Table A1. Narrative summaries of evidence regarding KQ1 and KQ3[[1]](#footnote-2)

| **Author (Year)** | **Intervention** | **Key Question 1**  **Summary of Effect: Utilization** | **Key Question 1 Summary of Effect: Spending/costs** | **Key Question 1**  **Summary of Effect: Quality** | **Key Question 3**  **Summary of Effect** |
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| Abt Associates (1997) | Medicare Cataract Surgery Alternate Payment Demonstration | ▪No reduction of surgical volume or specific services during the demonstration (i.e. diagnostic tests, intra-ocular lens standardization, post-op visits, total visits, YAG capsulotomy).  ▪All providers decreased nd:YAG capsulotomies within 120 days, which may have represented delaying this procedure to receive additional reimbursement.  ▪One provider’s patients exhibited more favorable pre-op characteristics. | ▪In terms of Medicare reimbursement per episode, the Health Care Financing Administration negotiated modest discounts of 2%- 5% (relative to FFS rates) with demonstration providers  ▪Providers at 3 of 4 demo sites reported anecdotal information that costs had been reduced. | ▪There were some anecdotal examples of care redesign, however they cannot be directly attributed to the demonstration.  ▪There were no changes in clinical outcomes (such as visual acuity, complication rates, or change in Snellan lines), which could be attributed to the demonstration. |  |

| Table A1. Narrative summaries of evidence regarding KQ1 and KQ3 (continued) | | | | | |
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| **Author (Year)** | **Intervention** | **Key Question 1**  **Summary of Effect: Utilization** | **Key Question 1 Summary of Effect: Spending/costs** | **Key Question 1**  **Summary of Effect: Quality** | **Key Question 3**  **Summary of Effect** |
| Afendulis  (2011) | Medicare SNF PPS |  |  | ▪No evidence of adverse effects on health outcomes associated with SNF PPS. Mortality decreased by 1.6% (p<.10) under PPS | ▪Total spending growth under SNF PPS was 5.2% lower (p<.05) in high integration areas (integration = degree of integration of hospitals with SNF’s in a market areas)  ▪In more highly-integrated areas under SNF PPS: probability of any SNF spending was 1.2% lower (p<.05); level of SNF spending, conditional on a SNF admission, was 5.3% lower (p<.05); probability of admission to a rehabilitation hospital was 1.2% higher (P<.05); rehab hospital spending, conditional on admission, was 7.4% lower (p<.01); probability of having an outpatient visit was 1.1% higher (p<.10); no statistically significant effect on outpatient spending (conditional on an op visit); no statistically significant effect on use of home health; home health spending was 8.1% lower (p<.10) (conditional on hh use).  ▪No evidence of differential impact on outcomes in high versus low integration areas |
| Anderson (2005) | Medicare Home Health (HH) Prospective Payment System (PPS) | ▪The HH Length of Stay (LOS) was 13.9 days pre-PPS, 11.7 days post-PPS  ▪The number of nurses seen pre-PPS was: 1 nurse (54%), 2 nurses (31%), >=3 (15%); Post-PPS: 1 nurse (45%), 2 nurses (20%), 3 or more (35%). |  | ▪On a scale of 1-10 that measured “how ill” a 5.15 was reported pre-PPS, and a 7.42 post=PPS.  ▪ HH patients requiring hospital readmission in the post-PPS study were somewhat older, sicker, and more complex to manage at the time of discharge. |  |
| Brizioli (1996) | Italy inpatient prospective payment | ▪The LOS decreased from 13.57 days to 11.69 days, a reduction of 13.89% (p<.05). | ▪The cost per discharge declined by 14% post-PPS (p<0.05). | ▪The number of total discharges increased by 10.34% and the number of classified DRG 127 discharges increased by 13.43%; DRG 127 discharges as a proportion of all discharges increased by 2.8%.  ▪There was no significant change in readmission rates within 3 months. | ▪Utilization/ Spending: While reductions in length of stay and cost per case were relatively consistent across age groups, there was a larger increase in re-admissions among patient 70 years of age and older. |
| Buntin (2009) | Balanced Budget Refinement Act of 1999 (in aggregate; implements PPS for HH, Skilled Nursing Facility [SNF], and Inpatient Rehabilitation Facility [IRF]) | ▪Post-acute care (PAC) substitution in response to PPS generally had magnitudes of <1%.  ▪No significant effect on the interaction of patient severity with utilization.  ▪In response to individual SNF and HH PPS implementation, there was a decrease in overall PAC utilization (significant but <1%). In response to IRF PPS implementation, there was an increase in overall utilization (significant but <0.5%). |  |  |  |
| Casale (2007) | Geisinger ProvenCare | ▪There was no change in post-op LOS, but there was a 16% reduction in total LOS; 6.3 Conventional Care Group to 5.3 days ProvenCare Group. | ▪There was a 5% reduction in hospital charges. | ▪There was a 15.5% reduction in 30 day readmission rate (7.1% to 6%).  ▪There was an increase from 59% to 100% adherence for 40 process measures  ▪Discharge to home up from 81% to 90.6% (p=.033)15.5%, from 7.1%  ▪The 19 outcome measures showed no significant differences between control and intervention. |  |
| Cheh  (2001) | Medicare HH PPS Demonstration | ▪PPS site provided 17% fewer visits during 4 month episode during demo; 33% fewer visits in 8 months post-episode; 24% fewer visits during combined one year period | ▪no sig difference in Med A or B reimbursements; no increase in informal caregiving; no increase in formal residential services, possible decrease in use of nursing home care among PPS patients  ▪PPS agencies earned profits by decreasing visits-per-episode, but these appeared to be off-set by increasing overhead costs  ▪PPS reduced Medicare payments to PPS agencies | ▪no evidence of selection  ▪no clinically significant difference in assessed quality of care | ▪high-use agencies (those that historically provided more visits) reduced utilization more quickly than low-use, but the total reduction evened out over time) |
| Chen (2000) | Taiwan inpatient PPS (TPPS) | ▪The LOS was longer in FFS (6.63 +/- 3.21 d FFS, 4.37 +/- 1.47 d TPPS, p<.01);  ▪The mean operation time decreased (97.5 +/- 41.6 min FFS; 75.8 +/- 32.3 min TPPS; p<.01)  ▪Use of general anesthesia decreased (72% FFS – 53.5% TPPS, p<.01); | ▪The total hospital cost, costs for room (35.1%), treatment (33.5), pharmacy (34.3%) and examination (25.3%) [p<.01] and anesthesia (9.2%) [p<.05] all decreased under PPS, costs for operation did not change, total cost decreased by 19.0% under TPPS. | ▪There was no change in the removal or time to removal of stitches.  ▪No differences in frequency of painful incision, clear incision wound on the day of discharge and removal of stitches at hospital (surgical outcomes)  ▪There was also no change in the number of days to resume normal activity. |  |
| Chen (2002) | Medicaid SNF PPS |  | ▪In instrumental variables regression controlling for endogeneity of cost and quality, PPS was not significantly associated with total operating cost in 1994. In regressions not controlling for enodogeneity, PPS significantly negatively associated with cost, suggesting the effect is due to reduced quality. |  |  |
| Coburn (1993) | Maine Medicaid nursing home PPS |  | ▪Total variable costs decreased, patient care costs, and room and board costs decreased three years post-PPS  ▪Regression results indicated no significant association between PPS and decreasing Medicaid share of patients: 80.2% in Y3 (last year before PPS) to 75.9% in Y6 (3rd year of PPS).  ▪About a third of facilities incurred losses by year 3 post-PPS. |  |  |
| Collins (2007) | Medicare SNF PPS | ▪Decrease in LOS (17.4 days to 8.6 days; no p value reported)  ▪Fewer physical therapy visits (10.4 vs 7.2, p=0.041)  ▪No change detected in assistive device (e.g., cane) |  | ▪There was no significant change in knee flexion Range of Motion  ▪About a 40% decrease in knee extension ROM (p=0.035)  ▪ 40% rise in ambulation in feet (p=0.003). |  |
| Cromwell (1998) | Medicare Participating Heart Bypass Center Demonstration | ▪All seven hospitals decreased LOS from 0.5-1 day/yr (Only one hospital had ALOS decrease significantly different from competitor trend.)  ▪”Most” hospitals reduced ICU stays by one day, and routine stays another 2-3 days. | ▪Average Medicare savings was 10%, 86% of which is due to negotiated payment, 5% to decreases in post-discharge care, and 9% to market share  ▪3 of 4 hospitals lowered cost (from 2 to 23% in nominal terms, 18-40% in real cost reduction) ▪Mixed evidence for hospital’s market share ▪Variable Margins increased significantly at two hospitals and decreased (although remaining positive) at two others. (All four had positive variable margins) | ▪There was some evidence of higher patient satisfaction with care in demo hospitals.  ▪No difference in CABG appropriateness.  ▪There was a 2.4% annual increase in rate of reported complications (p<0.1).  ▪Significant improvement trend in inpatient mortality, but trend different from competitors for only 1 hospital.  ▪There was a small positive trend in reported complications.  ▪No systematic differences in self-reported outcomes. |  |
| Davitt (2008) | Medicare HH PPS | ▪The % changes in staffing (n/visits/visits per user) from 1999-2002 were as follows: aides (-21%/-52%/-34%); LPNs and RNs (+16%/-29%/-23%); Therapists (various, not reported here). There was a n:+3.79% in all staff. | ▪Directors report of cost containment actions included: eliminating staff, shifting staff roles, training staff on reimbursement methods, increasing use of telephone monitoring, increasing patient and family education and self-care, and cutting services to patients. |  |  |
| DeJong (2005) | Medicare IRF PPS | ▪There was no significant change in LOS after PPS  ▪Amount of therapy: Decrease in units (physical and occupational) in the most severe CMGs (roughly 20%), increase in units to moderate CMGs (also roughly 20%). |  | ▪No significant change in case-mix (based on FIM).  ▪Facilities took steps to evaluate care processes, particularly at the front and back ends of stays.  ▪There were decreases for admission FIM, discharge FIM, and FIM improvement (between 8% and 15%) for severe CMGs. About a 5% decrease in admission FIM for mild CMGs, and a 35% increase in FIM post-PPS for mild CMGs. | ▪Quality: FIM score improvement declined 15 percent post-PPS for severe CMGs (from 33.3 to 28.2) but dramatically improved for mild CMGs (41 percent, from 14.0 to 19.8). |
| Dobrez (2010) | Medicare IRF PPS | ▪Length of stay was substantially lower for both Medicare (-1.86 days) and (-2.16) non-Medicare fee-for-service patients (both significant with p<0.01). |  | ▪The Discharge motor/cognitive function coefficient (FIM) was -1.1/-0.15 for Medicare FFS patients (p<0.01/p<0.05); there were nonsignificant reductions for patients with all other payers.  ▪The community discharge ratio was 0.87 post-PPS, p<0.01 for Medicare FFS patients; 0.95 and nonsignificant for patients with all other payers. |  |
| Eaton (2005) | Medicare HH PPS | ▪There was a longer LOS post-PPS than pre-PPS (p=.000) Note these are individuals with both a pre and post observation. Also note LOS regression lacks a policy variable to identify post-PPS episodes. |  | ▪The discharge status was questionable; 31.7% discharged to community pre-PPS versus 26.5% post-PPS.  ▪The rates of wound improvement to wound deterioration were also questionable: 6.3% pre-PPS vs. 9.5% post-PPS wound improvement, but 22.3% pre-PPS versus 44.3% post-PPS wound deterioration. |  |
| Ellis (1996) | NH Medicaid IPPS | ▪Overall, a 4.5 day reduction in LOS (14%) for non-elderly, mentally disabled psychiatric patients appears to be attributable to payment system reform; (1.8 days is pure moral hazard effects and 3.0 days is practice style effect). |  |  | ▪Utilization: Changes in Length of Stay, and the portions of those changes that can be attributed to moral hazard effects, selection effects, and practice style effects, all vary by hospital type  ▪Utilization: Length of stay increased for short-stay patients, and decreased for long-stay patients; virtually all change in average length of stay is accounted for by changes in treatment for the longest stay patients |
| Farrar (2009) | England NHS Payment by Results | ▪ LOS fell more quickly in three of four comparisons (3-18 days less per 100 admissions over controls, p<.01)  ▪Proportion of elective care provided as day cases increased more quickly in all comparisons, by 0.4-1.5% more than controls. (p<.01)  ▪Number of spells increased in 3 of 4 comparisons (1.33-4.95% over controls, p<.01). |  | ▪Discharge volume increased for trusts.  ▪Little evidence on clinical outcomes (30 day postsurgical mortality, emergency readmission after treatment for hip fracture). The only significant result was a 2-year decrease in in-hospital mortality of .28 percentage points in one comparison (p<.01). |  |
| FitzGerald (2006) | Medicare HH PPS | ▪Home Health (HH) visits/episode decreased by 10% for joint patients; fell from 20.1 to 18.5 per episode (p<0.0001), 17% decrease for hip patients; dropped from 31.8 to 26.2 per episode post-PPS, larger decrease in for-profit agencies, dual eligible vs. not, and males vs. females.  ▪Probability of HH use declined under IPS, but was relatively flat after implementation of PPS. |  |  | ▪Utilization: Larger (approximately two times as large) declines in visits per episode for for-profit HHAs (in hip fracture and elective joint replacement patients).  ▪Utilization: Larger declines in visits per episode , for dual eligible (for elective joint replacement patients only), and for women (for elective joint replacement patients only).  ▪Utilization:  Slight differences in change in visits per episode across various patient diagnoses |
| FitzGerald (2009) | Medicare HH PPS | ▪During the 120-day episode of care, mean HH visits decreased from 24.0 in 1996 to 14.1 in 2001 (Joint Replacement), 47.1 to 24.3 (Hip Fracture). Regional variation decreased over time.  ▪In terms of the probability of HH selection, the national mean decreased from 0.61 in 1996 to 0.54 in 2001 (JR), 0.44 to 0.39 (HF). Little geographic variation in response. |  |  | ▪Utilization:  Hip fracture patients experienced a slightly larger post-PPS decline in the probability of receiving home health care (5 percent) than elective joint replacement patients (2 percent); hip fracture home health users experienced a larger decline in mean home health visits during a 120-day episode;  ▪Utilization: The impact of bundled payment on probability of home health use and the number of visits also varied by CMS regional office geography. |
| Frymark (2005) | Medicare IRF PPS | ▪The LOS reduced 7 days post-PPS.  ▪Shift towards more speech and language sessions per week: 11% with >5 sessions/wk pre-PPS vs 77% post-PPS. |  | ▪Comprehension of NOMS functional communication measures (FCM): 80% patients made progress post-PPS compared to 67% pre-PPS (p=0.04), otherwise no pre/post differences in improvement ▪Fewer patients achieved multiple levels of functional improvement post-PPS in motor, speech, swallowing, and memory. |  |
| Gillen (2007) | Medicare IRF PPS | ▪ LOS shorter (about 5 days mean difference, p<0.001). Effect still significant when controlling for years of education, time from stroke to assessment, depression score, and cognitive impairment. |  | ▪ Post-PPS patients had higher cognitive impairment and depression (on Geriatric Depression Scale).  ▪More discharges to institutions (rather than home) post-PPS  ▪ Lower discharge FIM (significant) and smaller change in FIM (p<.001) post-PPS. |  |
| Grabowski (2011) | Medicare SNF PPS |  | ▪There was an increase in billing of 4.9%/6.4% for all rehab RUG payment categories, 61.5%/30% for high rehab (SNF placing patients in higher reimbursement codes), DD/DDD specifications, respectively. Only 4.6% increase in “high rehab” categories after controlling for level of payment. | ▪There was a 14.1% increase therapy minutes in DD, and a8.7% increase in DDD. There was only a 0.7% increase after controlling for level of payment.  ▪There was no change post-PPS in DD or DDD specification (discharge within 20 or 90 days). |  |
| Hasegawa (2011) | Japan outpatient hemodialysis bundling | ▪There was no significant change in patients getting rHuEPO  ▪11.8% decrease in EPO dosage (p<.001)  ▪IV iron prescription more likely post-bundling (10% increase), dosage not affected (p<.001) |  |  | ▪Utilization: rHuEPO dosage decreased by 13.9% percent for relatively sicker patients and by 7.4% percent for healthier patients. The percent of relatively sicker and relatively healthier patients receiving IV iron increased by 6.5% percent and 11.3% percent, respectively.  ▪Utilization: private hospitals were more likely to prescribe rHuEPO after reform (by 5.2 percent, compared to no change in the aggregate sample and a negative, insignificant change in private clinics and public hospitals) |
| Hutt (2001) | Medicare SNF PPS Demonstration |  |  | ▪The amount of physical, occupational therapy received per stay by the highest-functioning patients increased in participating sites (19.3 to 26.5 visits per stay, but not in nonparticipating sites.  ▪No association between PPS demo participating and community discharge at 30, 60, and 90 days. | ▪Utilization: Use of physical therapy and occupational therapy increased for the highest functioning patients in PPS facilities, relative to those in non-PPS facilities. There was no significant difference among patients at lower functional levels at admission; Despite increased therapy provision, community residence 60 days after admission did not change for highest functioning patients in PPS facilities. |
| Johnson (1994) | Michigan arthroscopic surgery bundling pilot |  | ▪Reduction in spending of $125,539 compared to estimated payment for same patients under FFS; total payment under bundled payment was $193,000.  ▪Hospital revenue of $96,500 compared to estimated FFS revenue of $84,892 (increase of $11,608).  ▪Surgeon revenue of $96,500 compared to estimated FFS revenue of $51,877 (increase of 42,623). |  |  |
| Konetzka (2004) | Medicare SNF PPS | ▪In terms of professional staffing, the PPS has the strongest negative effect on the sum of RN and LPN hours per patient day, given a mean ratio of 1.2 hours/day, marginal effects of .2–.4 hours translate roughly to a 17–33 percent reduction attributed to PPS. |  | ▪The estimated marginal effect of PPS after the full phase-in is an increase in regulatory deficiencies of .64 per survey, or about a 12 percent increase over the mean number of deficiencies (5.4). The estimated marginal effect that we can attribute to BBRA is a decrease in deficiencies of .18 per survey, or about a 3 percent decrease. | ▪Quality: While no strong pattern of differential staffing was observed between for-profits and nonprofits or between chain and independent facilities, the authors note there is somewhat stronger evidence that hospital-based facilities reacted more strongly than freestanding facilities to PPS and the BBRA rate adjustments; No strong pattern of differential quality effects between for-profits and NFPs or between chain and independent facilities |
| Konetzka (2006a) | Medicare SNF PPS |  |  | ▪The probability of developing a UTI or pressure sore increased among long-stay residents post-PPS. Effects were proportional to the percent of Medicare residents in a facility. A 10% Medicare facility would be expected to have 2.6 more UTIs and 1.1 more pressure sores per quarterly assessment per 100 residents because of PPS. |  |
| Konetzka (2006b) | Medicare SNF PPS |  |  | ▪On average, the change to prospective payment increased the probability that a nursing home resident acquired a stage-2-or-above pressure sore by .0021 and a urinary tract infection by .0020 on any given quarterly assessment; The rate effect variable shows only a marginally significant effect for urinary tract outcomes and is nonsignificant for pressure sores. | ▪Quality: The study examined deficiency differences by facility type (for-profit/non-profit) and market (high-occupancy area/low-occupancy area); although some differential effects were observed, the study reported no consistent, statistically significant differences in overall effect based on these variables; No consistent, statistically significant differences in overall impact on quality measures by facility characteristic. |
| Kulesher (2006) | BBA changes broadly, including Medicare HH PPS and SNF PPS | ▪In Delaware (DE), SNFs per 1000 beneficiaries decreased by 3.8% from 1997-2000 after a 16.4% increase from 1991-1996.  ▪ In DE, there was an increase of 9.4% from 1997-2000 (unk. Base) in SNF LOS days  ▪HH visit/user after a decrease of -5% from 1991-1996. 1997-2000 decreases for NFP SNFs ▪DE: -17.2% decrease from 1997-2000 after 4.7% increase from 1991-1996. | ▪The SNF $ per patient in Delaware increased by 13.3% from 1997-2000 after a 10% increase from 1991-1996  ▪The HH $/ per patient in Delaware decreased 7.9% from 1997-2000 after 9.8% increase from 1991-1996. |  |  |
| Lapane (2004) | Medicare SNF PPS | ▪No change in likelihood in antidepressant use or SSRI post-PPS: (OR, 1.05; 95% CI, .93 – 1.18) or SSRI (OR, .98; 95% CI, .86 – 1.12) being used after PPS (2000 relative to 1997). |  |  |  |
| Lapane (2006) | Medicare SNF PPS | ▪Post-PPS:Pre-PPS Odds Ratio for Rx antiplatelets was 1.21 to 1.37 depending on patient group.  ▪No relationship between PPS and use of anticoagulants for stroke prevention. Increased likelihood of use of antiplatelets post-PPS (OR 1.26, p<0.05). |  |  |  |
| Lin (2005a) | Medicare HH PPS | ▪ Increased use of RN services, home health aide services, and a decrease in physical therapy.  ▪81% of agencies reported increased demands on informal caregivers,  ▪Increases in patients served, visits per patient, length of time patients on service; decreases in length of visit, and number of hospital readmissions.  ▪ 51% of HHAs report employees performing new activities, 53% report increased staff turnover, and 59% report increased use of overtime as a result of PPS. | A survey showed HHA financial position: 64% of HHAs report improvement with PPS relative to IPS (22% worsened, rest undecided). | ▪When measuring administrative burden, approximately two thirds of the agencies indicated that the OASIS added a heavy burden on their resources, whereas one third indicated that it added some burden.  ▪A survey revealed that 84% of HHAs reported staff experienced “increased job-related stress” due to PPS.  ▪30% of HHA respondents reported an increase in number of hospital readmissions. |  |
| Lin (2005b) | Medicare HH PPS | ▪Total HH visits decline 41% and Medicare visits declined 42%, from 1997 to 2001. The HH total users declined 8%, Medicare users declined 12%, from 1997 to 2001. | ▪HHA profit was $511 per non-LUPA episode (reimb-cost) post-PPS  ▪ 40% of HHAs in rural Pennsylvania reported financial vulnerability continued under PPS, but 64% reported financial situation improved with the change from the IPS. |  |  |
| McCue (2006) | Medicare IRF PPS | ▪IRFs sticking with the old cost-based reimbursement system had a greater reduction in LOS (2.33 days) than those that switched to PPS (1.35 days). | ▪No significant difference between groups in Medicare payment per discharge; Smaller growth for PPS group (2.6%) compared to old cost-based group (12.83%) ▪Reduction in operating cost per discharge for PPS group (-5.8%) compared to an increase for cost-based group (0.4%) ▪Operating margin and total profit margin were higher for PPS group (about 12.5% each) compared to cost-based group (about 5% each). | ▪No significant difference between PPS and non-PPS groups in Medicare discharges and total discharges. |  |
| Menke (1998) | Department of Veterans’ Affairs Resource Allocation Methodology (RAM) | ▪Decline in ALOS steepest during Resource Allocation Methodology (RAM) years for 17 of 22 groups; RAM associated with <5 percentage point greater decline in ALOS for medical groups, 4 to 6.5 percentage point greater decline for surgical groups. Larger impact for psychiatric patients. Similar effects on inpatient days per patient. |  | ▪Negligible association between RAM and discharges per patient | ▪Utilization: Reductions in length of stay varied based on patient diagnosis; RAM reduced length of stay relative to comparison payment methods for 17 of 22 diagnoses; the most significant changes were seen among psychiatric diagnoses |
| Murray (2005) | Medicare SNF PPS |  |  | ▪Home discharge planned, family/friend contact, restraint use, history mental illness, can make needs understood, normal vision, motor score, and stroke rates lower post-PPS  ▪Provision of rehab therapy increased (68% to 90%). Largest increases for quintiles with lower predictive scores, amount f therapy decreased (7.1 hrs/wk to 6.2 hrs/wk). |  |
| Murtaugh (2003) | Medicare HH PPS | ▪The average HH visits per user decreased 24% in first year of PPS, from 2000-2001.  ▪The number of users (per 1000 beneficiaries) .decreased by 8% in first year of PPS; from 2000 to 2001. | ▪Payment per HH visit increased by 51% in first year of PPS 2000-2001 (38% adjusted for inflation and change in service mix).  ▪The overall mean annual payment for HH users went up 11%; Ortho: up 41%; Neuro.: up 21%; Diabetes: down 20%; burn/trauma: down 7% ▪HH spending/visit went up from $59.37 in 2000 to $82.18 in 2001 (adjusting for inflation and mix of HH disciplines). |  | ▪Utilization: Payments increased in real terms for some diagnosis categories (by 41 percent for orthopedic diagnoses and 21 percent for neurological diagnoses) and decreased for others (by 18 percent for diabetes diagnoses and 7 percent for burn or trauma diagnoses); Decreases in visits were similar across diagnoses ranging from a 19 percent decrease in orthopedic diagnoses to a 26 percent decrease for diabetes diagnoses. |
| Nayar (2008) | Medicare LTACH PPS | ▪Staffing: From a multivariate regression: 1 additional full-time equivalents per 1000 inpatient days post-PPS. Raw change: +12.42% off base of 9 from 2001-2004. |  |  |  |
| Paddock (2007) | Medicare IRF PPS | ▪There was little change in predicted LOS in pre and post IRF PPS. | ▪In terms of percentage w/ cost above the payment group average, there was a 5.5% reduction post-PPS for all conditions, +DH25, -6% for hip fracture, -4% for lower extremity joint replacement, -5.5% for stroke.  ▪In terms of percentage with LOS above the payment group average, there was an 11% reduction post-PPS for all conditions, -11.5% for hip fracture, -11% for lower extremity joint replacement, and -9.5% for stroke. | ▪There were few major changes in the % with FIM score (motor, cognitive, and total) below payment group average. The largest was a 0.41% decrease in cases with below-average FIM motor score (i.e., an improvement). There was a reduction in patients with high predicted probability of 150-day mortality post PPS. | ▪Spending: A post-PPS reduction in spending per case was larger for hip fracture patients (about 6 percent below predicted spending) than for joint replacement or stroke patients (about 4 percent and 5.5 percent below predicted spending, respectively). |
| Perelman (2007) | Belgian inpatient non-medical PPS | ▪There was a1.49% decrease in LOS attributed to change to non-medical PPS (p<.05). | ▪There was an increase in medical/surgical spending post-PPS (additional 0.8% a year post reform for surgical, 0.5% for medical, both p<.05). |  | ▪Utilization: In the year of the reform average length of stay decreased in high-SES hospitals and increased in low-SES hospitals. In later years, average length of stay decreased in low-SES hospitals and did not change in high-SES hospitals |
| Qu (2011) | Medicare IRF PPS | ▪There was a significant decrease in LOS for Medicare patients (5.8 days/yr) post-PPS, and shorter LOS for non-Medicare patients (1.3 days/yr) post-PPS. |  | ▪Functional improvement FIM (with a motor component) score gains were not significantly different in the pre-PPS and PPS periods. | ▪Utilization: Significantly longer length of stay for only Medicare incomplete tetraplegia patients (p<0.05), and not for incomplete paraplegia, complete paraplegia, or incomplete tetraplegia |
| Rosenthal  (1999) | Case Rate for managed behavioral health care | ▪Visits per episode reduced by 25% under case rate (p<.01)  ▪Patients under case rate more likely to receive meds, be referred for self-help, or referred to a community mental health center |  | ▪No effect of case-rate on probability of single visit episodes (a measure of patient selection)  ▪No effect of case-rate on Global Assessment of Functioning scores | ▪Additional reduction in visits per episode of 22.3% among providers with intensive utilization review (p<.01)  ▪Higher share of FFS revenue increases visits, 34% at 50% FFS revenue compared to no FFS revenue (p<.05) |
| Rosenthal  (2000) | Case Rate for managed behavioral health care | ▪Visits per episode reduced by 20%-25% (depending on model specs) under case rate (p<.05) |  |  | ▪Additional reduction in visits per episode of 22.3% among providers with intensive utilization review (p<.01); ▪Higher share of FFS revenue increases visits, 34% at 50% FFS revenue compared to no FFS revenue (p<.05) |
| Schlenker (2005) | Medicare HH PPS | ▪Significant decrease in HH visits/episode post-PPS (about 3 days aggregated over SN, therapy, and aide after adjusting for HHRG off a base of 18, about a 16.6% decline); Separately, decreases of -1.76 for SN and -1.69 for aide and an increase of 0.45 for therapy.  ▪There was a shift toward higher levels of weight distribution in Home Health Resource Groups in PPS period. |  | ▪Generally, there was improvement in ADLs post-PPS (sig. odds ratios of 1-1.7 for 5 of 7 ADLs and for all three ADL stabilization measures, not significant >1 for one more, and sig. <1 for two more; Mixed results for IADLs, with post-PPS “winners” outpacing losers. ▪Generally modest changes in various clinical outcomes (risk adjusted). | ▪Quality: While results in the stratified analyses were generally similar to the pooled analysis noted above, there were some differential effects, e.g., the measure “stabilization in transferring” was likely to worsen post-PPS for the least dependent patients (odds ratio 0.883, p=0.002) while more dependent patients were more likely to improve post-PPS (odds ratio = 1.631, p<0.001) |
| Shah (2007) | Medicare IRF PPS |  |  | ▪There was an increase in observed patient satisfaction from 60.3 to 63.4% (P < 0.01) after PPS implementation.  ▪Adjusted motor FIM gain decreased (19.5 to 17.9, p<.05); cognitive FIM gain increased (1.4 to 2.9 (p<.05) in all sites after PPS. |  |
| Sood (2008) | Medicare IRF PPS | ▪There was a 3 to 11% decline in LOS post PPS depending on condition and pre-PPS payment limit, all significant, p<0.01. Larger decreases for IRFs with high pre-PPS payment limits. | ▪Average payment per discharge up between 18-23% post-PPS  ▪Marginal payment (estimated): Between 2-9% decrease in costs.  ▪IV: Marginal cost per discharge fell 11% for stroke, 8% for hip, and 7% for joint replacement as a result of lower marginal reimbursement post-PPS.  ▪The elasticity of costs with respect to average reimbursement ranged from 0.26 to 0.34. | ▪Little or no impact of PPS on outcomes such as the rate of return to community 60 days after IRF admission and mortality. |  |
| Stromberg (1997) | Sweden inpatient PPS | ▪ALOS decreased by 42% after PPS (p<0.05). Hospital days post-fracture decreased but were replaced by nursing home days. Total hospital and nursing home days increased by 8% (p<.05). | ▪Total cost for the year after hip fracture increased by 5% despite decrease in orthopedic costs due to increase in post-acute care utilization. | ▪Patients discharged to own home decreased from 56% to 43% while patients discharged to institution increased from 36% to 54%.  ▪Mortality decreased from 8% to 3%. | ▪Spending: Under PPS, inpatient bed-days and costs related to hip fracture increased by 18% and 15% respectively for Stockholm hospitals in general, but decreased by 23% and 15% in a hospital operating a dedicated hip fracture unit. |
| Tsai (2005) | Taiwan’s Bureau of National Health Insurance’s case payment system | ▪After the case payment system was implemented, LOS decreased by 0.59 days (P < 0.0001), the number of minimally required services increased by 2.19 to 4.24 items (P < 0.0001), the number of optional service items decreased by 0.32 items (P < 0.0001), and drug prescription decreased slightly by 0.58 to 0.99 items (P < 0.0001) per hospitalization.  ▪23.74% increase in surgeries post-case payment (descriptive stat). |  |  | ▪Utilization: Average length of stay decreased by 0.59 days, 0.67 days, and 0.83 days at medical centers, district hospitals, and regional hospitals, respectively. |
| Vos (2010) | Netherlands inpatient prospective payment |  |  | ▪81% of hospitals undertook projects to establish care programs; 33% of care delivery was organized in care programs; 75.4% of hospitals appointed process owners.  ▪93.5% of hospitals have clinical protocols for specific diseases; 75% have organizational protocols for routing patients. |  |
| Wen (2008) | Taiwan hospital case payment | ▪LOS yielded a 0.6 day decrease in first year, additional 0.26 day decrease in second year relative to FFS period, ▪Summary: decrease in 0.15 outpatient visits by year 2 after smaller increase in year 1 post-PPS. | ▪Decrease of 2% in first year for log inpatient $, unclear on incremental decrease in second year  ▪Decrease of 7% in first year for log x-ray $, additional decrease in second year  ▪Increase of 4% in first year for log lab test $, decrease in second years. | ▪The total inpatient and outpatient claims decreased 2% in the first year of CP, and 12% in the second year, relative to pre-CP, ▪The number of diagnoses at intake increased indicating more unhealthy patients (p<.01). |  |
| White (2003) | Medicare SNF PPS | ▪ALOS in SNF decreased from 23.8 in 1997 to 22.9 in 2000 | ▪The average SNF rehabilitation charge per hospital stay decreased 44.6% (from $421) between 1997 and 2000; largest decrease for for-profit freestanding SNFs, less dramatic decrease for NFP SNFs, and small increase in charges for hospital-based SNFs  ▪The distribution in patients by charges shifted in patients with >$200 charges, from 19% in 1997 to 1.6% in 2000 for for-profit SNFs. Less dramatic decrease for NFP SNFs. | ▪The probability of being discharged to a SNF following a hospital stay decreased from 16.3% in 1997 to 14.7% in 2000; total SNF days decreased from 42.0 M in 1997 to 36.9 M in 2000. | ▪Spending: A significant decline in rehabilitation charges per stay for for-profit, freestanding SNFs was offset by smaller decline for not-for-profit SNFs and a small increase in charges for hospital-based SNFs. |
| White (2005) | Medicare SNF PPS | ▪PPS effect has strong negative associated with nurse staffing, smaller effect among nonprofit. Average effect is decrease of 13 minutes of nurse time per day. | ▪In terms of staffing, there was a significant decrease in costs spent on all nurse types (CNA, LPN, RN, total). | ▪There was no consistent or significant effect on the quality of care (i.e., “deficiencies,” pressure sores, use of restraints). |  |
| Wodchis (2004a) | Medicare SNF PPS |  |  | ▪Medicare beneficiaries more likely to be discharged to home post-PPS, but non-Medicare residents had an even better improvement.  ▪The relative risk for discharge to death was 0.81 (p<0.001) for Medicare beneficiaries post-PPS, but overall higher relative risk (1.58) for Medicare beneficiaries (gap shrunk, but still there). |  |
| Wodchis (2004b) | Medicare SNF PPS |  |  | ▪There was an increased probability of any rehab therapy (3% increase), decreased therapy time (4% average expected rehab time) post-PPS.  ▪12 percentage point increase in the probability of therapy time at one of these nodes post-PPS (45, 150, 325, 500, and 720 mins of therapy). |  |
| Yip (2002) | Medicare SNF PPS |  |  | ▪Post-PPS patients had lower physical functioning score (10.52 vs. 20.10) and physical summary scores (24.11 vs. 26.52) and higher role emotional scores (68.44 vs. 55.83)  ▪Patients received 5 less physical therapy days under PPS (18.53 to 13.09 days), patients received 46.6% of physical therapy and 54.4% of occupational therapy (in minutes) under PPS compared to before. |  |
| Zhang (2008) | Medicare SNF PPS |  |  | ▪After acuity and quality adjustment, there was a gradual decline in efficiency from a mean of 0.198 in 1997 to 0.131 in 2003 (resident days over operational expenses). BBA, BBRA, and BIPA each decreased efficiency between 1 and 2/100’s of a point. Other factors important (e.g., HHI). |  |
| Zinn (2008) | Medicare SNF PPS | Medicaid case mix index and Medicare PPS increased administrative nurse staffing by, on average, 5.5% and 4.0%, respectively. ▪Complementary with direct care staffing: increase in total direct care nurse staffing by 0.5 hrs. per day associated with 12% increase in admin nurse hrs. per day. |  |  | ▪Utilization: “Medium” SNFs (between 100 and 199 beds) and “large” SNFs (200 or more beds) had about 5 percent higher administrative nurse staffing post-PPS compared to “small” SNFs (fewer than 100 beds). The study reported no differences in administrative nursing levels between chain and non-chain SNFs and for-profit vs. not-for-profit SNFs. |

1. 2 KQ2 is omitted as there was no evidence to report. [↑](#footnote-ref-2)