



**Evaluation of CMMI Accountable Care
Organization Initiatives**

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Evaluation of Skilled Nursing Facility 3-Day Pioneer
ACO Waiver – Final Report

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EXECUTIVE SUMMARY

Starting in 2014, CMS offered Pioneer ACOs the option to apply for and implement a waiver of the 3-day prior hospitalization requirement before a skilled nursing facility (SNF) stay. Waiving this SNF 3-day prior hospitalization rule provides Pioneer ACOs, already accountable for the total cost of care for their aligned beneficiaries, with an additional lever for improving care and reducing Medicare costs of their aligned patients; 14 of the ACOs remaining at the end of the initial performance period used the waiver. Under this waiver, participating ACOs can send eligible, aligned patients to partner SNFs to receive Medicare-covered SNF services without a prior 3-day hospitalization. Across the 14 ACOs that participated in the SNF 3-day waiver, 4,301 patients were enrolled in 2014 and 2015.

The purpose of this analysis was to assess the impact of the waiver on the ACOs' operations and on beneficiary outcomes. Report findings rely on both qualitative and quantitative methods. To understand the participating ACOs, how they operated and their experiences under the waiver, we analyzed their application materials, reviewed the ACO Evaluation team's site visit files and conducted interviews with the ACOs. We used Medicare claims in 2014 and 2015 to identify patients using the SNF 3-day waiver and to examine their characteristics and outcomes using Medicare claims, SNF Minimum Data Set assessment data and market-level information.

We found that most of the waiver patients entered a SNF without a prior inpatient hospital admission, directly from the emergency department (ED) or after being in the hospital for observation without being admitted. Waiver patients without a prior inpatient hospitalization were generally similar in patient characteristics to those who had a prior inpatient hospitalization lasting fewer than three days. We did not find evidence that the availability of the waiver induced SNF use among patients who would otherwise have not used a SNF. However, we cannot conclude that the waiver did not induce any additional SNF use compared to a patient population with no waiver. Compared to ACO aligned non-waiver SNF patients who had a prior inpatient hospitalization lasting exactly three days, waiver patients had shorter SNF stays and lower Medicare expenditures (counting the period 30 days before the SNF stay through 30 days after the SNF stay). On the other hand, we also found that waiver use was associated with higher rates of ED visits and hospitalizations in the seven and 30 days following SNF discharge. We found similar associations after adjusting for the patients' probability of using SNF.

We also tested the impact of several ACO characteristics related to the ACO's management of the waiver. We found that waiver cases at ACOs that reportedly had clinician oversight of all SNF admissions for ACO patients were associated with lower Medicare expenditures, both in terms of expenditures from 30 days before SNF admission through 30 days after SNF discharge and expenditures during the 30 days after SNF discharge. ACOs having a dedicated waiver care coordinator were also associated with lower total Medicare spending for 30 days before SNF admission through 30 days after SNF discharge. Finally, ACOs with previous SNF 3-day waiver experience tended to have higher rates of waiver patients discharged to the community compared to waiver patients at ACOs without prior experience.

SNF 3-DAY WAIVER

Introduction

The skilled nursing facility (SNF) Medicare benefit is intended for beneficiaries requiring short-term skilled nursing or therapy services to manage, observe, and evaluate care after a hospitalization. For Medicare fee-for-service (FFS) beneficiaries, eligibility for SNF Medicare coverage requires a physician to certify the need for daily skilled nursing care and a prior inpatient hospital admission of three or more consecutive days.¹ The hospitalization requirement is referred to as the SNF 3-day rule.

CMS and Congress have acknowledged that there are circumstances under which it may be medically appropriate for some patients to receive SNF care without prior inpatient hospitalization or with a prior inpatient hospitalization lasting fewer than three days.² Recently, CMS has allowed the use of SNF waivers in several demonstrations that test alternative Medicare payment structures. The Pioneer model is an opportune setting for testing the waiver since Pioneer ACOs are strongly motivated to decrease costs while maintaining or improving quality of care and are subject to comprehensive monitoring and evaluation. The waiver of the SNF 3-day rule allows qualified Pioneer ACOs to select the most appropriate care delivery site for their eligible patients, providing an additional lever that ACOs can use to improve care and reduce costs. The Appendix provides background information on the SNF 3-day rule.

In 2013, CMS solicited applications from the Pioneer ACOs to participate in the SNF 3-day rule waiver (referred to in this report as the “SNF 3-day waiver” or “waiver”). Fourteen ACOs applied and were awarded the waiver, which went into effect on April 7, 2014 with 10 ACOs participating.³ Three more ACOs joined later in 2014, with an effective date of July 1, 2014. One other Pioneer, OSF Healthcare, began participating in the waiver in February 2015.

To be granted a waiver, participating ACOs had to demonstrate the capacity and infrastructure to identify and manage their patients admitted to a SNF without a prior three-day hospital stay. They were also required to officially partner with the SNFs to which they would send waiver patients; partnering SNFs could also be participants in the CMS Bundled Payments for Care Improvement (BPCI) Model 3 (starting in January 2015) and must have had a quality rating of three or more stars under the CMS 5-Star Quality Rating System.⁴ For a patient to be eligible for a SNF admission through the waiver, (s)he must have been aligned with a participating ACO, not reside in a SNF or long-term care setting (at the beginning of the episode), and:

¹ Time spent in observation status or in the emergency room prior to (or in lieu of) an inpatient admission to the hospital does not count toward the 3-day qualifying inpatient hospital stay.

² Lipsitz, Lewis A., 2013, “The 3-Night Hospital Stay and Medicare Coverage for Skilled Nursing Care,” *Journal of the American Medical Association*, Vol. 310, No. 14: 1441-2.

³ Four Pioneer ACOs were awarded the waiver but did not implement it because they exited the Pioneer model in 2014.

⁴ Under BPCI Model 3, SNFs may serve as episode initiators: an episode is triggered by a Medicare beneficiary’s acute care hospital stay and begins at initiation of post-acute care services with a participating SNF, inpatient rehabilitation facility, long-term care hospital, or home health agency.

-
- Be medically stable,
 - Have certain and confirmed diagnoses,
 - Not require inpatient hospital evaluation or treatment, and
 - Have an identified skilled nursing or rehabilitation need that cannot be provided by outpatient or home health services.

In this analysis, we used information from the ACOs' waiver applications, site visits, phone interviews with participating ACOs, and data from Medicare claims and the Minimum Data Set 3.0 (MDS) to address three questions:

1. What is the profile of ACOs that applied for and received the waiver?
2. What is the effect of the waiver on patients using SNF?
3. What is the effect of the SNF 3-day waiver on patients without conditioning on SNF use, in other words, did the waiver induce additional SNF use, and if so, what is the overall effect of the waiver on patient outcomes?

To understand participating ACOs' implementation of the waiver, we analyzed their application materials, reviewed the ACO Evaluation team's site visit files, and conducted interviews with the ACOs. We categorized the information into topics and discussed emerging themes. Topics included ACOs' motivations and goals for obtaining the waiver, whether they achieved their goals, description of ACOs' operations, clinical oversight, care transitions, monitoring activities, and barriers to success. These findings are discussed in the section, "Qualitative findings: description of Pioneer ACOs participating in the SNF 3-day waiver."

We used Medicare claims in 2014 and 2015 to identify patients using the SNF 3-day waiver and examined their characteristics using Medicare claims, SNF Minimum Data Set assessment data, and market-level information. We examined a set of outcome measures for the SNF 3-day waiver patients consisting of community discharge from the SNF, improvement in ADL function during the SNF stay, post-SNF acute care and mortality, and total Medicare expenditures. In our main analysis, we compared the outcomes of waiver patients to a comparison group consisting of traditional Medicare FFS SNF patients aligned with participating ACOs who had a prior inpatient hospitalization lasting exactly three days. We controlled for a set of patient, SNF and market-level characteristics. We also conducted a set of sensitivity analyses, which included: (1) implementing a selection model to control for patient selection into SNF use; and (2) defining the comparison group as all traditional Medicare FFS SNF patients aligned with the ACO and comprising the ACO market comparison group used in the broader evaluation (separately). Finally, we conducted subgroup analyses to determine how certain ACO-level characteristics such as whether the ACO had previous waiver experience were associated with the findings.

Qualitative findings: description of Pioneer ACOs participating in the SNF 3-day waiver

In this section, we present information on the ACOs participating in the SNF 3-day waiver. In addition to basic background information on each ACO such as the size, number of aligned beneficiaries, or geographic area, we explore a variety of topics to understand the participating ACOs, how they operated, the challenges they faced, and their experiences with the waiver.

We draw information from a variety of data sources, listed below. The Appendix provides details on the methods used to develop, compile, and analyze these data sources.

- *ACO Evaluation Team documents and data:* We leveraged the considerable amount of data collected and collated by the evaluation team. These data include ACO-specific profiles, quarterly interview notes from nine rounds of interviews, site visit debrief reports, as well as relevant quantitative data from the team’s analytic files.
- *Participating ACOs’ SNF 3-day waiver applications:* CMS provided the evaluation team with the participating ACOs’ application materials. Applications were detailed and generally standardized, allowing for comparison across the Pioneer ACO applicants.
- *Semi-structured telephone interviews:* We spoke with representatives of participating ACOs and asked specific questions regarding their experiences with the SNF 3-day waiver as part of the evaluation team’s final set of quarterly interviews in May-June of 2015. The interview questions focused on information not available from the SNF 3-day waiver applications or information likely to have changed since the ACOs submitted their applications. The interview guide is in the Appendix.

Background characteristics of participating ACOs

Table 1 presents selected descriptive characteristics for each participating ACO. The 14 Pioneer ACOs were diverse in size, structure, and operations. ACOs were generally large, with 9 of the 14 ACOs reporting more than 500 affiliated physicians and 5 of those reporting more than 1,700 physicians. Most of the ACOs (10) were in an urban setting, with 3 in a rural setting, and 1 identified as being in a mixed urban and rural marketplace.⁵ The ACOs in urban settings commonly reported being part of a “competitive” or “highly competitive” marketplace with other ACO hospitals and physician groups in the region. They reported between 2 and 5 other health systems, including a mix of Pioneer, MSSP, or AP MSSP ACOs in their area (not shown). A range of delivery system types were represented among applicant ACOs, with the most prevalent (half of the participating ACOs) being integrated delivery systems (IDS). The last five columns of Table 1 summarize characteristics related to the ACOs’ SNF 3-day waivers, which are further discussed in the sections below. These include the number of SNF partners that ACOs listed in their applications compared with the number of SNF partners reported in the 2015 interview (after approximately a year of operation); ACOs with previous SNF 3-day waiver experience (through Medicare Advantage, for example); and ACOs reporting to have dedicated care coordinators.

⁵ The urban/rural designation was determined using 2003 Rural Urban Commuting Area Codes for the ACOs’ headquarters. This designation was verified with the ACOs during interviews conducted in 2013.

Table 1. Selected Characteristics of ACOs Participating in the SNF 3-Day Waiver

ACO Name	Waiver Award Date	Number of Aligned Beneficiaries (2014)	ACO Type [1]	Number of ACO Physicians	Geographic Setting	Number of Partner SNFs in Waiver Application	Number of Partner SNFs as of June 2015	Experience with SNF 3-day Waivers	Dedicated Waiver Care Coordinator	Physician Oversight of SNF Admissions
Data Source	<i>Evaluation team's analytic files</i>	<i>Evaluation team analytic file</i>	<i>ACO profiles and interviews May – June 2015</i>	<i>ACO provider files, 2014 [2]</i>	<i>ACO profiles [3]</i>	<i>Applications November 2013</i>	<i>Interviews May – June 2015</i>	<i>Applications and interviews</i>	<i>Application November 2013</i>	<i>Application November 2013</i>
Monarch	April 2014	20,754	IPA	316	Urban	2	7	✓		✓
Allina	April 2014	13,143	IDS	595	Urban	4	8			
Michigan Pioneer	April 2014	17,277	Partnership	213	Urban	4	5		✓	
Banner	April 2014	53,716	IDS	2,351	Urban	9	34	✓	✓	✓
MACIPA	April 2014	10,567	IPA	491	Urban	4	4			
OSF Healthcare	Feb. 2015	33,781	IDS	568	Mixed rurality	4	4			
Partners	April 2014	70,828	IDS	782	Urban	48	61			
BIDCO	April 2014	35,923	Partnership	2,708	Urban	23	37	✓	✓	
Beacon	April 2014	19,905	Partnership	215	Rural	5	14	✓	✓	
Trinity	July 2014	9,332	IDS	64	Rural	2	10			
Atrius	April 2014	32,208	Multispecialty group practice	951	Urban	26	36		✓	
Steward	April 2014	64,441	IDS	2,016	Urban	30	60		✓	
Dartmouth-Hitchcock	July 2014	42,641	IDS	1,943	Rural	12	14			
Heritage California	July 2014	85,739	IPA	1,737	Urban	3	3	✓		✓

Notes: [1] IPA = Independent Practice Association, IDS = Integrated Delivery System, “Partnership” = Partnership of hospital system(s) and medical practices; [2] ACO NPI files were merged to the National Plan & Provider Enumeration System (NPES) and the primary specialty of the NPI was used to identify physicians. These counts represent unique TIN-NPI combinations of physicians (excludes non-physician practitioners); [3] ACO profiles were created for each ACO; geographic designation created based on 2003 Rural Urban Commuting Area Codes of the ACOs’ headquarters and then verified using ACO interviews conducted in 2013.

Were the ACOs' expectations in applying for the SNF 3-day waiver met?**ACOs' impetus for participation**

ACOs expressed that their impetus for applying for the waiver was to lower costs and improve quality of care. Many ACOs also stated that they expected the waiver would reduce hospital readmission rates through interdisciplinary care management teams and protocols and anticipated improved care coordination between the SNF and the admitting entity (e.g., acute care facility, ambulatory setting, community provider, emergency department [ED]).

Most ACOs believed the availability of the waiver would help reduce the total cost of care; this factor was explicitly cited in nine of the applications. They stated that allowing care to take place in the most appropriate setting would lead to cost reductions from eliminating or reducing hospital stays preceding SNF admissions. In addition, admitting patients to a less acute setting was proposed as a driver of improving quality of care, a reason explicitly cited by four of the ACOs in their applications. ACOs explained that being able to move patients more quickly out of (or avoid altogether) acute-care facilities could lead to a reduced risk of hospital-related infections and other complications that are prevalent in acute-care settings. One Pioneer further noted that having an opportunity to move Medicare patients out of the hospital improves behavioral and cognitive outcomes in particular, explaining that this population “do(es) not adapt well cognitively in a hospital setting.”

Participating ACOs explained that patients directly admitted to a SNF would be more mobile and more likely to receive timely rehabilitation therapies. For example, two ACOs explained that participation in the waiver would allow patients to have better access to rehabilitative services, as they would be able to access these services “without having to meet inpatient hospital criteria.” One ACO added that gaining experience in managing post-acute care was a motive, while another noted that their participation was in part driven by their “commitment to doing the right thing.” Multiple ACOs noted broadly that they believe the waiver will lead to improved patient satisfaction in their overall care.

Finally, most ACOs stated that they were motivated to participate in the waiver to improve and streamline care coordination, including improving transitions of care between facilities to avoid negative consequences such as medication errors by enforcing stricter protocols for care coordination across sites. One Pioneer ACO specifically noted that the waiver would provide a “vehicle for improved integration and continuity of care” by having their clinicians and staff remain actively involved over the course of the entire SNF episode.

Mostly too early to tell, but some ACOs report expectations met

In their post-implementation interviews conducted in May and June 2015, when asked whether the ACOs believed they were meeting their expectations for the waiver, four ACOs reported that there was evidence their expectations were being met. The remaining ACOs reporting that they were unable at the time of interview to determine whether the waiver appeared to meet their expectations.

Three Pioneers indicated that they were seeing a decline in readmissions, and three Pioneers reported notable decreases in inpatient length of stay and, for two of them, declines in readmissions. Improvements in efficiency and reductions in costs were also reported by two ACOs, with one reporting a specified dollar amount of \$308,000 in overall savings.⁶ In addition, one Pioneer also reported that it was seeing smoother transitions and patients were “immediately getting the appropriate level of care.” Another Pioneer noted that it had seen a substantial decline in ED admission rates after SNF stays.

Relationships between ACOs and SNF partners

Table 1 shows that all participating ACOs have partnered with at least as many SNFs as they indicated in their applications, with most ACOs partnering with considerably more. Banner, Beacon, and Steward more than doubled the total number of partner SNFs between the time of the application and interview during May-June of 2015.

The ACOs reported having established relationships with SNFs in their market prior to implementing the waiver. Although one Pioneer’s application noted that it had no prior relationship with a SNF, representatives stated in its post-implementation interview that they inventoried SNFs with which they already had partnerships and approached them individually to solicit their interest in being part of the waiver. They found considerable interest among these SNFs because the SNFs believed the waiver would increase their patient volume.

Two Pioneers reported that they had always worked closely with their preferred SNF partners, experiencing a strong relationship prior to the waiver. One of the two Pioneers expanded by saying that the waiver has helped spur an even closer collaboration with their SNF partners. Based on their applications, the types of relationships that Pioneer ACOs had with SNFs prior to waiver implementation ranged from ownership, to contractual agreements, to simply preferred referrals.

Five of the Pioneer ACOs had experience with the SNF 3-day waiver from providing care to patients who were enrolled in Medicare Advantage or other payers with waivers. Many ACOs reported that their existing SNF relationships and care coordination protocols would allow them to seamlessly transition to SNF 3-day waiver implementation for FFS Medicare patients, even when they lacked experience with a waiver.

Most ACOs did not report a change in their degree of collaboration with their SNF partners, although some believed their relationships with SNFs had improved overall. One Pioneer even went as far as saying that their relationships with SNFs have improved overall because the collaboration increased communication between the ACO and its SNFs and solidified workflows via the waiver process:

The program has enhanced our relationships with the SNFs, with clearer expectations, adjustments, and processes. . . . The SNFs are demonstrating that they are caring for the ACO patients as the ACO hopes [and] taking on new initiatives. The waiver has

⁶ The exact period over which these savings were realized or how they were calculated was not specified.

worked well, and it has the added benefit of enhancing the ACO's partnerships with the SNFs.

Criteria for selecting SNF partners

In addition to the CMS requirement of a 3-star overall quality rating for partner SNFs, ACOs considered other criteria (although they were not necessarily required) when selecting SNFs:

- Sufficient patient volume to sustain waiver participation
- The ability to accommodate rapid admissions and work with the ACO on discharge planning
- ACO-contracted physicians are also affiliated with the SNF (i.e., SNFs had existing affiliations with one or more ACO physicians)
- Adequate staffing and supervision levels according to the ACOs
- Presence of an American Medical Director's Association (AMDA) certified Medical Director
- Ability to accept patients evenings and weekends and to begin therapies and treatments promptly
- Clinical coverage and availability of subspecialties
- The presence of quality improvement programs (e.g., routine standards of care meetings, resident council meetings, interdisciplinary meetings; performance scorecards; programs to reduce or eliminate the use of anti-psychotic medications)
- The presence of post-transition support (e.g. set up physician appointment within seven days of discharge, follow-up calls, coordination with SNF Nurse Care Manager)
- Willingness to work closely with the ACO
- Experience accepting direct admit patients
- Presence of a Medicare Advantage contract
- A minimum score on state-specific standards

Implementation of the SNF 3-Day waiver based largely on existing care protocols

Pioneers indicated that their proposed plan for implementation was based on a combination of prior, similar experience with their partner SNFs; processes for care coordination embedded in their admission and discharge processes; and clear quality assurance steps. Many ACOs cited this experience as the basis for developing their protocols for transitioning eligible Medicare patients

directly to the SNF. Established processes of care coordination across settings, including communication protocols with patients' primary care physicians and ACO care coordinators were common across participating ACOs. These Pioneers explained that processes of admission and discharge, data exchange and care assessment, and quality assurance verification steps were ingrained into their ACO processes of care; therefore, direct SNF admission would be a natural extension of existing programs and processes.

SNF 3-day waiver patient eligibility requirements

Overall, waiver recipients described similar basic criteria for patient eligibility for the waiver—that is, patients had to meet the CMS standard for waiver eligibility listed in the introduction. In addition, one ACO noted that it reviewed patient histories to assess risk before direct admission, but most used a standard set of care delivery criteria to assess the appropriateness of waiver admission:

- Patient did not require active management by a provider;
- Patient did not present with a new complex chronic condition;
- Patient had no unresolved complex social/behavioral issues and did not have the ability or resources to support him- or herself medically at home or in an assisted living facility;
- Patient did not require infusions (i.e., the SNF is able to insert intra-venous lines or the line has been inserted prior to admission); and
- Patient was not in hospice or not regarded to be at high risk of death.

Composition and responsibilities of the care team for SNF 3-day waiver-eligible patients

The composition of care teams responsible for waiver-eligible patients varied in breadth and depth across the participating Pioneer ACOs but always included a care coordinator or care manager (usually a social worker or nurse) serving as the linchpin of the staffing structure. The care coordinator manages other staff and is responsible for making decisions and transferring data across care delivery sites. Almost all ACOs noted that this staff person also oversaw care transitions into and out of the SNF. However, whether the care coordinator was dedicated to waiver patients and whether the ACO care coordinator was hospital-based, community-based, or centralized varied across participating Pioneer ACOs. The care coordinator's role was also dependent on the ACO's organization and how staff worked across sites of care.

The participating ACOs explained that ACO care coordinators or care managers oversaw the waiver overall, including collecting data and liaising with staff based at sites of care. Some ACOs had centralized care coordinators/managers who oversaw all patients across multiple care delivery sites, including waiver patients. This model mimics a wheel where the care coordinators/managers work from a hub to coordinate care at various delivery sites, which are the spokes of the wheel. This approach was especially true for ACOs that owned their SNFs or had integrated health systems where care coordinators worked across the organization. Among ACOs that were not vertically integrated with SNFs and other providers on the care continuum, a common

configuration for oversight of waiver patients was a multi-site, multi-staff structure whereby SNF-based care coordinators liaised with an ACO-appointed care manager either based in the hospital or centrally located. In this model, the care coordinators were not centrally located; rather, they were scattered across care delivery sites.

Typically, care coordinators/managers were not dedicated solely to overseeing waiver patients; rather, waiver patients were one subset of the population whose SNF admission and discharge decisions they monitored. In some cases, they also coordinated with patients' primary care physicians post-discharge. However, in several cases, ACOs identified at least one dedicated care coordinator for the waiver (shown in Table 1). Two Pioneers reported using a liaison to work with the SNFs to assess whether the waiver may be appropriate for a patient.

In their post-implementation interview, only one Pioneer described a robust waiver administrative oversight structure: “[We had a] program director and administrator [of the waiver], a SNF oversight committee and nurse leads for each of the sites to review data and to discuss how the waiver should be used, and discuss case studies and best practices.” However, they also noted that they did not have dedicated SNF 3-day waiver clinical staff and that each site configured oversight slightly differently, depending on labor capacity, opportunity, and organizational structure (e.g., physician-only or a physician-hospital organization).

Clinical oversight of the care team for SNF 3-day waiver-eligible patients

SNF core clinical teams often included physician/nurse practitioners (NPs), registered nurses (RNs) and certified nursing assistants (CNAs), a director of nursing, and care management staff. Generally, the care management staff consisted of one or a combination of case/care managers and care coaches, who were usually RN/licensed practical nurses and bachelor-level staff, respectively. Other allied professional groups such as social work, physical and occupational therapy, speech/language pathology, and pharmacy and specialist physicians, were described as being on-call or part of the extended team reviewing patient cases periodically. For example, one Pioneer had a speech/language pathologist who regularly rounded in all ACO-affiliated SNFs.

Generally, physicians were not part of the core SNF care team, but some ACOs reported that they had a physician who directly oversaw SNF admissions from an acute care hospital, an ED, or from the community (shown in Table 1). For example, hospital physicians coordinated with providers at the admitting SNF to determine eligibility and coordinate care. One ACO noted that physician medical directors were present in regular team meetings with staff “to ensure appropriate care is rendered.”

Finally, two ACOs described having home health nursing staff, transition specialists, and illness management nurses as part of their care team. These specialists assessed patients either during or after admission, sometimes were invited to discharge meetings, and continued to work with patients post-discharge.

Care transitions to SNFs and workflows under the 3-day waiver

ACO care coordinators/managers generally managed transitions between settings. In some cases other staff members, including providers and social workers, were actively involved in the care

transition team. For example, at one Pioneer, an associate medical director, a behavioral health specialist, a pharmacist, and other specialized providers worked with the care management staff as part of an interdisciplinary team overseeing the SNF transfer. They worked together to develop the care plan in the SNF and beyond. Across most ACOs, a designated staff member was responsible for most of the following tasks:

- Reviewing and documenting the patient waiver eligibility plan; creating or adding to the plan of care and goals for patient transfer.
- Informing the patient and their families/caregivers of eligibility for early transfer; educating them about the plan and obtaining approval for the early transfer.
- Ensuring clear communication with ACO staff at sites of care across the continuum (i.e., hospital, SNF, home health, and the PCP or care manager) to describe and document the patient diagnosis, skilled needs, goals for improvement, and medication and diagnostic results (e.g., labs).
- Reconciling medications, obtaining durable medical equipment, home care, or other outpatient services.
- Alerting the patient's PCP upon SNF discharge.
- For some sites that had a shared EMR across sites of care as part of the ACO, updating the patient's electronic record and updating the eligibility/admission criteria during care transitions.

In post-implementation interviews, ACOs described in more detail what systems they used to manage workflows and communicate across settings. ACOs largely described using workflows already in place under the Pioneer model to support care transitions across the continuum. Some Pioneer ACOs may not have felt the need to designate care coordination staff for SNF waiver transitions since they already had some form of care management system in place that could be extended to SNF waiver patients. However, some ACOs indicated that the waiver encouraged ACOs to further develop their communication infrastructure, namely dedicating additional staff to oversee the waiver.

ACOs reported increased electronic data sharing and improved communication among staff across sites of care, including SNF staff. Most ACOs had been using an electronic communication tool (an EMR or a stand-alone electronic tool such as Patient Ping⁷ or INTERACT⁸) to share patient data across settings prior to the waiver, but the extent of data sharing and the degree of analytic capacity increased in some cases. For example, six Pioneers described increased use of electronic data sharing and timelier follow up with patients post-SNF discharge. In these ACOs, workflows had been put into place to enter patient data sooner and more robustly, to comply with reporting requirements to CMS, and to move referrals along more quickly. Two of these Pioneers also

⁷ <http://www.patientping.com/>

⁸ <https://interact2.net/>

described in their post-implementation interviews that provider education around the waiver workflow has made the process increasingly smooth over time.

ACO self-monitoring under the SNF 3-day waiver

All of the ACOs with waivers proposed plans in their applications for tracking waiver cases and for self-monitoring quality, safety, and patient experience. However, there was wide variability in the scope of self-monitoring activities. The scope of their plans ranged from weekly meetings to review SNF cases, to monthly or quarterly meetings to monitor trends and patterns of patient events, and to tracking specific measures, including quality measures reported on Nursing Home Compare, medication reconciliation, readmission rates, post-discharge follow-up appointments, referrals to home health, and other measures. Many ACOs reported that they tracked and reported on these measures on a monthly or quarterly basis.

Challenges and barriers to achieving SNF 3-day waiver goals

Participating ACOs felt that one of the greatest challenges to their success was a smaller-than-anticipated volume of waiver patients. ACOs reported several factors that limited patient volume:

- Obtaining hospital buy-in because of competing interests between the objectives of the waiver and hospitals. One goal of the waiver is to keep people out of the hospital (when appropriate), whereas the goal of the hospitals is to fill beds. From a business standpoint, hospitals with empty beds are less likely to use the waiver.
- A physician may refuse to certify that a patient is well enough to transition to a SNF under the waiver (fewer than 3 inpatient days) for fear of liability if the patient's condition deteriorates.
- The amount of time needed to disseminate information about and garner interest in the waiver. Informing hospital and SNF staff about the waiver involves extensive education, workload development, and training that took more time than anticipated.
- Complexity of real-time patient identification. Patient preferences and competing programs complicate the decision of where to transition patients. Patients often prefer to be transferred to a SNF close to their home, which may not be partnered with the ACO. Further, busy staff at hospitals implementing multiple, similar programs may be confused about where to transfer patients.
- Identifying ACO staff with appropriate skills to operationalize the waiver has been a challenge for at least one ACO.

ACOs generally felt that the requirement that nursing homes have at least a 3-star overall rating from the 5-Star Quality Rating System for SNFs was problematic, and reported that ineligible SNFs objected to being excluded. ACOs noted that BPCI Model 2 patients have more flexibility since BPCI Model 2 participants only need a majority of their partnered SNFs to be 3 Stars.

The requirement for SNFs to accept direct, off-hour admissions including on weekends and holidays was a challenge mentioned by at least one ACO. Prior to the waiver, they had not accepted off-hour direct admissions so they were not properly staffed for it. Also, observation stays often occur on weekends and holidays when the case manager overseeing direct SNF admissions is not working. Because the case manager needs to approve SNF admissions, the process can be delayed. The ACO that mentioned this challenge was working on distributing the approval authority to others during off-hours to take the burden off the case manager.

Software issues and delays in receiving eligibility data created barriers to achieving waiver goals. One Pioneer reported that software glitches caused a delay in processing invoices, which negatively affected their relationship with partner SNFs. Another Pioneer built a separate application to identify ACO patients for the waiver, but lags in the availability of eligibility data led to uncertainty in the timeliness and accuracy of the data. This data limitation limited adoption of the waiver, and the Pioneer ACO noted that both its internal system and data transmission from CMS needed improvement.

Quantitative findings: effect of the SNF 3-day waiver on patient outcomes

In this section we provide findings from using the Medicare claims and Minimum Data Set 3.0 to examine the effect of the waiver on a set of beneficiary outcomes. We first describe the number and characteristics of patients identified as SNF 3-day waiver patients through 2015. We then compare SNF 3-day waiver patients to a group of SNF patients who did not use the waiver to assess the effect of the waiver conditional on SNF use. Next, because the waiver may induce use of SNF waiver admissions among patients who otherwise would not have been admitted to a SNF, we specify a sample selection model to obtain and estimate the effect of the SNF waiver in Pioneer ACOs “unconditional” on the fact that the patients we had observed had used the SNF. We conduct sensitivity tests by using different definitions of the comparison groups and examine impacts by subgroups identified from the qualitative data collection.

Counts of SNF 3-day waiver patients

Table 2 shows the number of SNF 3-day waiver admissions broken down by direct versus fewer than 3-day waiver patients. Counts were determined using a claims-based methodology described in the Appendix. Overall, we identified 4,301 SNF 3-day waiver stays across the 21 months. In Table 2 and throughout the analysis, we separated waiver stays into two distinct, non-overlapping groups: (1) “direct” entry to the SNF, meaning the patient did not have a hospitalization the day of, or the day before, SNF admission;⁹ and (2) “fewer than 3-day” entry into the SNF, meaning the patient did have a prior inpatient hospitalization the day of or the day before entry into SNF, but the hospitalization was fewer than 3 days in length. This distinction is meaningful because patients who bypass hospital admission entirely may be quite different from patients who were admitted to

⁹ SNF waiver stays preceded by hospital stays of less than 3 days occurring within 30 days of SNF admission were treated as “direct” SNF admissions as long as the hospital admission did not occur the same day of or the day before the SNF admission. In all cases, if a hospitalization lasting for 3 days or more occurred any time within 30 days prior to a SNF admission, the SNF admission was not counted as a waiver stay.

the hospital but deemed by the ACO as more appropriately served by a SNF before the third day, when Medicare would traditionally start covering eligible SNF care.

As shown in Table 2, 76 percent of the 4,301 waiver stays were direct. Across ACOs, the percentage of direct admissions ranged from a low of 53 percent for OSF Healthcare (which participated in the waiver in 2015 only) to 87 percent for BIDCO.

Table 9 (in the Appendix) shows the breakdown of waiver stays between the start of ACO participation and December 31, 2015. The number of waiver stays increased from 1,301 stays in 2014 to 3,000 stays in 2015.

Table 2. Counts of SNF 3-Day Waiver Stays by ACO, 2014-2015

ACO Name	Direct	Fewer than 3-Day	Total	% Direct
Monarch Healthcare	87	73	160	54.4%
Allina Health	48	23	71	67.6%
Michigan Pioneer ACO	7	4	11	63.6%
Banner Health Network	708	220	928	76.3%
Mount Auburn Cambridge Independent Practice Association (MACIPA)	51	22	73	69.9%
OSF Healthcare	57	50	107	53.3%
Partners HealthCare	483	93	576	83.9%
Beth Israel Deaconess Care Organization (BIDCO)	535	83	618	86.6%
Beacon Health	227	77	304	74.7%
Trinity Pioneer ACO	113	40	153	73.9%
Atrius Health	255	58	313	81.5%
Steward Health Care System	544	225	769	70.7%
Dartmouth-Hitchcock	155	54	209	74.2%
Heritage California ACO	6	3	9	66.7%
Total	3,276	1,025	4,301	76.2%

Note: SNF 3-way waiver stays were identified using Medicare claims data from the start of ACO participation through December 2015.

Characteristics of SNF 3-day waiver patients

Table 3 provides the characteristics of SNF 3-day waiver patients. Characteristics are shown for all waiver cases and separately for direct and fewer than 3-day waiver stays. The Appendix describes the data sources used. Statistically significant differences ($p < 0.05$) between direct and fewer than 3-day waivers are also shown.

Overall, waiver patients were mostly female (70 percent), white (94 percent), and generally older – 48 percent were 85 years or older, 32 percent were 75-84 years, and 19.6 percent were less than

75 years.¹⁰ Approximately 30 percent were married and 16 percent were dually eligible for Medicaid and Medicare. Just over one-third (36 percent) of waiver patients had at least one hospitalization in the prior calendar year (before their use of the waiver). On average, waiver patients had three Medicare covered days of hospitalization, 6.8 covered days in a SNF, and 1.1 inpatient or outpatient visits to an emergency department (ED) in the prior calendar year.

In terms of outcomes of SNF 3-day waiver stays, the average length of stay in the SNF for waiver patients was 20.9 days.¹¹ Eighty percent of waiver patients were discharged from the SNF to the community; 91.2 percent of patients had improved or had the same overall functional status from SNF admission to discharge, as measured by a long-form Activities of Daily Living (ADL) score. After waiver patients were admitted to the SNF, 5.6 percent had an inpatient or outpatient ED visit within seven days and 4.3 percent were hospitalized within seven days. Within 30 days of SNF admission, 18.8 percent had had an ED visit, and 13.6 percent were hospitalized. Within 30 days of SNF discharge, 5.9 percent of waiver patients had died.

Direct and fewer than 3-day waiver patients appeared to be very similar with respect to demographic characteristics, health, prior medical use, and outcomes, including Medicare expenditures. There were few statistically significant differences ($p < 0.05$) in the variables' means between the two groups. Fewer than 3-day waiver patients were somewhat younger than direct waiver patients (44.4 percent were older than 84 years, versus 49.5 percent of direct waivers). Fewer than 3-day patients had slightly fewer ED visits in the prior calendar year (1.0 versus 1.1 visits). The percent of direct waiver patients with an ED visit within seven days before SNF admission (67 percent) was higher than among other waiver patients (10 percent). Similarly, observation service use in the seven days prior to SNF admission was higher among direct waiver patients (18 percent) compared to other waiver patients (0.8 percent). Thus, a majority of direct waiver stays were entering SNF from the ED or from observation.

We calculated two expenditure variables. The first spanned the period 30 days prior to SNF admission through 30 days after SNF discharge, regardless of length of stay in the SNF. The prior month to SNF admission is of interest for capturing the differences in expenditures resulting from a fewer than 3-day or no prior qualifying hospitalization. Not surprising, patients with a fewer than 3-day prior inpatient hospitalization spend more on average than direct waiver patients (\$29,249 versus \$23,752). A second expenditure measure covered the expenditures incurred during the 30-day period following SNF discharge. These expenditures were slightly lower for fewer than 3-day patients compared with direct patients (\$4,920 versus \$5,174), but this difference was not statistically significant.

Table 10 in the Appendix provides additional beneficiary characteristics, such as functionality from the MDS as well as SNF facility characteristics. Relative to patients with a fewer than 3-day prior inpatient hospitalization, direct waiver patients had higher shares of cognitive status impairment, urinary incontinence, bowel incontinence, and presence of pain upon admission to the SNF. Fewer than 3-day waiver patients had higher levels of motion impairment. Direct waiver patients were also somewhat worse off with respect to activities of daily living, as reflected by

¹⁰ Not based on unique patients; however, the majority of patients only used the waiver once. Of the 4,301 patients, only 199 (5 percent) used the waiver twice during the evaluation period.

¹¹ Medicare beneficiaries are required to start paying daily coinsurance after day 20 of a SNF stay.

higher average activities of daily living (ADL) scores for overall, self-care (“mid-loss”), and mobility (“early-loss”) functioning.

Table 3. Selected Descriptive Characteristics of SNF Waiver Patients, 2014-2015

Characteristics	All Waiver Patients [1]	Direct	Fewer than 3-Day
	Mean / %	Mean / %	Mean / %
Patient Demographics			
Female	69.9%	69.9%	70.1%
Age: <65	4.2%	4.0%	4.8%
Age: 65-74	15.4%	15.1%	16.4%
Age: 75-84	32.1%	31.3%	34.4%
Age: >84	48.3%	49.5%	44.4%
Race: White (Non-Hispanic)	94.0%	94.0%	94.1%
Race: Black	2.4%	2.6%	2.0%
Race: Asian/Pacific Islander	0.9%	0.9%	0.8%
Race: Hispanic	1.9%	1.7%	2.3%
Race: Other	0.8%	0.9%	0.8%
Married	32.9%	33.6%	30.6%
Medicaid dual eligibility	15.9%	16.1%	15.0%
Health and Prior Medical Use			
HCC risk score [3]	1.93	1.94	1.88
Total Medicare expenditures during prior year	\$22,800	\$22,948	\$22,329
Any hospitalization during prior year	36.2%	36.1%	36.6%
Number of covered days of hospitalization in prior year	3.0	2.9	3.0
Number of covered days of SNF in prior year	6.8	6.8	6.9
Number of ED visits in prior year	1.1	1.1	1.0
Preceding ED visit in 7 days prior to SNF admission	53.7%	67.3%	10.2%
Preceding observation service in 7 days prior to SNF admission	14.2%	18.4%	0.8%
Outcomes			
Improved/Same activities of daily living score at SNF discharge	91.2%	91.0%	91.7%
Length of SNF stay (days)	20.9	21.1	20.3
Discharged from SNF to community	80.2%	80.2%	80.3%
Patients with any ED visit in the 7 days following SNF discharge [4]	5.6%	5.7%	5.4%
Patients with any ED visit in the 30 days following SNF discharge [4]	18.8%	18.9%	18.4%
Patients with a hospitalization in the 7 days following SNF discharge	4.3%	4.0%	5.4%
Patients with a hospitalization in the 30 days following SNF discharge	13.6%	13.3%	14.7%

Characteristics	All Waiver Patients [1]	Direct	Fewer than 3-Day
	Mean / %	Mean / %	Mean / %
Patients with mortality within 30 days following SNF discharge	5.9%	5.5%	7.1%
Total Medicare expenditures: 30 days prior to SNF admission through 30 days after SNF discharge	\$25,062	\$23,752	\$29,249
Total Medicare expenditures: during 30 days after SNF discharge	\$5,114	\$5,174	\$4,920

Notes: [1] There were 4,301 all waiver patients, including 3,276 direct waivers and 1,025 fewer than 3-day waivers.

[2] Using 3-tests, statistically significant differences ($p < 0.05$) between direct and fewer than 3-day patients compared with all waiver patients in bold.

[3] The Hierarchical Condition Category (HCC) score is a function of beneficiary chronic conditions, gender, and institutional status from the year immediately prior to the performance year and serves as a proxy for relative illness to identify the highest projected spenders.

[4] Emergency department (ED) visits are inclusive of all ED visits, whether or not the patient was subsequently admitted as an inpatient.

Evaluation methodology

To determine the effect of the waiver on the outcomes of interest (listed in the bottom panel of Table 3), we compared waiver patients to non-waiver SNF patients. Our main model used a multivariate regression that controlled for beneficiary and SNF characteristics listed in Table 3 and Table 10 (in the Appendix). The Appendix also provides more detail on methodology and the data sources used. In this section, we describe the composition of the non-waiver patient comparison groups, the methods used to measure the overall effect of the waiver (accounting for the possibility that the availability of the waiver may have induced some beneficiaries to use SNF who otherwise would not have), and subgroup analyses performed.

Comparison groups

The main comparison group we used to measure the impact of the waiver consisted of patients aligned with participating Pioneer ACOs with a non-waiver, Medicare-covered SNF stay at an eligible (partner) SNF preceded by a hospitalization *exactly* three days in length, which is referred to as our “restricted” comparison group. The second comparison group we used was beneficiaries aligned with Pioneer ACOs with a non-waiver, Medicare-covered SNF stay preceded by a hospitalization of *more* than three days. We refer to this latter comparison group below as our “unrestricted” comparison group. An advantage of both of these comparison groups is that they face the same market, ACO, and SNF conditions as the waiver patients. The disadvantage is that the reasons these patients did not use the waiver – such as ineligibility or patient preference – may not be random, which would confound the results if not properly controlled for. A third comparison group comprising alignment-eligible beneficiaries located within the ACO’s market and not attributed to any Medicare ACO but with traditional SNF stays at ACO partner SNFs and a prior inpatient hospitalization lasting exactly three days.¹² While this group avoids confounding from the selection of patients who used the waiver, a disadvantage of this group is our inability to

¹² The ACO market comparison group consisted of alignment-eligible beneficiaries residing in the same ZIP codes as at least 1 percent of aligned beneficiaries.

disentangle the effect of the waiver from the effect of being aligned with an ACO. Another disadvantage is that ACO market data is not defined for 2015 since ACO markets were defined through the third Pioneer ACO performance year (2014).

Effects of the waiver unconditional of SNF use

When using a comparison group consisting of only patients who had SNF stays, we are making an assumption that in the absence of the waiver, these patients would have had Medicare-covered SNF stays (and incurred the requisite prior inpatient hospitalization). A major challenge to evaluating the impact of the waiver is accounting for the effect of the waiver on inducing SNF use among patients who may not necessarily have otherwise had a Medicare-covered SNF stay. In the absence of the waiver, a patient may have otherwise self-paid for SNF services (not observable in the data), sought alternative care, or gone without care. It is difficult to model this counterfactual world.

One possibility we explored was using a selection model that jointly estimates the probability of a SNF stay and the effect of the waiver on outcomes conditional on the SNF stay. This approach provides the unconditional effect of the waiver in the sense that it accounts for a patient's predicted probability of SNF use based on a set of patient and market-level characteristics. This method does not explicitly provide measurement of the existence (or extent) of increased SNF use directly attributable to the waiver. However, we do use estimates from the selection model to compare the average predicted probability of a SNF stay between waiver patients and comparison patients who were admitted to a SNF. If the waiver tended to induce patients to use a SNF when they would not have otherwise, then we would expect to find that, based on observed characteristics, waiver patients had a *lower* predicted probability of SNF admission relative to comparison patients who had a SNF stay. The Appendix provides a more detailed description of the multivariate regressions and selection model used.

Subgroup analyses

From the qualitative data analyses, several ACO-level variables of interest were quantifiable. These included:

- Experience with SNF 3-day waiver: 5 ACOs indicated having prior experience with the SNF 3-day waiver through their Medicare Advantage and other private plan patients.
- Dedicated Waiver Care Coordinator: 6 ACOs reported having a particular staff member dedicated to the waiver.
- Physician Oversight of SNF Admissions: 3 ACOs reported having clinician oversight of all SNF admissions, including those through the waiver.

We examined whether the impact of the SNF 3-day waiver differed between patients of ACOs with these selected features and without these selected features. This approach was conducted by re-estimating the multivariate regressions and interacting the waiver indicators with indicators for these features.

Results

Table 4 below compares the characteristics of the waiver patients to the main comparison group (non-waiver, ACO-aligned patients who had an exactly 3-day inpatient hospitalization prior to partner SNF admission). The table also includes an alternate comparison group similar to the main comparison group, but without restricting the prior inpatient hospitalization to be exactly three days (referred to as the unrestricted comparison). Statistically significant differences between the comparison groups and the waiver group at the 5 percent level are indicated by an asterisk.

There were several statistically significant differences between waiver patients and the main comparison group patients with respect to the variables included in the risk-adjustment models. In terms of demographic characteristics, the two groups were equally likely to be female but waiver patients were generally older (48.3 percent were older than 84 years, versus 38.7 percent of comparison patients). Waiver patients were somewhat more likely to be white, less likely to be black, and more likely to be married. Waiver patients were generally less healthy than the main comparison group. In the prior calendar year, they had higher HCC risk scores (1.93 versus 1.72), higher Medicare spending (\$22,800 versus \$20,873), more Medicare covered days in a hospital (3.0 versus 2.4 days), more covered days in a SNF (6.8 versus 5.8 days), and more outpatient ED visits (1.1 versus 0.8 visits). Since comparison patients had a qualifying inpatient stay prior to SNF admission and direct waiver patients tended to enter the SNF from the ED or from observation, waiver patients were much more likely to have an ED visit or observation stay in the seven days before SNF admission.

Table 11 (in the Appendix) shows additional comparisons on MDS variables that describe patients' functional status at SNF admission and characteristics of the SNFs. Across most of the MDS variables, waiver patients fared the same or worse than the comparison group. There were also statistically significant differences between waiver patients and the comparison group in terms of the RUG-IV case-mix classification system, but no clear pattern emerged with regard to higher versus lower levels of nursing and rehabilitation therapy. While both groups consist of patients admitted potentially to the same set of waiver-eligible SNFs, there were statistically significant differences in the types of facilities that waiver and comparison patients tended to use. A greater share of waiver patients were admitted to 4-Star SNF facilities, and a greater share of comparison patients were admitted to 5-Star facilities (using December 2014 Star ratings from Nursing Home Compare). The average number of deficiencies on the facility's most recent inspection (as of December 2014) was somewhat higher for waiver patients. Waiver patients were more likely than comparison patients to be admitted to mid-size facilities (50-99 beds) or the largest facilities (200 or more beds), and less likely to be admitted to the smallest facilities (<50 beds) or facilities with 100-199 beds. Waiver patients were also more likely to be admitted to hospital-based facilities, facilities under chain ownership, and non-government run facilities.

Without risk-adjusting the comparisons of patient outcomes, waiver patients (who tended to be less healthy than the comparison patients) appeared to also fare worse than main comparison patients (bottom panel of Table 4). Waiver patients were significantly more likely to have an ED visit in the 7 days following SNF discharge (5.6 versus 4.2 percent) or 30 days following SNF discharge (18.8 versus 14.9 percent). They were significantly more likely to be hospitalized in the 7 days (4.3 versus 3.3 percent) or 30 days (13.6 versus 11.6 percent) following SNF discharge.

The share of waiver patients that maintained or improved their overall ADL function upon SNF discharge was smaller than for comparison patients (91.2 versus 92.7 percent, $p < 0.05$).¹³ Average Medicare spending between the 30 days prior to SNF admission and 30 days after SNF discharge was significantly lower for waiver patients (\$25,062 versus \$32,180), likely reflecting the qualifying 3-day inpatient hospital stay required for the main comparison group, since total Medicare expenditures in the 30 days after SNF discharge were approximately \$5,000 for both groups and both groups had an average length of stay in the SNF of approximately 21 days.

Despite observed differences in underlying health, baseline function, and prior utilization measures, the main comparison group had fewer significant differences with waiver patients on observable characteristics than the unrestricted comparison group, which did not restrict preceding hospital stays to exactly three days. Thus, the main comparison group is also likely to be closer aligned with the waiver patients on unobservable characteristics. Patients in the unrestricted group were significantly less likely than waiver patients to be female (65.1 percent) and more likely to be dually eligible (19.7 percent). Differences in age, race, and marital status were also statistically significant and larger than the differences between waiver patients and the main comparison group. As expected, waiver patients tended to be in better underlying health than this unrestricted comparison group. Waiver patients had similar HCC risk scores, and the number of Medicare-covered days in a SNF in the prior year was not significantly different. Waiver patients still had more outpatient ED visits (1.1 visits versus 0.9 visits). However, other statistically significant differences included lower Medicare expenditures (\$22,800 versus \$24,499), a lower likelihood of hospitalization (36.2 percent versus 38.5 percent), and fewer covered days in a hospital (3.0 days versus 3.3 days) in the prior year. Waiver patients were also more likely than the unrestricted comparison group to have had an ED visit or an observation stay in the seven days before admission to the SNF.

In Table 11 (see Appendix), waiver patients fared the same or better than the unrestricted comparison group with respect to the MDS variables that describe patient functional status at SNF admission. As with the main comparison group, there were statistically significant differences between waiver patients and the unrestricted comparison groups in terms of the RUG-IV case-mix classification system. The differences between the characteristics of the SNFs used by waiver patients and the unrestricted comparison group were similar to the differences noted with the main comparison group.

Differences in outcomes between waiver patients and the unrestricted comparison group were consistent with comparisons showing waiver patients to be somewhat healthier. Compared to waiver patients, the unrestricted comparison group had higher rates of ED visits in the 7 days (7.0 percent) or 30 days (21.0 percent) following SNF discharge, and hospitalizations in the 7 days (5.6

¹³ Overall ADL function is measured on the 5-day PPS MDS assessment and the discharge MDS assessment using an index calculated using seven ADL items and ranging from a score of 0 (completely independent) to 28 (completely dependent). A negative change in the score from admission to discharge indicates improvement. The days between admission and discharge from the SNF varied across patients. The average change was -2.22 (SD=0.06) among waiver patients and -2.51 (SD=0.06) among patients in the main comparison group. This difference was statistically significant at the 5 percent level ($p=0.015$). The average change was -2.23 (SD=0.03) among patients in the unrestricted comparison group, which was not significantly different from waiver patients ($p=0.124$).

percent) or 30 days (17.7 percent) following SNF discharge. They stayed more days in the SNF (22.1 days), had lower rates of community discharge (72.0 percent), and a higher 30-day mortality rate following SNF discharge (9.7 percent). The unrestricted comparison group also had higher Medicare spending; whether in the period spanning 30 days before and after the SNF stay (\$39,433) or in only the 30 days after SNF discharge (\$6,573). All these differences are statistically significant at the 5 percent level.

Table 4. Selected Descriptive Characteristics of SNF Waiver and Comparison Patients, 2014-2015

Characteristics	Waiver [1]	Preceding Hospitalization Was 3 Days (Main Comparison) [3]	Preceding Hospitalization Was >3 Days (Unrestricted Comparison) [3]
	Mean / %	Mean / %	Mean / %
Patient Demographics			
Female	69.9%	70.0%	65.1%
Age: <65	4.2%	4.4%	5.2%
Age: 65-74	15.4%	21.9%	19.6%
Age: 75-84	32.1%	35.0%	35.0%
Age: >84	48.3%	38.7%	40.2%
Race: White (Non-Hispanic)	94.0%	93.0%	92.6%
Race: Black	2.4%	3.1%	3.4%
Race: Asian/Pacific Islander	0.9%	0.9%	0.8%
Race: Hispanic	1.9%	2.4%	2.3%
Race: Other	0.8%	0.6%	0.9%
Married	32.9%	35.3%	35.5%
Medicaid dual-eligible	15.9%	16.9%	19.7%
Health and Prior Medical Use			
HCC community score in prior calendar year [2]	1.93	1.72	1.98
Total Medicare expenditures during prior calendar year	\$22,800	\$20,873	\$24,499
Any hospitalization during prior calendar year	36.2%	34.6%	38.5%
Number of covered days of hospitalization in prior calendar year	3.0	2.4	3.3
Number of covered days of SNF in prior calendar year	6.8	5.8	6.6
Number of outpatient ED visits in prior calendar year	1.1	0.8	0.9

Characteristics	Waiver [1]	Preceding Hospitalization Was 3 Days (Main Comparison) [3]	Preceding Hospitalization Was >3 Days (Unrestricted Comparison) [3]
	Mean / %	Mean / %	Mean / %
Percent of patients with preceding ED visit (last 7 days)	53.7%	8.5%	6.9%
Percent of patients with preceding observation service (last 7 days)	14.2%	0.5%	0.4%
Outcomes			
Percent of patients with improved/same ADL score at SNF discharge [4]	91.2%	92.7%	91.5%
Length of SNF stay (days)	20.9	20.7	22.1
Percent of patients discharged from SNF to community [4]	80.2%	80.8%	72.0%
Percent of patients with any ED visit in the 7 days following SNF discharge [5]	5.6%	4.2%	7.0%
Percent of patients with any ED visit in the 30 days following SNF discharge [5]	18.8%	14.9%	21.0%
Percent of patients with Hospitalization in the 7 days following SNF discharge	4.3%	3.3%	5.6%
Percent of patients with Hospitalization in the 30 days following SNF discharge	13.6%	11.6%	17.7%
Percent of patients with mortality within 30 days following SNF discharge	5.9%	5.4%	9.7%
Total Medicare expenditures: 30 days prior to SNF admission through 30 days after SNF discharge	\$25,062	\$32,180	\$39,433
Total Medicare expenditures: during 30 days after SNF discharge	\$5,114	\$5,003	\$6,573

Notes:

[1] There were 4,301 waiver patients, 6,032 patients in the main comparison group (with an exactly 3-day prior inpatient hospital stay), and 20,445 patients in the unrestricted comparison group.

[2] The Hierarchical Condition Category (HCC) score is a function of beneficiary chronic conditions, gender, and institutional status from the year immediately prior to the performance year and serves as a proxy for relative illness to identify the highest projected spenders.

[3] T-tests were used to test for statistically significant differences ($p < 0.05$) in bold between the restricted (preceding hospitalization of 3-days) and the waiver group, and separately, the unrestricted (preceding hospitalization of greater than 3 days) and the waiver group.

[4] "Improved/Same ADL score" and "Discharged from SNF to the Community" were constructed using Minimum Data Set (MDS) assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. Sample sizes were 3,533 waiver patients and 14,166 patients in the unrestricted comparison group. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment. Sample sizes were 3,609 waiver patients and 16,248 patients in the unrestricted comparison group.

[5] ED visits are inclusive of all ED visits, whether or not the patient was subsequently admitted as an inpatient.

Table 5 provides the results of the multivariate regression on the outcomes of interest using the main comparison group (patients with a prior inpatient hospitalization lasting exactly 3 days). We conducted two separate regressions for each outcome listed in the rows. All observable characteristics listed in Table 4 and Table 11 (see the Appendix) were controlled for in the regression analyses. The first regression included ACO-aligned beneficiaries under the waiver (N=4,301) and beneficiaries in the main comparison group (N=6,032), with an indicator for any use of the waiver. The second regression included waiver beneficiaries and beneficiaries in the unrestricted comparison group (N=20,445). The second regression also used two indicators to estimate the different impact of the waiver on direct and fewer than 3-day waiver patients. The two regressions were otherwise similar. The figures in the table represent the marginal effect of the waiver indicators on the outcome, and an asterisk indicates that the effect was statistically significant at the 5 percent level.

Generally, we see the same direction and significance for all waiver patients and each of the subgroups of waiver patients. Waiver patients had shorter lengths of stay and lower Medicare spending when spending is measured over the period spanning 30 days prior to SNF admission and 30 days after SNF discharge. On the other hand, waiver patients were more likely to have had an ED visit or a hospitalization within 7 days of SNF discharge and within 30 days of SNF discharge. Fewer than 3-day waiver cases had lower Medicare expenditures during the 30 days following SNF discharge compared with non-waiver patients in the main comparison group. Direct waiver cases had higher expenditures over this period. However, these associations were not statistically significant.

Table 5. Regression Results – Marginal Effects of the SNF Waiver Compared to SNF Use with a 3-Day Preceding Hospitalization, 2014-2015

Outcomes [2] [3] [4]	All Waiver [1]	Direct Waivers	Fewer than 3-Day Waivers
	Marginal Effect	Marginal Effect	Marginal Effect
Improved/Same ADL score at SNF discharge	0.31	0.19	0.47
Length of SNF stay	-1.15	-0.59	-1.98
Discharged from SNF to community	-0.85	-1.13	-0.41
Any ED visit within 7 days following SNF discharge	2.09	2.14	2.39
Any ED visit within 30 days following SNF discharge	2.85	2.34	3.79
Hospitalization within 7 days following SNF discharge	1.79	1.48	2.58
Hospitalization within 30 days following SNF discharge	1.62	1.22	2.32
Mortality within 30 days following SNF discharge	-0.41	-0.81	0.25

Outcomes [2] [3] [4]	All Waiver [1]	Direct Waivers	Fewer than 3-Day Waivers
	Marginal Effect	Marginal Effect	Marginal Effect
Log of total Medicare expenditures: 30 days prior to SNF admission through 30 days after SNF discharge	-16.86	-24.05	-4.65
Log of total Medicare expenditures: during 30 days after SNF discharge	5.30	12.07	-4.20

Notes:

[1] Patients were excluded from the sample if the SNF stay was not linked to a corresponding 5-day PPS Minimum Data Set (MDS) assessment since covariates include MDS variables from the 5-day assessment. The final sample included 3,836 waiver patients (2,952 direct waivers and 884 fewer than 3-day waivers) and 5,128 patients in the main comparison group. Statistically significant differences ($p < 0.05$) in bold.

[2] "Improved/Same ADL score" and "Discharged from SNF to the community" were constructed using MDS assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. Sample sizes were 3,533 waiver patients and 4,621 patients in the comparison group. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment. Sample sizes were 3,609 waiver patients and 4,785 patients in the comparison group.

[3] Dichotomous outcomes were estimated using multivariate probit regression. Medicare expenditures were normalized by logging the value and modeled using ordinary least squares regression. Length of SNF stay was estimated using a multivariate negative binomial model.

[4] The marginal effect of the waiver for dichotomous outcomes are interpreted as the percentage point difference between waiver patients and main comparison patients in the outcome probability. Total expenditures were logged; thus, the point estimate represents an average marginal effect in percentage terms of the difference between the waiver and comparison patients after risk-adjustment. The marginal effect for length of stay is in number of days.

As shown in Table 12 (see the Appendix), using the unrestricted comparison group (which appears to be less healthy than the waiver group on average), we still found waiver use to be associated with higher ED visits and hospitalizations within 7 days of SNF discharge but not within 30 days of SNF discharge. Waiver patients also still had lower Medicare expenditures from 30 days before SNF admission to 30 days after SNF discharge. However, compared to the unrestricted comparison group, waiver patients were more likely to be discharged to the community and had a lower probability of mortality within 30 days of SNF discharge.

As discussed above, comparing outcomes between waiver and non-waiver SNF patients does not allow for estimating any impacts of the waiver related to inducing SNF use. Although we cannot explicitly measure the impact of the waiver on SNF use, we tried several methods for investigating this relationship. First, we examined the percentage of aligned beneficiaries using any SNF services for participating versus non-participating ACOs. We did not find the proportion of SNF users to increase in 2014 and 2015 among participating ACOs versus non-participating ACOs.

Second, we applied a sample selection model that predicted SNF use and estimated the unconditional effect of the waiver by adjusting for the predicted probabilities. We used the estimates obtained from the selection model to compare the predicted probability of SNF use among waiver patients versus patients in the main comparison group based on available patient characteristics. All waiver and comparison patients used SNF services, but if the waiver induced SNF use among patients who may not have otherwise used SNF, then the expected rate of SNF use among waiver patients (i.e., the average predicted probability) would be *lower* compared to the non-waiver patients.

Table 6 shows that the average predicted probability of SNF use among waiver patients was 13.30 percent, which is higher than the predicted probability of SNF use among patients in the main comparison group (11.9 percent, $p < 0.001$). The predicted probability of SNF use among the unrestricted comparison group was 13.27 percent (comparable to waiver patients, $p = 0.897$). Thus, from this analysis, the waiver did not appear to induce SNF use among patients with characteristics different from traditional SNF users. Waiver patients were expected to use SNF services at equal or greater rates than the comparison patients who used SNF based on available patient characteristics.

Table 6. Predicted Probability of Using SNF, 2014-2015

	All Waiver Patients (N=3,836)	Preceding Hospitalization Was 3 Days (Main Comparison Group) (N=5,128)	P-value [1]	Preceding Hospitalization Was >3 Days (Unrestricted Comparison Group) (N=17,545)	P-value [1]
Average predicted (risk-adjusted) probability of SNF use in year	13.30%	11.93%	<0.001	13.27%	0.897

Note: [1] P-value based on a t-test with all waiver patients.

Table 7 shows the marginal effects estimated using the sample selection model. By adjusting the estimated marginal effect of the waiver for the probability that a given patient would have used a SNF based on patient and market characteristics, we are also accounting for the probability that the waiver patients would have used the SNF in the absence of the waiver (hence, we estimated the marginal effect of the waiver “unconditional” on the patient using a SNF). The full list of patient and market variables used to predict SNF use is described in the Appendix. We report the p -value for testing whether there is any correlation (ρ) between the probability of using a SNF and the outcome for all waiver patients and separately for direct waiver and fewer than 3-day waiver patients. A statistically significant ρ (p -value ≤ 0.05) suggests that we should reject the hypothesis that sample selection bias was not likely to have been present in the estimated marginal effects in Table 7 (statistically significant values of ρ are bolded).

Out of the nine outcomes we examined,¹⁴ there were six where we could reject the hypothesis that the probability that the patient using the SNF did not influence the estimated marginal effect of the waiver – improved/same ADL score at SNF discharge, ED visit within 30 days of SNF discharge, hospitalization within seven days of SNF discharge, 30-day mortality following SNF discharge, total Medicare expenditures in the period spanning 30 days before and after the SNF stay, and total Medicare expenditures in only the 30 days after SNF discharge. For each outcome, though, the direction and significance for all waiver patients and each of the subgroups remained the same as in Table 5. The statistically significant unconditional marginal effects of the waiver on 30-day ED visits, seven-day hospitalizations, and 30-day hospitalizations were still positive and larger than

¹⁴ The sample selection model was not estimated for length of SNF stay because this outcome was modeled as a negative binomial distribution, and the bivariate sample selection model requires the joint probability of the outcome and SNF use to be normally distributed.

the conditional effects. The unconditional marginal effect of the waiver on total Medicare expenditures after the SNF stay was still statistically significant and more negative than the conditional marginal effect.

Table 7. Selection Model Results – Unconditional Marginal Effects of SNF Waiver Compared to SNF Use with a 3-Day Preceding Hospitalization, 2014-2015

Outcomes [2] [3] [4] [5]	All Waiver [1]		Direct Waivers		Fewer than 3-Day Waivers
	Eq 1: H ₀ : $\rho=0$ (p-value)	Marginal Effect	Eq 2: H ₀ : $\rho=0$ (p-value)	Marginal Effect	Marginal Effect
Improved/Same ADL score at SNF discharge	0.006	-0.49	0.005	-0.59	-0.24
Discharged from SNF to community	0.737	0.33	0.733	0.47	-0.05
Any ED visit within 7 days following SNF discharge	0.466	2.00	0.473	1.83	2.45
Any ED visit within 30 days following SNF discharge	0.002	3.16	0.002	2.71	4.31
Hospitalization within 7 days following SNF discharge	0.094	2.36	0.038	1.50	4.04
Hospitalization within 30 days following SNF discharge	0.113	2.68	0.108	2.31	3.58
Mortality within 30 days following SNF discharge	<0.001	-0.13	<0.001	-0.54	0.98
Log of total Medicare expenditures: 30 days prior to SNF discharge through 30 days after SNF discharge	0.005	-21.53	0.008	-27.40	-4.95
Log of total Medicare expenditures: during 30 days after SNF discharge	<0.001	4.63	<0.001	5.75	2.03

Notes:

[1] Patients were excluded from the overall sample if they had a SNF stay but it was not linked to a corresponding 5-day PPS Minimum Data Set (MDS) assessment since covariates used in the outcome equation include MDS variables from the 5-day assessment. The final sample includes all patients aligned with a participating ACO in 2014 or 2015, including 72,508 patients who used a SNF and had a 5-day PPS MDS assessment and 1,444,576 beneficiaries who never used a SNF. SNF patients include 3,836 waiver patients (2,952 direct waivers and 884 fewer than 3-day waivers), 5,128 patients in the main comparison group, and 63,544 patients not meeting the criteria for the main comparison group.

[2] “Improved/Same ADL score” and “Discharged from SNF to the community” were constructed using MDS assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. Sample sizes were 3,533 waiver patients and 4,621 patients in the comparison group. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment. Sample sizes were 3,609 waiver patients and 4,785 patients in the comparison group.

[3] Medicare expenditures were normalized by logging the value and modeled using ordinary least squares regression in the context of a bivariate sample selection model.

[4] Bold values are statistically significant ($p < 0.05$) for the correlation between the probability of using a SNF and the outcome. The marginal effect of the waiver for dichotomous outcomes are interpreted as the percentage point difference between waiver patients and comparison patients in the outcome probability. Total expenditures were logged; thus, the point estimate represents an average marginal effect in percentage terms of the difference between the waiver and comparison patients after risk-adjustment.

[5] Unconditional marginal effects of the SNF waiver account for a patient's predicted probability of SNF use based on a set of patient and market-level characteristics. The sample selection model was not estimated for length of SNF stay because this outcome was modeled as a negative binomial, and the bivariate sample selection model requires the joint probability of the outcome and SNF use to be normal distributed.

We also analyzed the marginal effects of the waiver compared to SNF patients who resided in the waiver-participating ACOs' markets, with a prior inpatient hospitalization of exactly three days but not exposed to an ACO (see Table 13 in the Appendix). Although the data were only available for 2014, this analysis examined whether the effect of the waiver was different when compared to patients who did not use the waiver because of nonrandom reasons like ineligibility or patient preference. Generally, the direction and significance of the waiver's impact on outcomes remained the same as in our main analyses. The waiver was still associated with shorter lengths of stay in the SNF and lower Medicare expenditures in the period spanning 30 days before and after the SNF stay. However, waiver patients had statistically significant higher total Medicare expenditures than near-market comparison patients in the 30 days after SNF discharge. Under this analysis, waiver patients were more likely than the comparison patients to be discharged to the community, but the impact was not statistically significant. The magnitudes of the waiver's effect on ED visits or hospitalizations in seven or 30 days after SNF discharge were larger than the effects estimated in our main analysis, and the significance of the direct or fewer than 3-day waivers changed in some instances.

Subgroup analyses

Table 8 examines whether the impact of the SNF 3-day waiver differed according to whether the participating ACO had prior experience with the SNF 3-day waiver, had a dedicated waiver care coordinator, or required physician oversight of SNF admissions. Using the main comparison group, we reran the regressions in Table 5 that included the all-waiver indicator and added three variables interacting the all-waiver indicator with each of the three ACO characteristics. The figures in Table 8 represent the difference between the marginal effects of the waiver for patients of participating ACOs with and without the given characteristic. An asterisk indicates that the difference was statistically significant at the 5 percent level.

Although the results in Table 5 showed no significant impact of the waiver on the probability of community discharge, waiver patients of ACOs that had prior experience with a SNF 3-day waiver were nearly 4 percentage points more likely to be discharged to the community than other waiver patients. On average, waiver patients were 1.8 percentage points more likely than comparison patients to have a hospitalization within seven days of SNF discharge, but for patients of ACOs with prior waiver experience, the waiver's estimated impact was 1.4 percentage points lower than for other waiver patients. The estimated impact of the waiver on total Medicare expenditures between 30 days before and after the SNF stay was 6.2 percent lower for ACOs with a dedicated waiver care coordinator and 6.2 percent lower for ACOs that required physician oversight of SNF admissions. While there was no statistically significant impact of the waiver on total expenditures

in the 30 days following SNF discharge, the estimated impact of the waiver on these expenditures was 24.9 percent lower for ACOs that had physician oversight of SNF admissions.

Table 8. Regression Results – Additional Impact of SNF Waiver Associated with Selected ACO Characteristics, 2014-2015

Outcomes [1] [2] [3] [4]	ACO Had Experience with SNF 3-day Waivers	ACO Had a Dedicated Waiver Care Coordinator	ACO Had Physician Oversight of SNF Admissions
	Difference in Marginal Effect of Waiver	Difference in Marginal Effect of Waiver	Difference in Marginal Effect of Waiver
Improved/Same ADL score at SNF discharge	-1.23	1.08	0.40
Length of SNF stay	-1.64	-3.90	-0.97
Discharged from SNF to community	3.91	-0.82	-0.26
Any ED visit within 7 days following SNF discharge	-0.30	0.19	0.01
Any ED visit within 30 days following SNF discharge	2.40	-2.87	-4.08
Hospitalization within 7 days following SNF discharge	-1.41	0.86	1.02
Hospitalization within 30 days following SNF discharge	-0.69	-1.49	-3.51
Mortality within 30 days following SNF discharge	0.31	-1.75	-0.59
Log of total Medicare expenditures: 30 days prior to SNF discharge through 30 days after SNF discharge	-3.97	-6.22	-6.19
Log of total Medicare expenditures: during 30 days after SNF discharge	9.15	-9.83	-24.89

Notes:

[1] The sample includes 3,836 waiver patients and 5,128 patients in the main comparison group. There were 1,784 waiver patients aligned with ACOs with prior experience with SNF 3-day waivers, 2,661 aligned with ACOs with a dedicated waiver coordinator, and 977 aligned with ACOs with physician oversight of SNF admissions. Statistically significant differences ($p < 0.05$) in bold.

[2] “Improved/Same ADL score” and “Discharged from SNF to the community” were constructed using Minimum Data Set (MDS) assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment.

[3] Dichotomous outcomes were estimated using multivariate probit regression total expenditures were logged; thus, the point estimate represents an average marginal effect in percentage terms of the difference between the waiver and comparison patients after risk-adjustment. Length of SNF stay was estimated using a multivariate negative binomial model.

[4] The marginal effect of the waiver for dichotomous outcomes is interpreted in terms of percentage points. For Medicare expenditures, the marginal effect should be interpreted in terms of percentage of expenditures. The marginal effect for length of stay is in number of days.

Discussion

ACOs participating in the SNF 3-day waiver enrolled 4,301 patients in 2014 and 2015. Most waiver patients entered SNFs without a prior inpatient hospital admission, directly from the ED or after being in the hospital for observation without being admitted. Waiver patients without a prior inpatient hospitalization were generally similar in patient characteristics to those who did have a prior inpatient hospitalization lasting fewer than three days. Compared to non-waiver SNF patients aligned with participating ACOs who had a prior inpatient hospitalization lasting exactly three days, waiver patients had shorter SNF stays and lower Medicare expenditures (counting the period 30 days before the SNF stay through 30 days after the SNF stay). This finding is not surprising since waiver patients have no (or shorter) hospitalizations prior to SNF admission.

On the other hand, waiver use was associated with higher rates of ED visits and hospitalizations in the seven and 30 days following SNF discharge. We found similar associations when examining the unconditional effect of the waiver. We did not find evidence that the availability of the waiver induced SNF use among patients who would otherwise have not used a SNF. However, we cannot conclude that the waiver did not induce any additional SNF use compared to a patient population with no waiver available. Now that the waiver has been in place for multiple years—and especially for Next Generation ACOs that transitioned from the Pioneer model—it will be interesting to learn about the ACOs' views on whether the waiver induces SNF use by patients who would otherwise not be eligible for SNF.

We tested several ACO characteristics related to the ACO's management of the waiver. We found that waiver cases at ACOs that reportedly had clinician oversight of all SNF admissions for ACO patients were associated with lower Medicare expenditures, both in terms of expenditures from 30 days before SNF admission through 30 days after SNF discharge and expenditures during the 30 days after SNF discharge only. These waiver cases also were negatively associated with ED and hospitalizations after SNF discharge, but the association was not statistically significant. ACOs having previous experience with SNF 3-day waivers tended to have higher rates of waiver patients discharged to the community compared to waiver patients at ACOs without prior experience. ACOs having a dedicated waiver care coordinator was associated with lower total Medicare spending for 30 days before SNF admission through 30 days after SNF discharge.

Appendix

SNF 3-day rule waiver background

The SNF 3-day prior inpatient hospitalization has been a requirement for Medicare coverage of SNF services since Medicare was established in 1965. The requirement served to limit the use of scarce skilled nursing beds and ensure patients received appropriate medical care. In 1965, three days was the amount of time generally needed to admit, evaluate, and establish a plan of care for a patient.¹⁵

In 1982, the Tax Equity and Fiscal Responsibility Act allowed the Health Care Financing Administration (HCFA), the predecessor to CMS, to grant waivers of the 3-day rule as long as Medicare costs did not increase and the acute care nature of the Medicare program did not change. HCFA implemented demonstration projects in Oregon and Massachusetts that waived the 3-day rule. Oregon was found to save money while Massachusetts showed an annual cost increase. Overall, HCFA found the net savings to be small, with no accompanying effect on the quality of patient care and decided not to change the SNF 3-day rule.¹⁶

In 1988, Congress waived the rule entirely with the Medicare Catastrophic Coverage Act (MCCA). It was repealed one year later largely due to a study in Pennsylvania that showed a 243 percent increase in Medicare payments from increased SNF care attributed to dropping the 3-day rule.¹⁷ The belief was that nursing homes were taking advantage of the higher Medicare reimbursement for patients that could be more appropriately managed with long-term nursing care, which is not covered by Medicare, but instead is often paid for by state Medicaid programs with lower reimbursement rates.¹⁸ However, a later study noted that other provisions in the MCCA resulted in changes in the SNF payer mix that shifted self-pay (out-of-pocket) expenses to Medicare covered expenses, resulting in growth in Medicare payments that may have been unrelated to the elimination of the 3-day rule.¹⁹

CMS has granted 3-day rule waivers to Medicare managed care plans and the Program for All-Inclusive Care of the Elderly (PACE). These waivers have shown modest cost savings and higher patient satisfaction, but it is difficult to isolate the effect of the waiver from other features (such as care management and access to community-based services) of these plans.²⁰ A recent study by Brown University researchers compared Medicare managed care plans with and without the 3-day inpatient hospitalization requirement and examined hospital length of stays and hospital and SNF admissions.²¹ They found that the 3-day waiver was associated with lower overall average hospital

¹⁵ Lipsitz, Lewis A., 2013, "The 3-Night Hospital Stay and Medicare Coverage for Skilled Nursing Care," *Journal of the American Medical Association*, Vol. 310, No. 14: 1441-2.

¹⁶ *Ibid*

¹⁷ *Ibid*

¹⁸ *Ibid*

¹⁹ Aaronson, WE, Zinn JS, Rosko, MD, 1994, "The success and repeal of the Medicare Catastrophic Coverage Act: a paradoxical lesson for health care reform," *Journal of Health Politics, Policy and Law*, 19(4); 753-72.

²⁰ Lipsitz, Lewis A., 2013, "The 3-Night Hospital Stay and Medicare Coverage for Skilled Nursing Care," *Journal of the American Medical Association*, Vol. 310, No. 14: 1441-2.

²¹ Grebla, Regina, Keohane, Laura, Lee, Yoojin, Lipsitz, Lewis, Rahman, Momotazur, Trivedi, Amal, 2015, "Waiving the Three-Day Rule: Admissions and Length-of-Stay at Hospitals and Skilled Nursing Facilities Did Not Increase," *Health Affairs*, 34(8), 1324-1330.

length of stay among SNF users. There were no increases in the probability of a SNF admission or in SNF length of stay.

Recent CMS SNF 3-day rule waivers

Massachusetts General Hospital Care Management Program: In July 2010, CMS granted a waiver of the SNF 3-day rule to Massachusetts General Hospital (MGH) to pilot test direct SNF admissions for Medicare beneficiaries participating in its Care Management Program (CMP) as part of the Care Management for High Cost Beneficiaries (CMHCB) demonstration. MGH began direct SNF admissions in August 2010 and two of its affiliates in the Partners network began in August 2011. Under the MGH CMP SNF waiver pilot, patients could be directly admitted to a SNF from one of five locations: home, a primary care physician's office, the emergency room (ER), and ER observation unit, or an admit-to-observation unit. Patients admitted directly from home required an evaluation by a physician within three days prior to the SNF admission.

RTI evaluated the SNF waiver pilot and determined that MGH met its goals of having no more than 10 percent of patients hospitalized within seven days of the start of the SNF stay (a rate of 5 percent was observed); having a high rate of community discharges following a SNF stay (78 percent were discharged home with self-care or home care services); and an appropriate SNF length of stay (the average length of stay was 20 days). They also found lower rates of acute care utilization and lower inpatient costs among waiver beneficiaries in the 60-day follow-up period. However, the evaluation was limited by the very small number of waiver participants (only 91 beneficiaries were admitted to a SNF under the waiver) and difficulties in constructing a comparison group given the small sample size and the non-random nature of participation in the waiver.

BPCI Model 2: CMS has allowed participating acute care hospitals and physician group practices under BPCI Model 2 to use a SNF 3-day waiver. The BPCI waiver differs from the Pioneer ACO SNF 3-day waiver in several key ways. First, since BPCI Model 2 episodes are initiated by an acute care hospitalization, the BPCI SNF 3-day waiver does not allow for direct admission to the SNF, only shorter than 3-day prior inpatient hospitalizations for eligible patients. Second, BPCI Model 2 participants in the waiver need only a majority of their SNF partners to receive 3 stars under the CMS 5-Star Quality Rating System. Under the ACO SNF 3-day waiver, all partner SNFs must have 3 stars at the time of selection.

MSSP Track 3 and Next Generation ACOs: The June 6, 2015 *Final Rule on the Medicare Shared Savings Program:* ACOs established that the SNF 3-day waiver would be available for ACOs participating in the newly formed Track 3 starting in 2017. ACOs in Track 3 accept higher two-sided risk financial (shared savings and losses) and will have prospectively assigned beneficiaries. The waiver has also been available to Next Generation ACOs starting January 1, 2016. Similar to the Pioneer ACOs, these ACOs face the strongest incentives to control total patient costs.

Qualitative methods

Content analysis: The content analysis began with a review of two of the ACOs' SNF 3-day waiver applications, chosen at random, to determine which of the research questions could be answered using the information extracted from this data source. Although the breadth and depth of

information in each application differed, the applications were largely similar because applicants were required to respond to specific items. As a result, we made the assumption that information found in the two sample applications would be found consistently in all applications. Responses to questions that could not be extracted from the applications were tagged. Following the same procedure, we next reviewed a sample of documents compiled by the ACO evaluation team to determine if information for any of the remaining unanswered research questions could be extracted from these documents. These documents included ACO evaluation quarterly interview notes and case study reports. We also extracted some descriptive data about the ACOs from these documents to provide context for the participant ACOs. The final set of unanswered questions after reviewing all of these documents became the basis of a short interview protocol (attached below).

The next step was to develop tools to record information extracted during the content analysis. We first developed a template to record simple descriptive, background information. The template presents relevant data elements as columns and the 14 participating ACOs listed as rows. We also created a data extraction tool to record additional, more complex qualitative data. A separate tool was created for each topical area that addressed a research question for each ACO that received a waiver.

We reviewed the ACO evaluation documents and the applications and populated the two recording tools with data extracted from these sources. This report was developed by looking across the research domains for common themes as well as outlier information.

Telephone semi-structured interviews: The L&M evaluation team conducted interviews with representatives of waiver-recipient ACOs as part of the final set of quarterly interviews in May-June of 2015 (see interview guide below). The interview questions focused on information that was not available in the SNF 3-day waiver applications or that might have evolved since their applications. These questions involved the participating ACO's expectations for the waiver and any evolution from original expectations; relationships with SNFs (including the number of SNFs participating in the waiver); the number of patients in the waiver to date; any changes to the structure of the care team and care protocols or in self-monitoring; and, finally, whether the ACO had any evidence to show that transitions of care to the SNF had improved under the waiver.

The data collected from the telephone interviews were entered by interviewers into the qualitative analyses software program, Dedoose. The team then developed a spreadsheet into which we recorded interview responses categorized by research domain. Data were extracted from Dedoose and entered by ACO into the spreadsheet. Responses were reviewed across ACOs and examined for common themes and outliers. Information was then synthesized and reported by research domain.

**Interview Guide: Skilled Nursing Facility (SNF) 3-Day Waiver
Questions for Participating Pioneer ACOs**

1. What is the current number of ACO beneficiaries on the waiver?
2. Following are some questions about the staffing and structure of your ACO as they relate to the waiver:
 - a. What is the most up to date number of primary care physicians affiliated with your ACO?
 - b. What is the most up to date number of SNFs participating with you in the waiver?
 - c. Do you have staff (e.g., a case manager) whose role, at least in part, is dedicated to overseeing the SNF waiver cases such as authorizing and/or overseeing SNF admissions? If yes, please describe (list) the staffing model.
3. Describe your expectations for the SNF waiver and what you have implemented since you were awarded the waiver.
 - a. Why did you apply for the SNF waiver?
 - b. What were your expectations for improving patient care and forwarding the goals of the three-part aim?
 - c. Do you have any evidence that these goals are being achieved through the waiver program?
 - i. If yes, what is the evidence?
 - ii. If no, please explain why not (e.g., too soon to see results).
 - d. Have there been any barriers to achieving your SNF waiver goals to date? If yes, how are you addressing/did you address these challenges?
4. Describe your relationships with your SNF preferred providers before and after waiver implementation.
 - a. Please describe how you decided on your SNF partner(s) for the waiver program.
 - b. Please briefly describe the protocols or structured communication tools you're using to ensure more appropriate care transitions.
 - i. What is working well, or less well?
5. Do you have any evidence showing that the transition of care has improved? That is, that the patient is more often than prior to the waiver, going to the right facility at the right time for the care they need?
 - a. If yes, what is the evidence?
 - b. If no, please explain why not (e.g., too soon to see results).

Data sources for quantitative analyses

Medicare administrative and claims data

We used Medicare administrative and claims data to examine patient and SNF stay characteristics. The Beneficiary Summary Files were used to obtain patient demographic characteristics (age, sex, race, Medicaid dual eligibility status). We also obtained HCC scores, hospitalization in the prior year, and total expenditures from the HCC file and Beneficiary Cost & Use files for 2014 and 2015. SNF and other Medicare claims were used to construct the length of the SNF stay and examine utilization in the period prior to SNF admission (e.g., whether the SNF patient had an ED or observation stay in the 7 days before SNF admission).

Minimum Data Set (MDS)

The MDS is a comprehensive patient assessment instrument used for residents in Medicare or Medicaid-certified nursing facilities. To receive Medicare payment, SNFs are required to administer the MDS upon a patient's entry to the facility and at discharge, as well as on days five, 14, 30, 60, 90, and quarterly thereafter. The MDS contains items that collect or measure personal and demographic data, sensory status, cognitive status, neurological and emotional status, preferences for routine and activities, functional status, pain status, bladder and bowel status, patient history and active diagnoses, swallowing and nutritional status, skin conditions, medications, care management, restraint use, and patient discharge destination.

To describe the SNF waiver patients, we used items from the five-day MDS assessment, which is required to be completed within eight days of patient admission. Most MDS items require a designated "look-back" period for the SNF staff to assess a patient's official status; therefore, it is the first assessment available that fully captures a patient's functional, behavioral, and cognitive status at the beginning of a SNF stay. Table 10 lists the array of metrics constructed from the five-day MDS assessment used to compare the waiver beneficiaries' functionality with those of the comparison groups. We also examined a handful of MDS-based "outcome" measures such as improvement in functional status, discharge location, and mortality using MDS discharge assessments.

Area Health Resource Files (AHRF)

The AHRF (<http://ahrh.hrsa.gov/>) is a public-use, county-level database assembled annually from over 50 data sources to inform health resources planning, analysis, and decision-making. SNF use is not random. Therefore, as part of our analysis we modeled the probability that a patient used SNF services in a given year based on various beneficiary and market characteristics, with the market defined as the county where the patient resided. We used data found in the AHRF to construct a variety of market-related variables, such as the number of home health agencies, SNF beds, or primary care physicians per capita (Table 14). We used AHRF data pertaining to 2014, when possible. Otherwise, we pulled data from the most recent year prior to 2014 for which it is available in the AHRF.

SNF waiver admissions identified using Medicare claims

Because verified SNF 3-day waiver patient lists were not available from the ACOs, we had to identify them in the Medicare administrative data. We linked SNF claims to inpatient claims by SNF admission date and hospitalization discharge dates.²² SNF 3-day waiver stays were defined as stays that did not have at least a 3-day inpatient hospitalization in the 30 days before SNF admission. As much as possible, we followed the methodology used by Mathematica Policy Research (MPR), the Learning System contractor for the Pioneer ACOs. They also developed a methodology for identifying SNF 3-day waiver stays as part of their quarterly monitoring tasks. Specifically, we followed these steps to identify admissions using the SNF 3-day waiver:

1. Identify beneficiaries aligned with a Pioneer ACO that participated in the waiver.
2. Select SNF claims with admission dates between the first date the participating ACO began the waiver (April 7 or July 1, 2014, depending on the ACO) and December 31, 2015.
3. Select SNF stays occurring at partner SNFs as designated by the participating ACO's waiver application.
4. Exclude any SNF patients with previous SNF claims in the 30 days preceding the SNF admission date.
5. Exclude SNF patients having a qualifying hospital stay in the 30 days preceding the SNF admission date. A qualifying hospital stay is an inpatient hospitalization (excluding IRF and LTCH) lasting for three or more days.
6. Steps 1 to 5 define SNF 3-day waiver stays. Waiver stays were then categorized as "direct" or "fewer than three days."
 - A. "Direct" stays were SNF stays with no qualifying prior inpatient hospitalization or SNF stays with prior inpatient hospitalizations that were fewer than three days and not immediately prior (greater than one day) to the SNF admission.
 - B. "Fewer than three days" stays were SNF stays with a fewer than 3-day inpatient hospitalization immediately prior (within one day) to the SNF admission date.

We were limited by the imperfections of using claims data to identify waiver patients. For example, not requiring the SNF 3-day waiver stays to occur only at eligible SNFs designated in the ACOs' applications resulted in substantially more direct waiver stays.

²² We investigated different claims-based methodologies for identifying waiver patients. Initially, we explored the use of the qualifying prior inpatient hospitalization dates that SNFs must report to receive payment by Medicare (see <http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c06.pdf>). SNF 3-day waiver stays were defined as stays that did not have a 3-day inpatient prior hospitalization as demarcated by the qualifying hospitalization dates. However, the dates proved unreliable, and an OIG report confirmed that these dates were not validated and substantial inaccuracies existed (see <http://oig.hhs.gov/oas/reports/region5/50200087.pdf>).

Table 9. Counts of Waiver Stays by ACO and Year

Name	April 7 to Dec. 31, 2014			January 1 to Dec. 31, 2015			Total Across 2014-2015
	Direct	Fewer than 3 days	2014 Total	Direct	Fewer than 3 days	2015 Total	
Monarch Healthcare	40	25	65	47	48	95	160
Allina Health	5	5	10	43	18	61	71
Michigan Pioneer ACO	3	1	4	4	3	7	11
Banner Health Network	223	70	293	485	150	635	928
Mount Auburn Cambridge Independent Practice Association (MACIPA)	13	5	18	38	17	55	73
OSF Healthcare	0	0	0	57	50	107	107
Partners HealthCare	171	22	193	312	71	383	576
Beth Israel Deaconess Care Organization (BIDCO)	119	20	139	416	63	479	618
Beacon Health	86	35	121	141	42	183	304
Trinity Pioneer ACO	29	9	38	84	31	115	153
Atrius Health	100	20	120	155	38	193	313
Steward Health Care System	184	57	241	360	168	528	769
Dartmouth-Hitchcock	40	15	55	115	39	154	209
Heritage California ACO	3	1	4	3	2	5	9
Total	1,016	285	1,301	2,260	740	3,000	4,301

Exclusions from analyses

Patients were excluded from multivariate analyses if the SNF stay was not linked to a corresponding 5-day PPS MDS assessment since covariates included MDS variables from the 5-day assessment. These patients were also excluded from any descriptive comparisons of MDS-based measures, since all MDS-based measures were identified using the 5-day assessment. We concluded that 5-day MDS PPS assessments were missing at random and so were not likely to influence the results. We did not find a relationship between patients missing a 5-day assessment and the month in which the SNF stay began, so sufficient run-out time for MDS assessment data did not appear to be an issue. We found that 5-day assessments were missing primarily from erroneous SNF Medicare Certification Numbers (CCNs) recorded on MDS records, which prevented the linkage of the MDS record with claims-based data. Therefore, missing 5-day assessments were inherently randomly distributed across all patient cohorts. We found no significant difference in rates of missing 5-day assessments between the direct and fewer than 3-day SNF waiver cases and some difference between the SNF waiver and comparison groups. The

missing rate for all SNF waiver stays was 10.8 percent (465 stays), whereas the rate for the restricted comparison group and the unrestricted comparison group were 15 percent (904 stays) and 14 percent (2,900 stays), respectively. Lastly, we reproduced the descriptive statistics of all claims-based measures found in Tables 3 and 4 after excluding all SNF stays without a corresponding 5-day assessment. The averages reported in Tables 3 and 4 changed only slightly (at the hundredths or thousandths decimal places) but nearly always in the same directions for all groups. There were no changes to the statistically significant differences noted in the tables. This analysis supports our conclusion that the missing rate of the 5-day assessments was at random across patients and facilities, so excluding SNF stays without a corresponding 5-day assessment from the regression models was unlikely to influence the results or our inferences in a substantive way.

Two outcome variables in this report were constructed only using MDS assessment data: Improved or Same ADL Score at SNF Discharge and Discharged from SNF to Community. For the improved/same ADL score measure, patients were not only excluded if the SNF stay was not linked to a corresponding 5-day PPS MDS assessment, but also if the relevant MDS items used to compute the ADL score were blank or missing on the 5-day assessment or the last assessment linked to the SNF stay. We did not require that the last assessment be the discharge assessment for this measure, since not all SNF stays linked to 5-day assessment were also linked to a discharge assessment but all were linked to at least one follow-up assessment. For the community discharge measure, patients were excluded if the stay was not linked to a MDS discharge assessment. Across all SNF stays in the waiver group and the main comparison group linked to a 5-day assessment (N=8,964), for example, there were 810 SNF stays where the information for the ADL outcome was blank or missing on the 5-day or last assessment. There were 570 SNF stays that did not have a discharge record, and their discharge destination was always reported if they did. Discharge assessment may not be missing at random because some patients may have needed to stay in the SNF long enough to be censored in our data. A limitation of both of these MDS-based outcome measures is that the number of days between SNF admission and discharge or last assessment varied across all patients.

Table 10. Additional Characteristics of SNF Waiver Patients

Characteristics	All Waiver Patients [1]	Direct	Fewer than 3-Day
	Mean / %	Mean / %	Mean / %
MDS Characteristics			
Interpreter needed	2.0	2.0	1.9
Functionality (MDS)			
Makes self understood sometimes or rarely/never	2.4	2.3	2.4
Understands others sometimes or rarely/never	3.4	3.5	2.9
Vision is impaired	5.3	5.4	5.0
Cognitive status is impaired	57.4	58.6	53.3
Delirium symptom present	7.8	8.1	6.7
Any depression (non-minimal)	17.2	17.2	17.1
Motion impairment	38.3	37.3	41.7
Uses a mobility device	97.6	97.9	96.6
Uses urinary appliance	92.3	91.9	93.4
Urinary incontinence (any)	52.2	53.7	46.8
Bowel incontinence (any)	29.1	30.3	24.9
Pain present	31.1	32.9	25.4
Swallowing disorder	4.5	4.6	4.1
Overall ADL score	16.6	16.7	16.2
Mid-loss ADL score (self-care)	5.1	5.1	5.0
Early-loss ADL score (mobility)	8.1	8.2	7.8
RUG IV category			
Low nursing, no therapy	4.4	4.8	3.0
Moderate/high nursing, no therapy	1.3	1.1	1.9
Very low nursing and therapy	4.2	4.4	3.7
Lower nursing, therapy, but have both	5.5	5.6	5.2
Moderate nursing, moderate/high therapy (RVA)	7.5	7.4	7.8

Characteristics	All Waiver Patients [1]	Direct	Fewer than 3-Day
	Mean / %	Mean / %	Mean / %
Moderate nursing, moderate/high therapy (RVB)	10.8	10.5	11.6
Moderate nursing, moderate/high therapy (RVC)	5.6	6.1	3.9
Moderate nursing, moderate/high therapy (RUA)	10.1	9.2	13.0
Moderate nursing, high therapy (RUB)	33.0	33.1	32.7
Moderate nursing, high therapy (RUC)	15.2	15.7	13.6
High nursing, low therapy	0.1	0.1	0.1
High nursing, high therapy	0.4	0.5	0.2
RUG absent	2.0	1.5	3.4
SNF Facilities			
5-star ratings (Dec. 2014)			
Five stars	40.6	40.1	42.1
Four stars	40.5	41.1	38.5
Three stars	10.5	11.1	8.3
Two stars	6.2	5.8	7.4
One star	0.6	0.7	0.4
No rating / unmatched facility	1.7	1.2	3.2
Size			
<50 beds	5.4	5.5	5.1
50-99 beds	31.8	31.1	33.8
100-199 beds	56.1	56.6	54.3
200 beds or more	6.7	6.7	6.8
Hospital-based	10.8	11.6	8.2
Type of control			
For profit	57.6	56.7	60.6
Non-profit	41.7	42.6	38.8
Government	0.7	0.7	0.6
Chain ownership	68.7	69.7	65.3
Number of deficiencies on previous inspection (Dec. 2014) [3]	3.6	3.4	4.3

Notes:

[1] For characteristics not based on the Minimum Data Set (MDS), the sample size of all waiver patients was 4,301 (3,276 direct waivers and 1,025 fewer than 3-day waivers). For MDS-based characteristics, patients were excluded if the SNF stay was not linked to a corresponding 5-day PPS MDS assessment. Patients were also excluded from the calculations of the means if the individual MDS item(s) used to construct the measure were missing/blank on the 5-day assessment.

[2] Statistically significant differences ($p < 0.05$) between direct and fewer than 3-day patients in bold. Tests for statistical differences were conducted using t-tests for all characteristics and outcomes.

[3] To be part of the Medicare and Medicaid programs, nursing homes must meet certain requirements set by Congress. CMS, with state and local governments, perform health and fire safety inspections of these nursing homes and investigate complaints about nursing home care. This variable is the total number of deficiencies (from inspector surveys and complaints) corresponding to the most recent nursing home inspection prior to December 31, 2014, as reported on the CMS Nursing Home Compare website.

Table 11. Additional Characteristics of SNF Waiver and Comparison Patients

Characteristics	Waiver [1]	Preceding Hospitalization Was 3 Days (Main Comparison)	Preceding Hospitalization Was >3 Days (Unrestricted Comparison)
	Mean / %	Mean / %	Mean / %
MDS Characteristics			
Makes self understood sometimes or rarely/never	2.4	3.3	4.4
Understands others sometimes or rarely/never	3.4	3.6	5.1
Vision is impaired	5.3	3.8	5
Cognitive status is impaired	57.4	50.1	55.9
Delirium symptom present	7.8	8.0	10.4
Any depression (non-minimal)	17.2	15.9	18.5
Motion impairment	38.3	49.4	39.6
Uses a mobility device	97.6	97.3	96
Uses urinary appliance	92.3	91.8	86.9
Urinary incontinence (any)	52.2	45.1	51.9
Bowel incontinence (any)	29.1	26.7	34.2
Pain present	31.1	31.0	25.6
Swallowing disorder	4.5	4.7	6.8
ADL score (overall function)	16.6	16.4	16.9
Mid-loss ADL score (self-care)	5.1	5.0	5.2
Early-loss ADL score (mobility)	8.1	7.9	8.2
RUG IV category			
Low nursing, no therapy	4.4	3.6	4.7
Moderate/high nursing, no therapy	1.3	1.4	2.8
Very low nursing and therapy	4.2	2.6	2.6
Lower nursing, therapy, but have both	5.5	4.7	6.2
Moderate nursing, moderate/high therapy (RVA)	7.5	5.3	5.6
Moderate nursing, moderate/high therapy (RVB)	10.8	9.2	9.8

Characteristics	Waiver [1]	Preceding Hospitalization Was 3 Days (Main Comparison)	Preceding Hospitalization Was >3 Days (Unrestricted Comparison)
	Mean / %	Mean / %	Mean / %
Moderate nursing, moderate/high therapy (RVC)	5.6	4.4	6
Moderate nursing, moderate/high therapy (RUA)	10.1	12.8	10.6
Moderate nursing, high therapy (RUB)	33.0	38.4	32.6
Moderate nursing, high therapy (RUC)	15.2	13.6	15.5
High nursing, low therapy	0.1	0.0	0
High nursing, high therapy	0.4	0.3	0.4
RUG absent	2.0	3.8	3.2
SNF Facilities			
5-star ratings (Dec. 2014)			
Five stars	40.6	49.3	47.0
Four stars	40.5	32.2	33
Three stars	10.5	8.8	10.2
Two stars	6.2	5.1	5.7
One star	0.6	0.8	0.9
No rating / unmatched facility	1.7	3.8	3.1
Size			
<50 beds	5.4	9.1	7.7
50-99 beds	31.8	26.1	25.2
100-199 beds	56.1	59.4	60.7
200 beds or more	6.7	5.4	6.4
Hospital-based	10.8	8.8	8.5
Type of control			
For profit	57.6	56.4	58.4
Non-profit	41.7	41.3	40
Government	0.7	2.3	1.6
Chain ownership	68.7	55.8	60.3
Number of deficiencies on previous inspection (Dec. 2014) [3]	3.6	3.0	3.1

Notes:

[1] For characteristics not based on the Minimum Data Set (MDS), there were 4,301 waiver patients, 6,032 patients in the main comparison group (with an exactly 3-day prior inpatient hospital stay), and 20,445 patients in the unrestricted comparison group.

For MDS-based characteristics, patients were excluded if the SNF stay was not linked to a corresponding 5-day PPS MDS assessment. Patients were also excluded from the calculations of the means if the individual MDS item(s) used to construct the measure were missing/blank on the 5-day assessment.

[2] T-tests were used to test for statistically significant differences ($p < 0.05$) in bold between the restricted (preceding hospitalization of 3-days) and the waiver group, and separately, the unrestricted (preceding hospitalization of greater than 3 days) and the waiver group.

[3] To be part of the Medicare and Medicaid programs, nursing homes must meet certain requirements set by Congress. CMS, with state and local governments, perform health and fire safety inspections of these nursing homes and investigate complaints about nursing home care. This variable is the total number of deficiencies (from inspector surveys and complaints) corresponding to the most recent nursing home inspection prior to December 31, 2014, as reported on the CMS Nursing Home Compare website.

Table 12. Regression Results – Marginal Effects of SNF Waiver Compared to SNF Use with More than 3 Days Preceding Hospitalization, 2014-2015

Outcomes	All Waiver	Direct Waivers	Fewer than 3-Day Waivers
	Marginal Effect	Marginal Effect	Marginal Effect
Improved/Same ADL score at SNF discharge	0.39	0.14	0.82
Length of SNF stay	-1.98	-1.56	-2.77
Discharged from SNF to community	2.48	2.44	2.51
Any ED visit within 7 days following SNF discharge	1.15	1.05	1.37
Any ED visit within 30 days following SNF discharge	-0.04	-0.68	1.18
Hospitalization within 7 days following SNF discharge	1.57	0.98	2.55
Hospitalization within 30 days following SNF discharge	-1.11	-1.55	-0.27
Mortality within 30 days following SNF discharge	-2.11	-2.54	-1.15
Log of total expenditures from 30 days before SNF discharge to 30 days after SNF discharge	-30.13	-35.95	-17.80
Log of total expenditures during 30 days after SNF discharge	-7.78	-2.94	-16.20

Notes:

[1] Patients were excluded from the sample if the SNF stay was not linked to a corresponding 5-day PPS Minimum Data Set (MDS) assessment since covariates include MDS variables from the 5-day assessment. The final sample(s) includes 3,836 waiver patients (2,952 direct waivers and 884 fewer than 3-day waivers) and 17,545 in the unrestricted comparison group. Statistically significant differences ($p < 0.05$) in bold.

[2] “Improved/Same ADL score” and “Discharged from SNF to the community” were constructed using MDS assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment.

[3] Dichotomous outcomes were estimated using multivariate probit regression. Medicare expenditures were normalized by logging the value and modeled using ordinary least squares regression. Length of SNF stay was estimated using a multivariate negative binomial model.

[4] The marginal effect of the waiver for dichotomous outcomes is interpreted as the percentage point difference between waiver patients and comparison patients in the outcome probability. Total expenditures were logged; thus, the point estimate represents an average marginal effect in percentage terms of the difference between the waiver and comparison patients after risk-adjustment. The marginal effect for length of stay is in number of days.

Table 13. Regression Results – Marginal Effects of SNF Waiver Compared to Patients in an ACO Market and Not Aligned with an ACO with a 3-Day Hospital Stay, 2014-2015

Outcomes	All Waiver	Direct Waivers	Fewer than 3-Day Waivers
	Marginal Effect	Marginal Effect	Marginal Effect
Improved/Same ADL score at SNF discharge	-0.93	-2.27	1.00
Length of SNF stay	-2.50	-1.38	-3.67
Discharged from SNF to community	1.91	-0.09	4.89
Any ED visit within 7 days following SNF discharge	4.69	6.08	5.23
Any ED visit within 30 days following SNF discharge	5.45	5.48	6.31
Hospitalization within 7 days following SNF discharge	3.22	4.80	3.93
Hospitalization within 30 days following SNF discharge	5.55	6.43	5.78
Mortality within 30 days following SNF discharge (% points)	-0.74	-0.38	-1.16
Log of total expenditures from 30 days before SNF discharge to 30 days after SNF discharge	-13.15	-16.93	-7.76
Log of total expenditures during 30 days after SNF discharge	45.90	58.52	30.39

Notes:

[1] The sample consists of 1,221 waiver patients who were admitted to a SNF in 2014 and 390 ACO market comparison patients admitted to a SNF after April 7, 2014. Patients were included if the SNF stay was linked to a corresponding 5-day PPS Minimum Data Set (MDS) assessment since covariates include MDS variables from the 5-day assessment. Statistically significant differences ($p < 0.05$) in bold.

[2] “Improved/Same ADL score” and “Discharged from SNF to the community” were constructed using MDS assessment data. For the activities of daily living (ADL) measure, patients were also excluded from the sample if the relevant MDS items on the first or last assessment were coded blank or missing. For the community discharge measure, patients were also excluded if the stay was not linked to a MDS discharge assessment.

[3] Dichotomous outcomes were estimated using multivariate probit regression. Medicare expenditures were normalized by logging the value and modeled using ordinary least squares regression. Length of SNF stay was estimated using a multivariate negative binomial model.

[4] The marginal effect of the waiver for dichotomous outcomes is interpreted as the percentage point difference between waiver patients and comparison patients in the outcome probability. Total expenditures were logged; thus, the point estimate represents an average marginal effect in percentage terms of the difference between the waiver and comparison patients after risk-adjustment. The marginal effect for length of stay is in number of days.

Analytic methods

Methods to calculate the conditional effect of the waiver

Table 4 showed that waiver patients differed from the main comparison group in important ways. These differences must be accounted for in disentangling the effect of patient selection into the waiver from the impact of the waiver.

Multivariate generalized linear regression of the outcome of interest, Y , on a binary indicator for whether individual i used the waiver, w_i , a vector of indicators to capture the fixed effect of the ACO on the outcome, ACO_i , and a vector of patient characteristics, X_i , associated with the outcome (E1). The ACO fixed effect would capture any ACO-specific waiver eligibility rules that we may not be able to observe.

$$(E1) \quad Y_i = \alpha_y + \beta_1 w_i + \beta_2 ACO_i + \beta_3 X_i + \varepsilon_{yi}$$

For continuous outcome measures (i.e., Medicare expenditures) we used ordinary least squares regression. Total Medicare expenditures were skewed highly rightward across the sample of patients. Thus, to meet the assumptions of ordinary least squares regression (i.e., normally distributed errors over observations), we transformed our two expenditure variables by using the natural log of total Medicare expenditures. The discrete and continuous outcome measure of SNF length of stay was also highly skewed rightward. For this measure we used negative binomial regression. All other outcomes were binary and for these we used probit regression. We report the estimated average marginal effects of the waiver calculated using regression results.

We also explored using a propensity score approach to adjust for the underlying differences in patient characteristics between the waiver and comparison groups. Note that when the outcome regression is correctly specified (i.e., all relevant variables are included and their relationship to the outcome variable is correctly modeled), propensity score approaches are not necessary because there is no additional bias to remove. If we do not believe that the propensity score model can be adequately specified given observable differences, then the propensity score method will not successfully remove waiver-related selection bias and multivariate linear regression will likely produce a similarly (if not less) biased estimate with less random error. We found that conventional propensity score methods and multivariate linear regression adjusting for all observed patient characteristics produced similar results and therefore decided to rely solely on estimates using multivariate linear regression.

Methods to calculate the unconditional effect of the waiver among ACO-aligned beneficiaries

Since SNF use is not random, we must now account for the differences of patients who used SNF as well as the selection of patients into the waiver. To estimate the unconditional effect of the waiver on the outcomes of interest, we needed to use a comparison group consisting of both SNF and non-SNF users in our sample of ACO beneficiaries.

We used a bivariate sample selection model to correct for the non-random nature of SNF use.²³ We modeled an individual's latent propensity to use SNF services (S_i^*) in reduced form as:

$$(E2) \quad S_i^* = \alpha_s + \beta_1 Z_i + \beta_2 ACO_i + \beta_3 M_i + \varepsilon_{si}$$

where an individual uses SNF services ($S_i=1$) when $S_i^* > 0$, and otherwise $S_i=0$; α_s is the constant; Z_i is a subset of the claims-based, baseline covariates included in the vector X in equation E1; the covariate vector ACO_i captures the fixed effects of the ACOs and is also included in E1; and M_i is a vector of market characteristics with the market defined as the county where the patient resides. M_i serves as exclusion restrictions (described further below).

Equation (E2) is estimated jointly with the outcome equation using maximum likelihood estimation. However, to properly adjust for sample selection bias, we retained all beneficiaries aligned with ACOs participating and not participating in the SNF 3-day waiver, who had a SNF stay in one or both years but were not waiver patients and did not meet the criteria to be included in the comparison group. Therefore, we amended equation E1 by adding three mutually exclusive indicator variables (I_i) to identify and control for SNF patients that were not included in the waiver or main comparison group:

$$(E3) \quad Y_i = \alpha_y + \beta_1 w_i + \beta_2 I_i + \beta_3 ACO_i + \beta_4 X_i + \varepsilon_{yi}$$

The three indicator variables added to E3 delineate the following types of patients who used a SNF:

1. Patients included in the “unrestricted” comparison group (discussed above) but not the main comparison group from a prior inpatient hospitalization lasting longer than 3 days.
2. Patients aligned with an ACO participating in the waiver but otherwise not included in the “unrestricted” comparison group.
3. Patients not aligned with an ACO participating in the waiver.

We estimated all models using the *-heckman-* command (for the continuous outcome) and *-heckprobit-* command (for binary outcomes) available in Stata.²⁴ All outcomes were tested and assumed independently normally distributed, and the sample selection model assumes ε_{yi} to be bivariate normal distributed with ε_{si} , or $(\varepsilon_{yi}, \varepsilon_{si}) \sim bivariateN(0,0,1, \sigma_y, \rho)$. If $\rho \neq 0$, then equation (E1) is biased without the sample selection correction.

To simultaneously identify the relationship between variables with outcomes in both equations, we added variables to equation E2 that were excluded from E3. These included certain market characteristics listed in Table 14. Notably, patients in markets with fewer available SNF beds or more alternatives for post-acute care may be more likely to use other types of post-acute care services (e.g., home health, inpatient rehabilitation facility) or receive no post-acute care services at all. These market characteristics are potential determinants of the use of SNF services but are not systematically related to the outcomes of interest once patients are admitted to the SNF.

²³ Cameron CA, Trevedi PK. *Microeconometrics Using Stata*. Stata press, 2009: pp. 541-550.

²⁴ See <http://www.stata.com/manuals13/rheckman.pdf> and <http://www.stata.com/manuals13/rheckprobit.pdf>.

Table 14. Market Characteristics Associated with Use of a SNF in a Given Year (Exclusion Restrictions Included in Equation E2)

Variable	Description	Source
Rural urban continuum	Categorized as Metropolitan (the reference group), Metropolitan-adjacent, Micropolitan, or Rural.	Area Health Resource Files
Number of home health agencies per 100,000 population	Number of Home Health Agencies in the beneficiary's county in 2014 divided by the estimated population of the county in 2014	Area Health Resource Files
Number of SNF beds per 1,000 population	Total number of SNF beds in the beneficiary's county in 2013 divided by the estimated population of the county in 2013	Area Health Resource Files
SNF stays per 1,000 Medicare beneficiaries	Medicare covered stays in a SNF per 1,000 Medicare beneficiaries in the beneficiary's county, in 2014	www.CMS.gov: Medicare Geographic Variation ²⁵
Percent of FFS Beneficiaries using inpatient services	Percent of Medicare FFS beneficiaries in the beneficiary's county that used inpatient services in 2013	Area Health Resource Files
Number of primary care physicians per 1000 population	The total number of MDs or DOs practicing primary care in the beneficiary's county in 2013 divided by the estimated population in the county in 2013	Area Health Resource Files
Medicare Advantage penetration	Percent of Medicare eligible in the beneficiary's county enrolled in Medicare Advantage in 2014	Area Health Resource Files
Percent of population eligible for dual enrollment in Medicare and Medicaid	Number of individuals in the beneficiary's county eligible for dual enrollment in Medicare and Medicaid in 2008 divided by the 2010 Census population of the county	Area Health Resource files
Missing geographic information	Indicator = 1 if beneficiary's county of residence could not be identified and = 0 otherwise. All variables above set to 0 if this indicator is = 1.	N/A

Estimating Equation E2 can also yield insights on the unintended consequence of “overuse” of SNF. For example, we estimated E2 on all non-waiver patients and applied the estimated coefficients to the waiver population to obtain a predicted probability of SNF use for the waiver patients. A lower predicted probability compared to traditional SNF users, may be consistent with “overuse,” though would not be conclusive. “Overuse” implies inappropriate use of the waiver, which this analysis would not determine. However, it would add to the evidence of whether the waiver expanded SNF coverage to patients who would not have otherwise used SNF care.

Methods to calculate the additional impact of waiver associated with selected ACO characteristics

We also examined whether the impact of the waiver differed according to whether the ACO participating in the waiver 1) had prior experience with the SNF 3-day waiver, 2) had a dedicated waiver care coordinator, or 3) required physician oversight of SNF admissions. In other words, this analysis estimated the difference in the marginal effect of the waiver between ACOs with a

²⁵ Accessed at: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Geographic-Variation/GV_PUF.html

given ACO characteristic and ACOs without the given characteristic. To do so, we amend equation (E1) to include three interaction terms, each created by multiplying the indicator for whether the patient used the SNF 3-day waiver, w_i , and an indicator for the ACO characteristic, C_{1-3} . The three interaction terms are not mutually exclusive, since one ACO may feature one or more of the three ACO characteristics. Equation (E4) describes the changes to equation (E1).

$$(E4) \quad Y_i = \alpha_y + \beta_1 w_i + \gamma_1 (w_i \times C_1) + \gamma_2 (w_i \times C_2) + \gamma_3 (w_i \times C_3) + \beta_2 ACO_i + \beta_3 X_i + \varepsilon_{yi}$$

The coefficients γ_1 , γ_2 , and γ_3 represent the difference in the impact of the waiver between patients aligned with participating ACOs with and without characteristics C_1 , C_2 , and C_3 , respectively.



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