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REPORT



The Business Case for Becoming an Age-Friendly Health System

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Age-Friendly 
Health Systems

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the Institute for Healthcare Improvement in partnership
with the American Hospital Association and
the Catholic Health Association of the United States

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Executive Summary

What Is an Age-Friendly Health System?

An Age-Friendly Health System is one in which every older adult's care is:

- Guided by an essential set of evidence-based practices (“4Ms”);
- Causes no harms; and
- Is consistent with What Matters to the older adult and their family.

In an Age-Friendly Health System, value is optimized for all — patients, families, caregivers, health care providers, and the overall system.

Age-Friendly Health Systems use a set of four evidence-based elements to organize the care of older adults, known as the “4Ms”: What Matters, Medication, Mentation, and Mobility. The 4Ms are essential elements of high-quality care for older adults. When implemented together, they are expected to result in significant improvement in the care of these individuals.

While most health systems integrate some of the 4Ms into the care of some older adults, some of the time, an Age-Friendly Health System reliably uses all 4Ms to organize the care of every older adult, every day. An Age-Friendly Health System identifies where the 4Ms are in practice, realigns its resources to ensure they are implemented consistently, and eliminates care activities that are unnecessary under this regimen. Achieving reliable practice of the 4Ms can be accelerated by board and senior leader commitment to becoming age-friendly; establishment of age-friendly care as a strategic priority, including associated executive dashboard measures; patient and family engagement; and community partnership to support older adults as they move between community settings and health care facilities.

The Age-Friendly Health Systems initiative is the result of a collaboration between The John A. Hartford Foundation and the Institute for Healthcare Improvement (IHI), in partnership with the American Hospital Association (AHA) and the Catholic Health Association of the United States (CHA). The goal of the initiative is to spread the “4Ms” Framework of an Age-Friendly Health System to 20 percent of US hospitals and medical practices by 2020.

The Business Case for Becoming an Age-Friendly Health System

The business case for becoming an Age-Friendly Health System focuses on its financial returns. There are six steps in making a business case: 1) adopt a perspective; 2) determine additional costs; 3) estimate financial benefits; 4) estimate the return on investment (ROI); 5) compare the ROI to a hurdle rate; and 6) conduct sensitivity analysis.

The business case for becoming an Age-Friendly Health System is stronger when the financial benefits are captured by the health system that is making the investment; utilization and associated expenses of “usual” care are especially burdensome; the health system is effective in mitigating those costs; and the added expense of becoming age-friendly is lower.

Especially challenging is estimating the benefits of being an Age-Friendly Health System. These benefits accrue in three categories: 1) avoid costs associated with poor-quality care; 2) deliver care in a more cost-effective manner; and 3) enhance revenues from higher-quality care.

The benefits tend to fall into different categories depending on the care setting. In the inpatient setting, the major driver is reduced costs, resulting from fewer iatrogenic complications, fewer undesired medical interventions, and improved patient safety. These cost savings are reflected in the form of fewer and shorter hospital stays and lower costs per day. In the outpatient setting, by contrast, the gains come chiefly from added revenues resulting from expanding appropriate outpatient services.

In both settings, the increased use of cost-effective services can contribute to the business case for age-friendly care. Redesigning services can optimize the site of care by organizing care based on the What Matters element: the particular priorities and care preferences of older adults and their family caregivers. This approach often supports the transition of older adults from hospitals to lower-cost ambulatory care and home settings, ultimately reducing overutilization and increasing practices such as palliative care and home-based care.

This report presents two case studies of organizations working toward becoming Age-Friendly Health Systems. The first case study, in the outpatient context at St. Vincent Medical Group, focuses on Medicare's Annual Wellness Visit (AWV). The case demonstrates the income-generating power of an age-friendly AWV, which leads to advance care planning, appropriate screenings, and other encounters, all of which generate additional revenue. At St. Vincent, these services collectively have the potential to generate an estimated annual net income of about \$3.6 million.

The second case study, in the inpatient setting at Hartford Hospital, examines the business case for an age-friendly delirium prevention and treatment program. The case study focuses on the program's efforts to reduce the high costs of hospital stays complicated by delirium. The condition can add more than \$20,000 to the cost of a stay by lengthening it and increasing the daily intensity of care. Hartford Hospital's Age-Friendly program reduces costs and also generates revenue by freeing up hospital beds that can then be filled by other revenue-generating patients.

These case studies provide important lessons for health systems contemplating adopting the 4Ms Framework. The most important is that in order to make a convincing demonstration of ROI from the 4Ms, reliable and relevant clinical and financial data must be collected. The business case methodology described in this report will help an organization seeking to become an Age-Friendly Health System identify the relevant data, analyze it, and describe its financial implications.

Overview of Age-Friendly Health Systems

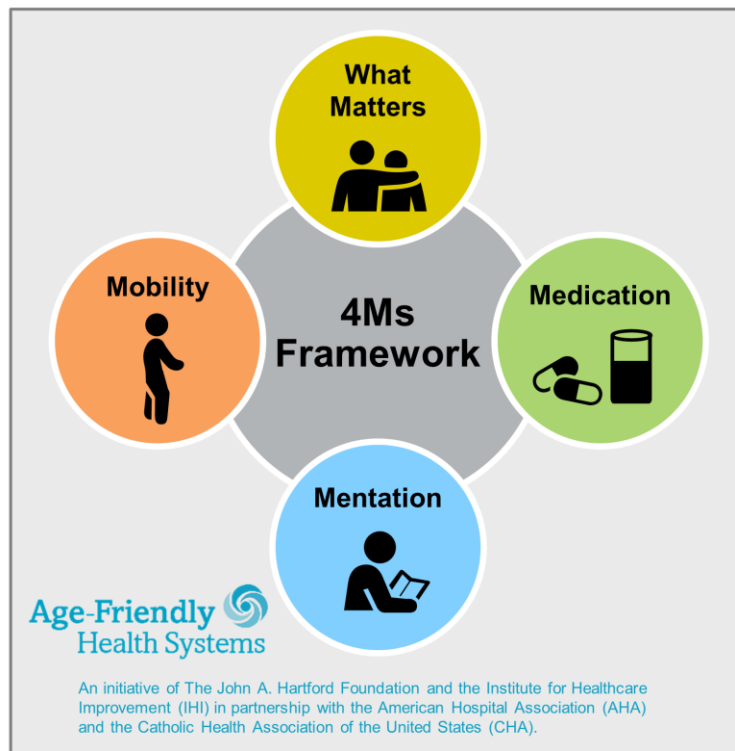
Becoming an Age-Friendly Health System entails reliably providing a set of four specific, evidence-based elements of care to all older adults, as needed, in your health system.

The “4Ms” Framework of an Age-Friendly Health System

In 2016, The John A. Hartford Foundation and the Institute for Healthcare Improvement (IHI), in partnership with the American Hospital Association (AHA) and the Catholic Health Association of the United States (CHA), launched the Age-Friendly Health Systems initiative, which adopted the bold aim that 20 percent of US hospitals and medical practices would become Age-Friendly Health Systems by the end of 2020. The “4Ms” Framework of an Age-Friendly Health System (see Figure 1) that emerged from this initiative is both evidence-based and reliably implementable across health care settings:¹

- **What Matters:** Know and align care with each older adult’s specific health outcome goals and care preferences including, but not limited to, end-of-life care, and across settings of care.
- **Medication:** If medication is necessary, use age-friendly medication that does not interfere with What Matters to the older adult, Mobility, or Mentation across settings of care.
- **Mentation:** Prevent, identify, treat, and manage dementia, depression, and delirium across care settings.
- **Mobility:** Ensure that older adults move safely every day to maintain function and do What Matters.

Figure 1. “4Ms” Framework of an Age-Friendly Health System



For related work, this graphic may be used in its entirety without requesting permission.
Graphic files and guidance at ihi.org/AgeFriendly

The 4Ms are the focus of the Age-Friendly Health Systems model because there is extremely strong evidence for their effectiveness. Performed together, they undergird and reinforce one another. The 4Ms enable older adults and their clinicians to be clear with family members and loved ones about What Matters; to use only Medications that are known not to impede What Matters, Mentation, and Mobility; to address cognitive impairment when it exists (Mentation); and to ensure that every day includes physical movement (Mobility). The 4Ms are a creative and simple way to bundle many of the evidenced-based, effective models of geriatric care.

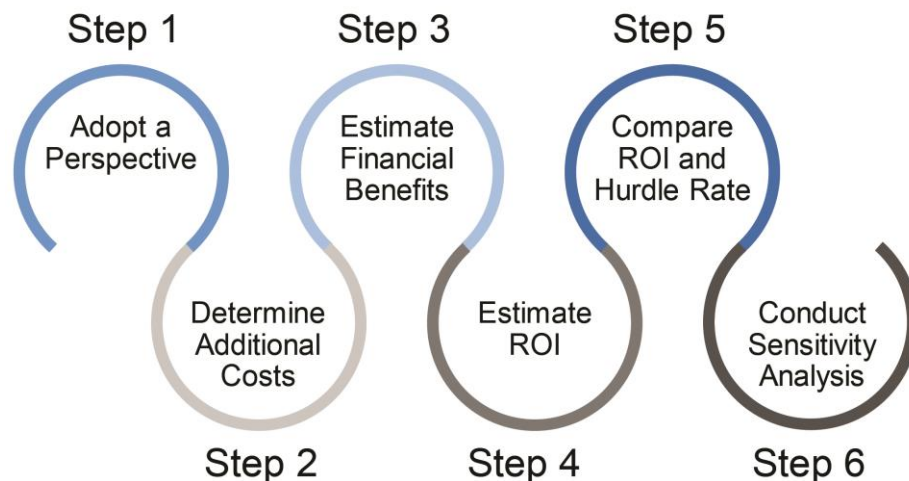
How to Make the Business Case for Becoming an Age-Friendly Health System

Making the business case means providing evidence regarding financial returns — the instrumental value — from investing in becoming an Age-Friendly Health System. The business case does not include improved outcomes or satisfaction — the intrinsic value — that result for patients and their families. If the Age-Friendly Health System can show instrumental value, however, its intrinsic value is more likely to be sustained.

Steps in Making the Business Case for Becoming an Age-Friendly Health System

Making the business case consists of six steps that are identical across care settings — inpatient, outpatient, or in the home (see Figure 2).

Figure 2. Steps in Making the Business Case for Becoming an Age-Friendly Health System



Step 1: Adopt a Perspective

The first step is to determine whose costs and whose financial benefits to consider. While the 4Ms may generate financial gains for a variety of stakeholders, only the financial consequences for the investing party (i.e., the health care organization making the investment) count in this analysis.

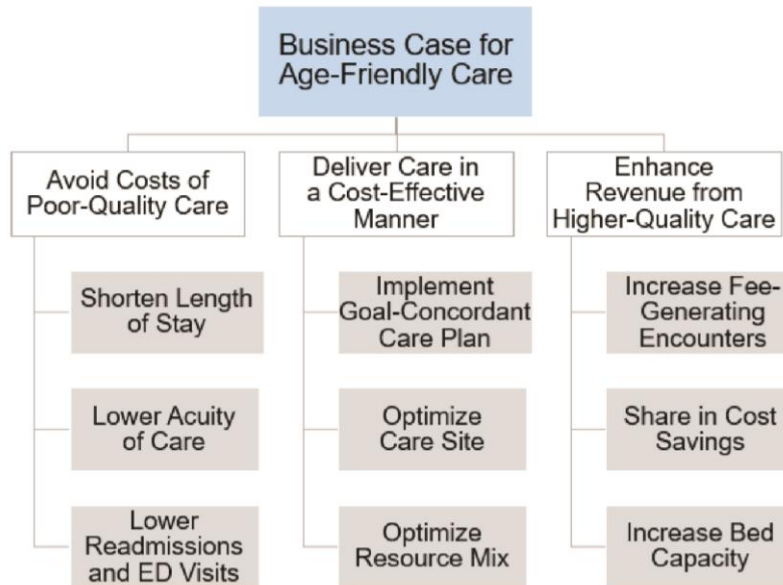
Step 2: Determine the Additional Costs of Becoming an Age-Friendly Health System

The next step is to assess any additional costs of providing age-friendly care relative to the status quo. The costs will generally be dominated by staffing expenses, although training, consulting costs, information technology (IT), supplies, and additional space and equipment are other possible expense categories. In many cases, health systems may redeploy existing staff resources to perform age-friendly care activities, and implementing the 4Ms could be cost-neutral.

Step 3: Estimate Financial Benefits

The financial benefits of becoming an Age-Friendly Health System fall into three broad categories. These categories, along with their respective drivers, are depicted in Figure 3 and explained below.

Figure 3. Financial Benefits of Becoming an Age-Friendly Health System



- **Avoid Costs of Poor-Quality Care**

An Age-Friendly Health System reduces costs in part by reducing poor-quality medical care. Cost avoidance stems principally from reductions in the incidence, duration, and acuity of hospital and post-acute care as well as readmissions and emergency department visits. (Whether the party that causes the savings also benefits from them is another matter, as mentioned above in Step 1.)

- **Deliver Care in a Cost-Effective Manner**

An Age-Friendly Health System can prosper financially by providing the right goal-concordant care, in the right place, and in the right way. For example, 1) intensive ambulatory care in the home for high-need older adults can substitute for more costly emergency department care; 2) inquiring into What Matters may result in fewer days in the intensive care unit (ICU), less specialty care, and more palliation; and 3) simple and inexpensive hydration, mobilization, and reorientation activities can replace less effective and more expensive antipsychotics in managing delirium.

- **Enhance Revenue from Higher-Quality Care**

An Age-Friendly Health System can augment revenue by increasing the number of appropriate encounters and interventions. One source of potential revenue is the Medicare Annual Wellness Visit (AWV) and resulting encounters such as advance care planning and health screenings.

Revenues can be augmented, too, through the quality improvement that characterizes age-friendly care. First, such care improves the patient experience, which positively influences survey results for the Consumer Assessment of Healthcare Providers and Systems (CAHPS) and Hospital CAHPS. Improved survey scores may assist in meeting quality improvement standards imposed by the Centers for Medicare & Medicaid Services (CMS) or health plans.² Second, value-enhancing care may lead to an improved reputation and increased market share. Shared savings and other arrangements designed to reward improvements in the quality of care are increasingly common and create further opportunities for bolstering revenues. Finally, age-friendly care can lead to fewer hospital admissions and readmissions and reduced length of stay (LOS). Capacity can then be released and the beds back-filled by other revenue-generating patients if such demand is available.

Step 4: Estimate the Return on Investment

Once gross benefits (i.e., the dollar sum of cost avoidance, new revenues, and financial gains from more cost-effective delivery models) are estimated, an Age-Friendly Health System will need to subtract the additional costs of implementing the 4Ms in order to determine the net income. Return on investment (ROI), often expressed as a percentage, is defined as net income divided by the program outlay.³

Step 5: Compare the ROI to a Hurdle Rate

Some health systems may be content with a cost-neutral program, while other systems may require a positive return that recognizes what the required resources could have earned in alternative uses. An organization will typically set a higher hurdle rate (i.e., the minimum required rate of return on a project or investment) when a high degree of uncertainty surrounds the accuracy of the ROI assessment. In that circumstance, the investment is riskier and that risk may need to be balanced by the prospect of a larger return.

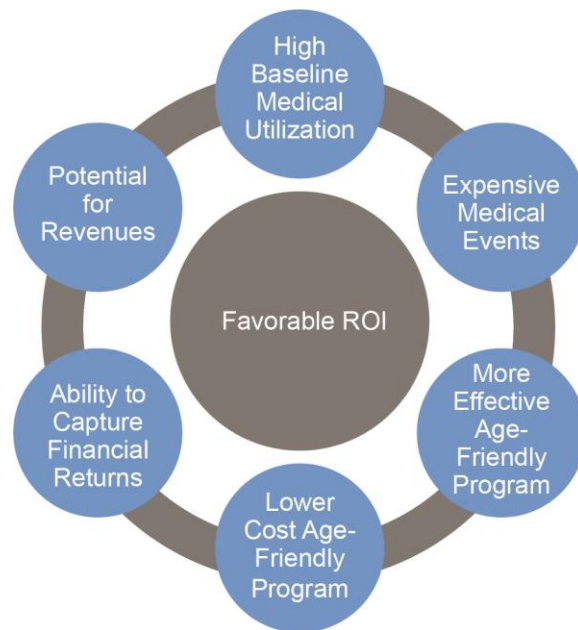
Step 6: Conduct Sensitivity Analysis

The values of the key variables in the ROI assessment will inevitably be subject to uncertainty and debate. So, instead of reporting a single ROI, it is wise for an Age-Friendly Health System advocate to suggest a probable range. A simple approach is to report the projected ROIs for at least two scenarios. In the first scenario, all independent variables that shape the ROI are assigned “pessimistic” values; in the second, these variables are either conservative or at their most likely levels. If the 4Ms are predicted to generate an ROI in excess of the hurdle rate, even under the more pessimistic set of assumptions, the business case might be considered more convincing.

Factors That Strengthen the Business Case for Becoming an Age-Friendly Health System

The strength of any business case is crucially dependent on the context and local information. However, six factors tend to strengthen the business case for any health care initiative, including becoming an Age-Friendly Health System (see Figure 4).

Figure 4. Factors Shaping a Favorable ROI



High Baseline Medical Utilization

The greater the predicted utilization under usual care, the greater the potential for an Age-Friendly Health System to deliver benefits in terms of averted medical events. Targeting individuals most at risk for future medical utilization will likely yield a higher ROI than targeting individuals who are lighter utilizers.

Expensive Medical Events

The total expense of medical utilization prior to implementation of the 4Ms represents the baseline from which cost savings will be calculated. Crucially, hospital admissions and readmissions constitute about 80 percent of the annual per capita medical costs for high-risk Medicare beneficiaries. Curtailing relatively cheap primary care visits does little to enhance the ROI; by the same token, should becoming an Age-Friendly Health System result in a larger number of primary care visits, any direct adverse impact on the ROI is likely to be minimal.

More Effective Age-Friendly Health System Program

Effectiveness in this context means the extent to which the 4Ms reduce unnecessary, unwanted medical utilization. The effectiveness of the Age-Friendly Health System program will depend on a number of factors, including the caliber of the leadership of the age-friendly care team; the motivation, skill, and experience of those who deliver the care; the comprehensiveness with which

all 4Ms are reliably integrated into care delivery; and the amount of resources dedicated to the program.

Lower Implementation Costs of an Age-Friendly Health System Program

Costs are lower when:

- The Age-Friendly Health System program is not forced to absorb a large portion of organizational overhead;
- The program is expected to run for several years, allowing for any upfront expenses to be spread out over time;
- The scale of the program is larger, allowing fixed costs of operation to be spread over more patients, thereby achieving economies of scale; and
- The health system can reallocate existing resources to 4M-related tasks and activities.

Ability of the Investing Party to Capture the Financial Returns

The cost savings may not accrue entirely to the organization that invests in age-friendly care. The manner in which a health system derives its revenues, and the degree to which it is at risk for costs of medical utilization, are profound influences on the strength of the business case. With an increased emphasis by CMS on at-risk contracting (e.g., value-based purchasing, accountable care organizations, Shared Savings Programs, and bundled payments), the business case for becoming an Age-Friendly Health System will be increasingly attractive.

Potential for the Age-Friendly Health System to Generate Additional Revenues

Additional revenues have financial consequences similar to reduced costs — both increase the ROI and make the business case stronger. Some financial analysts place a higher weight on a dollar gained than on a dollar saved, because it is so difficult to measure savings from averted medical events. The comparative certainty contributes to the financial appeal of an age-friendly AWV to a medical group. As noted earlier, there are several other circumstances under which an Age-Friendly Health System can contribute to the health system's top-line revenues.

Case Study: The Business Case for Becoming an Age-Friendly Health System — Outpatient Setting

St. Vincent Medical Group, Indianapolis, Indiana

St. Vincent Medical Group in Indiana is part of Ascension, a pioneer health system in the Age-Friendly Health Systems initiative. Ascension, one of the largest nonprofit health systems in the US, has more than 2,600 sites of care, including 151 hospitals and more than 50 senior living facilities, across 21 states and the District of Columbia.

During an interview with IHI, Ascension leaders stated that a priority in its Advanced Strategic Direction is to improve the profitability of Medicare reimbursement across the system, and they

believe that becoming an Age-Friendly Health System can contribute to narrowing the gap between Medicare revenues and costs. Specifically, Ascension is looking to expand the Medicare Annual Wellness Visit (AWV) to as many as 90 percent of eligible beneficiaries as a vehicle to address operating margins that are otherwise expected to decline over the coming years.

Ascension Medical Group (AMG), a physician-led provider organization within the Ascension system, has set a stretch target that 75 percent of eligible patients will have completed an AWV in the previous 12 months by the end of FY2019. The financial impact of expanding the AWV can be substantial, as this case study of St. Vincent Medical Group illustrates. St. Vincent Medical Group offers primary care in more than 100 sites throughout Indiana. The payment context for St. Vincent includes all Medicare payment plans.

AWVs were introduced by CMS in 2011 as part of the Affordable Care Act. Coverage is provided for a yearly visit to conduct a health risk assessment and to develop or update a beneficiary's personalized prevention plan.⁴ In March 2018, in collaboration with AMG, St. Vincent Center for Healthy Aging created a 4Ms-focused encounter template for the AWV. Within St. Vincent Medical Group, initial and subsequent AWVs are conducted by physicians or Medicare Wellness Nurses (MWNs), who are exclusively dedicated to providing these AWV encounters; approximately one-half of AWVs are conducted by each.⁵

St. Vincent ensures that What Matters is an explicit conversation with the patient. In part to reduce costs, St. Vincent is increasing the proportion of AWVs conducted by MWNs. In addition, St. Vincent has aligned with AMG in seeking to expand the percentage of eligible beneficiaries who participate in such visits from the current 40.5 percent to 75 percent by the end of FY2019. Both aims appear realistic given that the daily capacity of the MWN is six visits, but current MWN productivity averages about four visits per day.⁶

The St. Vincent case study illustrates the potential financial returns from approaching the AWV using a local adaptation of the 4Ms Framework.

Financial Returns from the Annual Wellness Visit

Under a fee-for-service system, the direct financial returns from providing the AWV can be attractive. These returns accrue from 1) the net income from the AWV itself; 2) the subsequent income-generating encounters that the AWV drives; and 3) potentially improved quality scores in value-based reimbursement programs. Another financial benefit, albeit indirect, is the decrease in unnecessary use of physician time.⁷

The fee received by St. Vincent for each AWV is currently about \$140, a blended average that considers the mix of initial and subsequent visits.⁸ The cost of a MWN-provided AWV is estimated to be about \$92.⁹ Thus, the net income margin for MWN-provided visits is \$48.

Additional financial benefits may derive from an increased number of advance care plans and preventive screenings resulting from the AWVs that would not have otherwise occurred. The next two sections discuss the financial gains from these two sources. (Note: It is also possible that AWVs generate additional income from added evaluation and management encounters, but that is not included as part of the analysis below.)

Net Income from the Advance Care Plan

The advance care plan (ACP) is a voluntary, face-to-face conversation between a physician (or other qualified health care professional such as a physician assistant, nurse practitioner, or certified clinical nurse specialist) and a patient concerning advance directives pertaining to future medical treatment, if the patient is not able to make decisions independently at that time.

Effective January 1, 2016, CMS began paying for the ACP under the Medicare Physician Fee Schedule (PFS). Since the AWV often touches on the patient's end-of-life goals, especially when What Matters is explicitly raised, that visit can prompt a subsequent ACP. Data from St. Vincent show that when an age-friendly AWV is provided (i.e., the AWV explicitly focuses on the 4Ms as the orientation for the visit), the probability of a subsequent ACP increases from 19.8 percent to 38.1 percent, thereby adding to the financial gains from the AWV.

There are two codes for the ACP: 1) code 99497 is designed as compensation for a 30-minute encounter and pays a clinician approximately \$80; and 2) code 99498 allows for an extension of the initial period and pays an additional \$71. At St. Vincent, both ACP codes are almost always used for what are typically lengthier consultations. The combined payments total about \$150. When conducted by a physician assistant, nurse practitioner, or certified clinical nurse specialist, all of whom are qualified to conduct ACPs, the cost of the ACP is estimated to be about \$83. This figure is based on an annual wage of \$100,000 for these providers and an assumed capacity of conducting five encounters per day. Allowing for an additional \$17 (20 percent) for possible indirect costs associated with each ACP results in a net income margin for each ACP of about \$50. In some cases the physician may conduct the ACP, which could minimally impact the net margin.¹⁰

Net Income from Preventive Screenings

There are 25 billable preventive screenings that can be prescribed under Medicare Part B. The AWV provides an opportunity to determine the appropriateness of services such as colorectal cancer screening, breast cancer screening, bone mass measurements, depression screening, and others. Thus, the AWV drives preventive screenings, which, for many medical groups, contribute to quality measures in addition to driving revenues directly.

As shown in Table 1 below, based on 2018 data from St. Vincent, the impact of the age-friendly AWV on the uptake of the four most common screenings can be quite large. For example, for falls screening, the provision of the AWV adds 31.5 percentage points to the probability that this screening will occur. For the purpose of illustration, if we assume that the net income from this screening is \$10, then the expected additional value of the AWV from the falls screening would be \$3.15 (31.5 percent of \$10). (Similar calculations for the three other screenings are reflected in the overall results in Table 2.)

Table 1. St. Vincent Medical Group Screening Rates: With Annual Wellness Visit (AWV) versus Without AWV

Screening Type	Total Annual Number of Screenings	Screening Rate with AWV	Screening Rate Without AWV	Total Number of Additional Screenings Due to the AWV
Falls	30,129	76.6%	45.1%	6,890
Depression	21,747	77.5%	38.7%	6,551
Colorectal Cancer	23,508	86.6%	61.0%	3,748
Breast Cancer	12,406	93.3%	67.5%	1,864

Overall Potential ROI from the AWV

By the end of 2019, St. Vincent Medical Group aims to expand the proportion of its eligible population that receives age-friendly AWVs to 75 percent of all eligible seniors, deploy their MWNs to conduct these visits, and increase the productivity of MWNs from four to six visits per day. If all of these efforts succeed, St. Vincent’s annual net income potential from age-friendly AWVs is projected to be about \$3.0 million. When the net income from screenings and from the ACPs attributable to the AWVs is included, that number rises to about \$3.6 million (see Table 2).

Table 2. St. Vincent Medical Group Annual Net Income Potential from Age-Friendly AWVs¹¹

Source of Net Income	Amount
Age-Friendly Annual Wellness Visits	\$3,003,000
Screenings	\$250,000
Advance Care Plans	\$385,000
Total	\$3,638,000

Summary

Under its Age-Friendly program, the expansion of ambulatory visits, and in particular age-friendly AWVs, is creating significant income-generating opportunities for St. Vincent and for the other medical groups in the Ascension system. If the net income from advance care plans and health screenings is added to the net income from the age-friendly AWVs, these changes have the potential to generate annual net income for St. Vincent of about \$3.6 million.

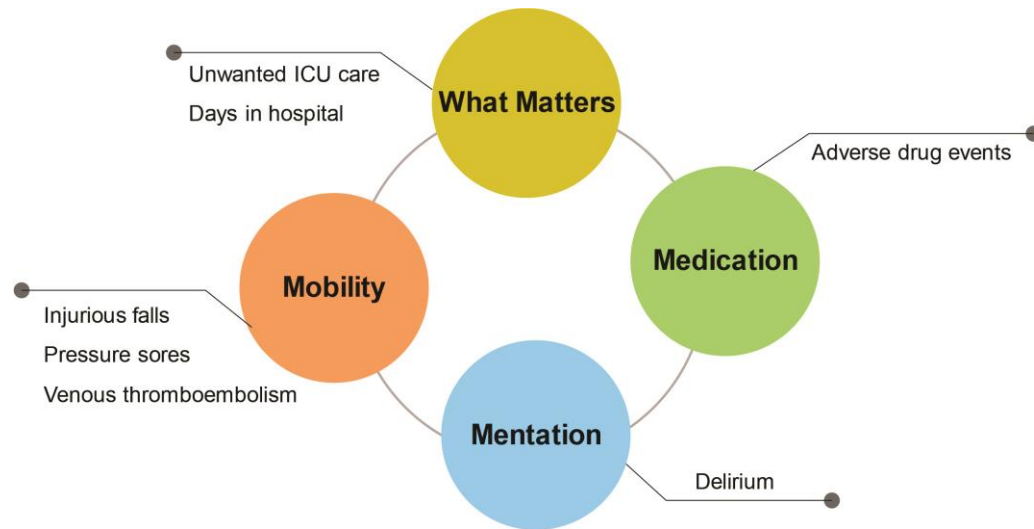
Note that other medical groups can replicate these calculations using their own data by accessing the IHI Age-Friendly Health Systems Outpatient ROI Calculator,¹² an Excel-based tool developed for assessing the business case for an age-friendly AWW.

Case Study: The Business Case for Becoming an Age-Friendly Health System — Inpatient Setting

Hartford Hospital, Hartford, Connecticut

The business case for implementing the 4Ms in a hospital setting is predicated mainly on the health care costs avoided through the elimination of poor-quality care. Figure 5 shows the most common and costly adverse events that the 4Ms may potentially avert. In the figure, although each event is linked to one specific “M,” in practice all 4Ms work synergistically against each negative outcome.

Figure 5. Adverse Events Potentially Averted by Implementing the 4Ms



Consequently, the business case for the 4Ms should account for all the negative events they potentially avert, events predicted to occur under typical hospital care. To illustrate how health systems can construct the business case, the following case study focuses on a single adverse event: the incidence of delirium. However, the approach to making the business case for averting other adverse events with the 4Ms is identical.

The business case for preventing delirium is based on lowering the hospital length of stay (LOS) and the daily cost. (The case would be even stronger were a hospital to bear some financial responsibility for its post-discharge or downstream sequelae: hospital-acquired delirium has been shown to increase nursing home placement and overall health care costs subsequent to hospital discharge.¹³)

This case study focuses on Hartford Hospital's ADAPT (Actions for Delirium Assessment Prevention and Treatment) program. Hartford Hospital is a participant in the IHI Age-Friendly Health Systems Action Community. ADAPT has generated sufficient data to make a plausible business case for its age-friendly approach to care. Hartford Hospital, an 867-bed teaching facility, is part of Hartford HealthCare, a comprehensive health care network in Connecticut. ADAPT was introduced there in 2012 and is currently led by Christine M. Waszynski, DNP, APRN, GNP-BC, and Robert S. Dicks, MD, FACP. ADAPT is now being implemented in multiple hospital units where more than 4,000 patients were seen in 2018.

ADAPT Strategies

ADAPT's delirium care pathway (see Appendix) is straightforward: screen all patients for delirium, prevent cases from developing, treat those that do, and manage cases that cannot be resolved. ADAPT is similar in most respects to the Hospital Elder Life Program (HELP), the widely studied and accepted standard of delirium care.¹⁴ ADAPT's evidence-based strategies are firmly grounded in the "4Ms" Framework of an Age-Friendly Health System. In addition to Mentation, the main category into which delirium falls, the pathway explicitly includes the individualized plan of care (What Matters), mobilization and falls prevention (Mobility), and avoiding or stopping potentially inappropriate medications (Medication).

Prevalence of Delirium at Hartford Hospital

ADAPT screens almost all patients for delirium because the hospital's data show that no age group or service line is immune to the condition. In 2018, diagnosed delirium varied between 5 percent to 50 percent in all hospitalized patients in the participating units. Delirium-positive rates vary by service, with coronary artery bypass grafting (CABG) being the highest, followed by trauma at slightly under 40 percent. Joint replacement had the lowest rate at about 5 percent. Current rates reflect implementation of ADAPT strategies, in the absence of which delirium rates presumably would have been higher.

Cost Avoidance with ADAPT Implementation

While the absence of data from a randomized control group makes it challenging to rigorously establish the ROI from ADAPT, the heavy financial burden that delirium imposes on this hospital, together with the low costs of ADAPT, sets up a plausibly strong business case for the efforts to prevent it.

Delirium cases are enormously expensive at Hartford Hospital. From July 2015 to June 2016, 35,700 hospital days were attributed to delirium, with hospital-incurred costs of about \$96 million.¹⁵ These delirium-related costs stem from an increased LOS combined with a higher cost per day, as shown in Table 3. Considering these two factors, delirium is responsible for adding more than \$22,000 to a hospital stay. Hartford Hospital data and published studies support the position that delirium alone, rather than other factors, is responsible for the dramatic increase in hospital LOS.¹⁶

The payer mix and payment systems under which Hartford Hospital operates ensure that the financial savings from ADAPT's prevention efforts accrue to the larger Hartford HealthCare system. Older patients are primarily traditional Medicare beneficiaries, although a small number fall under per-diem or per-case rates paid by health plans with which the system contracts. Under fee-for-service, lowering length of stay creates a financial benefit.

Table 3. Hartford Hospital Per-Patient Costs Associated with Delirium

	With Delirium	Without Delirium	Difference
Hospital length of stay	12 days	4 days	8 days
Daily cost	\$2,798	\$2,225	\$573
Total cost of stay*	\$31,284	\$8,900	\$22,384

*Note: The cost of a stay with delirium is based on the extra cost per day applying just to the eight added days.

It can be misleading, however, to use the cost figure of roughly \$22,000 (above in Table 3) as the financial return from preventing a case of delirium. The cost saving includes only the variable costs of that day, not the full costs, which include fixed elements that are unaffected by shorter stays. Thus, a conservative estimate, based on the assumption that fixed costs constitute 50 percent of the total, is that the financial benefit of an avoided delirium case is about \$11,000.¹⁷ Demonstrating a positive ROI requires evidence that the cost of preventing a case is less than that amount. The cost of preventing a delirium case is a calculation that requires knowledge of 1) the costs of implementing ADAPT and 2) its effectiveness in reducing the incidence of delirium.

ADAPT requires minimal outlays: about \$5 per patient for items (such as reader glasses, stuffed animals, personalized music, sleep eye masks) to improve function or provide comfort. There are, of course, indirect time-based costs for personnel. Additional time is required for ADAPT leadership tasks, for training (about two hours per nurse), for configuring the electronic health record, and for gathering and reporting data.

To date, Hartford Hospital has not attempted to convert these time requirements into a dollar equivalent. However, ADAPT’s leaders estimate that the total amount, including out-of-pocket and indirect costs, comes to no more than \$50 per patient. (Note that this cost is considerably lower than the costs for HELP. In 1999, HELP was reported to cost \$327 per patient, the equivalent of \$630 in 2019 dollars.¹⁸ The cost disparity is due to two factors: first, ADAPT relies more heavily on volunteers; and second, unlike HELP, ADAPT does not have specific personnel whose only function is to oversee the program.)

While no concrete data have yet been reported on ADAPT’s effectiveness, it is highly likely that it is cost-beneficial. A financial tool called breakeven analysis, used in the context of data gaps, suggests this likelihood. With this tool, we calculated the percentage of delirium cases that ADAPT must prevent in order to be cost-neutral. Then, we compared this breakeven threshold to what might be reasonably expected.

If the breakeven threshold is a lower number of prevented cases than expected, it is plausible that the program will generate a positive financial return. When the analysis is performed even under the conservative assumptions, the breakeven threshold is minimal and likely to be far beneath what might be reasonably expected. The breakeven threshold is only 2 percent when the cost per patient is \$100 and the value of a case prevented is \$5,000. Research from HELP supports the view that up to 40 percent of delirium cases are preventable.¹⁹

Summary

From the Hartford Hospital data and analysis applied to it, one might reasonably conclude that even under the most conservative scenarios, ADAPT should at least break even and probably perform far better than that. ADAPT, HELP, and other similar age-friendly initiatives to address delirium while also averting other iatrogenic events, such as falls, infections, and pressure sores, make a plausibly strong business case for their adoption. While the financial dimension is generally not the decisive factor for adopting the 4Ms, an attractive ROI should serve to encourage the scale-up and spread of age-friendly hospital care.

We invite organizations to use the IHI Age-Friendly Health Systems Inpatient ROI Calculator,¹² with their own data, to evaluate the business case for their inpatient 4Ms programs. This Excel-based calculator contains not only costs of delirium, but also some of the other potentially avoidable costs shown in Figure 5.

Lessons and Challenges

A review of the two case studies yields crucial lessons. These should serve to inform a business case for any organization that has become, or is considering becoming, an Age-Friendly Health System.

Lesson 1

There is no single business case for becoming an Age-Friendly Health System.

It would be misleading to claim that there is a single, consistently attractive business case for becoming an Age-Friendly Health System. There are simply too many variables that affect the ROI, including the setting (outpatient, inpatient, or in the home), how reliably the 4Ms are applied, the specifics of the population served, and the payment system under which the health system operates. The last two factors are so important that each warrants a separate lesson.

Lesson 2

The crucial factor underlying a strong business case is the health care organization's responsibility for a large portion of the total cost of care.

An Age-Friendly Health System is more likely to generate an attractive ROI if it is at risk for a substantial portion of the total cost of care and if it is rewarded for quality service delivery. But even under a fee-for-service system, hospitals are exposed to financial risk stemming from length of stay and cost per day.

Lesson 3

Risk stratification of the population eligible for age-friendly care may be advisable.

To the extent that age-friendly care involves a marginal cost relative to usual care, it will generally make financial sense to focus such care on patients with the greatest need and who incur the highest cost. (This financial consideration may conflict with the clinical imperative to provide better care to all, irrespective of their degree of need.) Extending the services to those at lower risk for expensive medical events may reduce the overall ROI, potentially beneath a financially

acceptable hurdle.²⁰ In the inpatient setting, for example, the risk of delirium is far greater for patients in postoperative thoracic surgery than in elective orthopedic surgery.²¹

Lesson 4

The 4Ms work collectively as a set of evidence-based elements; it is not possible to assess the individual contribution each of the 4Ms makes to the ROI.

The 4Ms work collectively and synergistically. For example, delirium prevention and treatment (Mentation) deliver significant financial benefits to hospitals. But a focus on Mentation alone may not reliably produce this outcome; Medication and Mobility also play important roles. And in the ambulatory setting, the Annual Wellness Visit is profitable by virtue of focusing on all 4Ms, including What Matters.

Lesson 5

Every site needs to collect its own data.

While published data on certain age-friendly activities may be available, it is strongly preferred that each site collect its own data since results will differ in each context. It is often challenging to collect the relevant data, but each health system needs to develop a plan for evaluating financial outcomes. That plan should begin by identifying the inputs for which data need to be collected.

The ROI calculators that IHI has made available will help health systems address this challenge by identifying the data requirements for making their own business case.¹² These calculators will also generate estimates of ROI ranges when the data are difficult to collect, and when there is uncertainty regarding their magnitudes.

Conclusion

While financial benefits are not the primary reason to become an Age-Friendly Health System, the business case can be compelling. Making the best possible business case requires certain general considerations, described in this report, as well as a deep understanding of your specific health care setting. We hope this report will furnish you with the tools to get started on your journey to providing age-friendly care.

Appendix: Hartford Hospital ADAPT Delirium Care Pathway

Confusion Assessment Method (CAM® or CAM-ICU®)

Element 1

Acute onset of mental status change from baseline or fluctuating mental status

AND

Element 2

Inattention

Element 3

Altered level of consciousness
Rass ≠ 0

AND either

Element 4

Disorganized thinking

OR

⊕ Positive = 1 + 2 + 3 OR 4

Unable to assess = RASS or mRASS
-4 or -5

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Modified Richmond Agitation Sedation Scale (mRASS)

+4 Combative	No attention, overly combative, violent, immediate danger to staff
+3 Very Agitated	Pulls tube(s) or catheter(s); fights environment/not people, difficult to get patient to pay or sustain attention
+2 Agitated	Frequent non-purposeful movement, uncooperative, loses attention rapidly
+1 Restless	Anxious but movements not aggressive or vigorous, cooperative, pays attention most of the time
0 Alert and Calm	Pays attention, makes eye contact, responds immediately
-1 Wakens Easily	Not fully alert, but has sustained awakening > 10 sec. Slightly drowsy
-2 Wakens Slowly	Briefly awakens with eye contact to voice < 10 sec. Very drowsy
-3 Difficult to Awaken	Movement or eye opening to voice but no eye contact
-4 Can't Stay Awake	No response to voice but displays movement or eye opening to physical stimulation. Arousable but no attention
-5 Unarousable	No response to voice or physical stimulation

(Chester, Harrington & Rudolph, 2012)

Potential Etiologies of Delirium

- D**rugs
- E**yes, ears, environment, emotions
- L**iver failure, low PO₂ (MI, PE, anemia, CVA)
- I**nfection, immobility
- R**estraints, respiratory
- I**njury, ictal state
- U**nfamiliar surroundings, under hydration
- M**etabolic

Deliriogenic Drugs to Limit/Avoid

- Diphenhydramine (Benadryl) *Alternative for allergic Rx is Claritin (Loratadine)*
- Lorazepam (Ativan) *Use only in patients dependent upon benzodiazepines or with potential ETOH withdrawal or terminal delirium*
- Zolpidem (Ambien) *Use 2.5 mg at bedtime if nonpharmacological measures fail*
- Metaclopramide
- Promethazine
- Prochlorperazine (Reglan, Phenergan, Compazine) *Alternative is Ondansetron (Zofran)*
- Famotidine (Pepcid) *Alternative is PPI except with Plavix, or Pantoprazole (Protonix)*
- Fentanyl *Alternative is Hydromorphone (Dilaudid), Acetaminophen (Tylenol), or Tramadol (Ultram)*

Medications to Not Stop Abruptly

- Acetylcholinesterase inhibitors
- Antiepileptics
- Benzodiazepines
- Opioids/narcotics
- Sedatives/hypnotics
- SSRIs
- Steroids

Delirium and Acute Encephalopathy are associated with Death, Disability, Deterioration and Discharge Difficulties

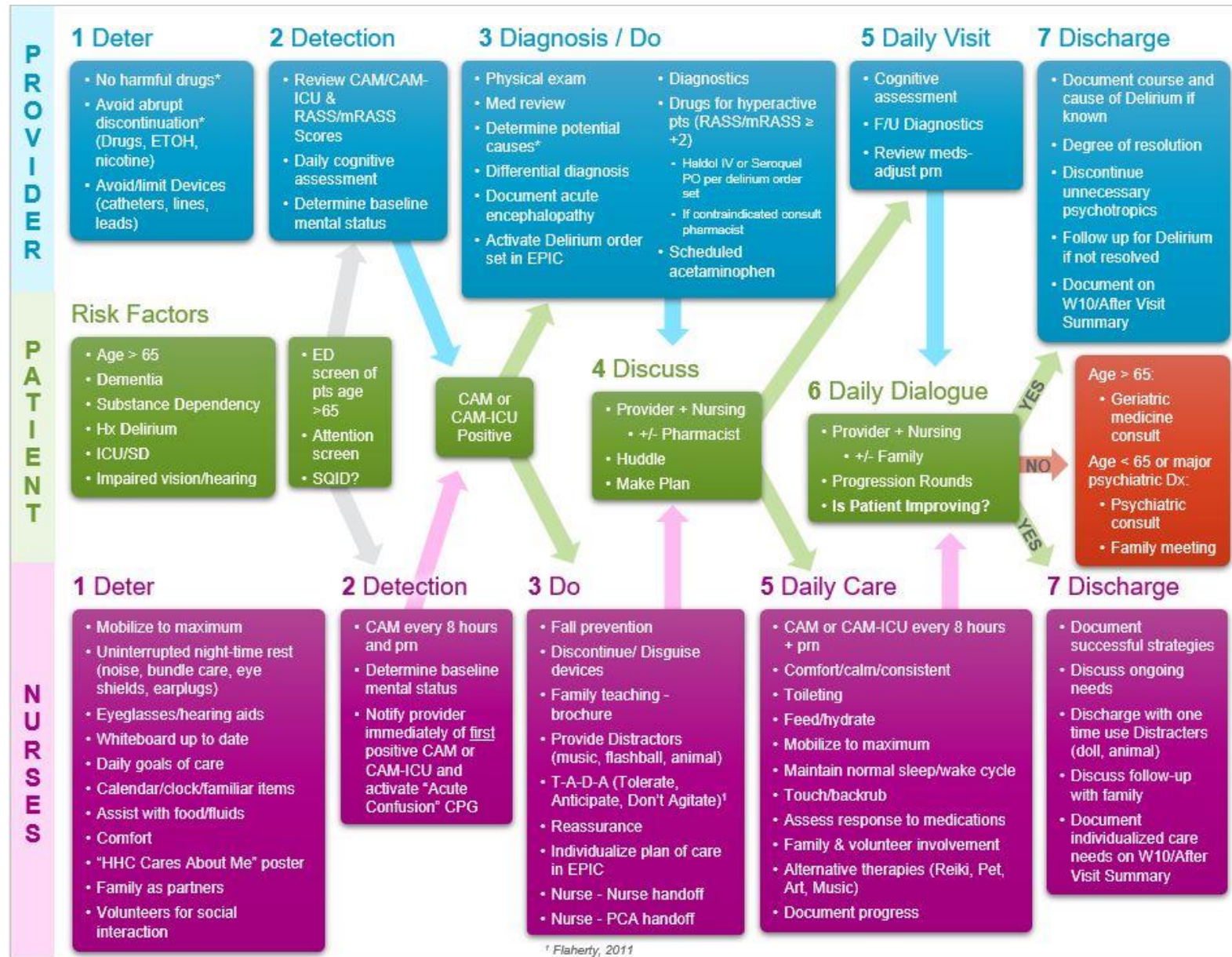
Delirium & Acute Encephalopathy Care Pathway



Save a Brain

Sponsored by ADAPT
Actions for Delirium Assessment
Prevention & Treatment





References

¹ Fulmer T, Mate KS, Berman A. The Age-Friendly Health System imperative. *Journal of the American Geriatric Society*. 2018 Jan;66(1):22-24.

² There is a practical difficulty in translating patient satisfaction scores into concrete dollar terms: there is no simple formula for converting one to the other. Consequently, when making the business case, these indirect and difficult-to-monetize benefits are often ignored. Omitting these factors will not materially weaken the business case since the direct and easier-to-monetize cost avoidance and revenue components alone are likely to be sufficient to make a solid business case.

³ In some instances, the ROI calculation is more complex because the financial returns from an annual outlay may accrue over more than one year. In that instance, the benefits must be aggregated over time, but only after they are placed in a present-value-equivalent form through discounting.

⁴ The Welcome to Medicare visit, unlike the initial and subsequent annual visits, must be conducted by a physician or a qualified non-physician practitioner, such as a physician assistant, nurse practitioner, or certified clinical nurse specialist. The Welcome to Medicare visits, which amount to about 6 percent of the total of all three types of visits at St. Vincent, do not explicitly focus on the 4Ms.

⁵ The initial and subsequent AWVs can be performed by physicians, physician assistants, nurse practitioners, and other licensed medical professionals. This can include registered nurses, registered dietitians, or nutritionists as long as they are a licensed professional and their state license allows them to perform the services. The MD/DO must provide direct supervision (in the office suite) of the service when billing under a Medicare provider number.

⁶ It will be challenging for the productivity of the entire cadre of MWNs to rise to the full capacity of six AWVs daily. Excess capacity in one practice cannot be balanced by excess demand elsewhere unless the practices are located near each other.

⁷ An additional advantage in the context of Medicare Advantage plans is that the AWV can provide an opportunity to update a patient's Hierarchical Condition Category (HCC) score.

⁸ In addition to the code corresponding to the Welcome to Medicare visit, there are two other Medicare AWV Current Procedural Terminology (CPT) codes: one is for an initial visit and the other for a subsequent one. Medicare currently pays \$161 to \$227 for an initial AWV and \$108 to \$152 for subsequent AWVs, depending on practice location. Comparable payments are made by Medicare Advantage health plans to medical groups with which they contract.

⁹ This is the sum of the MWN expense (\$83.33) and that of the physician who signs off on the visit (\$8.68). The MWN expense is based on an annual salary including benefits of \$80,000, with an assumed productivity of four AWVs daily for 48 weeks. The physician expense for an assumed five-minute sign-off is based on an annual salary of \$200,000.

¹⁰ Salary.com. <https://www.salary.com/about-us/>

¹¹ The calculation for annual net income from age-friendly AWVs (the first row in Table 2) assumes that: the number of beneficiaries is 56,111; 75 percent of beneficiaries receive visits of all three

types (Welcome to Medicare, initial, and subsequent); 5.8 percent of all visits are Welcome to Medicare and provided by more expensive (relative to the MWN) primary care physicians; the average payment per visit is \$140; the annual salary with benefits of a MWN is \$80,000; productivity of the MWN is 1,440 visits annually; and physician sign-off costs for documenting the AWV is \$8.68. The net income estimates from screenings and advance care plans (the second and third rows in Table 2) are based on the heightened probabilities reported in the text that the AWV will drive the volume of these subsequent events, and on assumed margins of \$10 for each of the screenings and \$50 for the ACP.

¹² The ROI Calculators, for both inpatient and outpatient settings, and accompanying instructions may be downloaded from IHI's website (ihi.org/AgeFriendly).

¹³ Leslie DL, Marcantonio, ER, Zhang Y, Leo-Summers L, Inouye SK. One-year health care costs associated with delirium in the elderly population. *Archives of Internal Medicine*. 2008 Jan 14;168(1):27-32.

¹⁴ ADAPT relies less heavily than HELP on volunteers for mobilization and feeding functions. By contrast, ADAPT relies more heavily on volunteers for patient visiting, conversing, and sensory stimulation.

¹⁵ Post-acute care costs are not considered here. Only 30 percent of patients with delirium are discharged to home; the percentage for those not experiencing delirium is 70 percent. Also not considered are the financial implications of the reduction in readmissions that ADAPT causes. From 2012 to 2015, the 30-day readmission rate for Confusion Assessment Method (CAM)-positive patients decreased from 14.8 percent to 11.8 percent. The comparable rate for CAM-negative patients decreased less during that period, from 10.8 percent to 9.7 percent.

¹⁶ Ely E, Gautam S, Margolin R, et al. The impact of delirium in the intensive care unit on hospital length of stay. *Intensive Care Medicine*. 2001 Dec;27(12):1892-1900.

¹⁷ Pantilat SZ. *Palliative Care in California: The Business Case for Hospital-Based Programs*. California HealthCare Foundation; November 2007. This is the source of the assumption that fixed costs are 50 percent of the total. If Hartford Hospital were to have a capacity issue with patients waiting to back-fill beds, then the financial benefit of delirium reduction and the resulting shorter stay would be higher than \$11,000 per day. In that case, the financial benefit would be equal to the bed-night revenue stemming from the patient who now occupies the released bed.

¹⁸ Inouye SK, Bogardus ST Jr, Charpentier PA, et al. A multicomponent intervention to prevent delirium in hospitalized older patients. *New England Journal of Medicine*. 1999 Mar 4;340(9):669-676.

¹⁹ Between 30 percent and 40 percent of cases are considered preventable. See: Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. *Lancet*. 2014 Mar 8;383(9920):911-922.

²⁰ This was the situation for an elders-at-home program. The health system declined to “graduate” those enrolled members who were no longer in need of the intensive, expensive, outpatient care. Over time, the patient mix thereby became less high-risk for acute care episodes that the program was designed to avert: the program's ROI drifted downward and its financial viability became threatened.

²¹ Evidence for this comes from Hartford Hospital.