guesswork.



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