

Impact of Primary Rehabilitation Payor on Inpatient Rehabilitation Facility Length of Stay for Patients Enrolled in the Traumatic Brain Injury Model System – 2010-2017

Michael Chiou, MD & Kirk Lercher, MD

Department of Rehabilitation and Human Performance, Icahn School of Medicine at Mount Sinai, New York, NY

INTRODUCTION

Brain injury clinicians continue to face increasing pressures to reduce length of stay. We previously reported that inpatient rehabilitation facility length of stay (IRF-LOS) declined from 27 days to 23 days between 2010 and 2017 and that continued decreases in length of stay may diminish the ability for brain injury medicine clinicians to admit and care for a growing population of complex rehabilitation patients.[1] It continues to be unknown how short IRF-LOS can become before patients living with traumatic brain injury (TBI) suffer negative outcomes, which ultimately results in higher healthcare costs.

There are a variety of rehabilitation payors for inpatient rehabilitation. These include Medicare, Medicaid, workers' compensation, commercial insurance, private pay, state crippled children's, no fault insurance, a free bed at the hospital, and Medicaid pending. As one might expect, Medicare, Medicaid, and commercial insurance are, by and large, the most common rehabilitation payors. The impact of third-party payors, including the Centers for Medicare & Medicaid Services (CMS), should not be understated [2,3,4]. These entities aim to decrease overall healthcare costs. At inpatient rehabilitation facilities, this is achieved by decreasing allowable IRF-LOS.

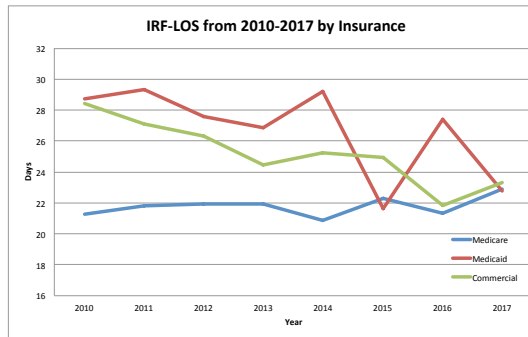
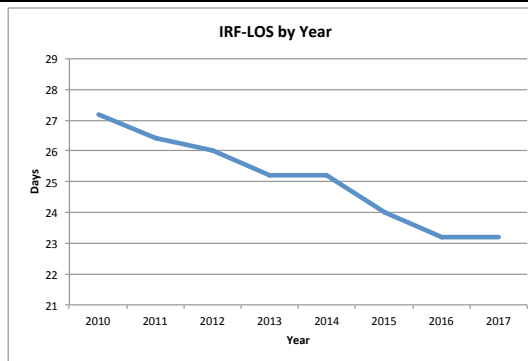
This study is designed to explore trends in inpatient rehabilitation facility length of stay (IRF-LOS) and investigate the impact of primary rehabilitation payor on IRF-LOS. This study is primarily exploratory in nature using existing data from the National TBI Model System Database. The objectives of the study are to explore trends in IRF-LOS and investigate the impact of primary rehabilitation payor on IRF-LOS.

METHODS

This study uses existing data from the National TBI Model System Database. Two sources of data were collected from the patient sample: (1) Form I includes data collected at time of admission and discharge from an inpatient rehabilitation facility and (2) Form II is collected at various anniversaries throughout the lifespan of each patient. This study uses patient IRF-LOS and rehabilitation payor data from Form I.

This is a retrospective study of 7,079 individuals enrolled in the TBI Model System between 2010 and 2017. The criterion for inclusion was a rehabilitation payor of Medicare, Medicaid, and/or commercial insurance. The criterion for exclusion from the study was a rehabilitation payor of workers' compensation, private pay, state crippled children's, no fault insurance, a free bed at the hospital, Medicaid pending, or unknown. The National TBI Model System Database includes sections entitled RehabPay1 and RehabPay2 for rehabilitation payor 1 and rehabilitation payor 2, respectively, and there is a subset of patients with dual coverage. For patients with concurrent Medicare and either Medicaid or commercial insurance, Medicare was considered as the primary rehabilitation payor. For patients with concurrent Medicaid and commercial insurance, commercial insurance was considered as the primary rehabilitation payor.

RESULTS



Inpatient Rehabilitation Facility Length of Stay from 2010-2017 by Insurance

Year	2010	2011	2012	2013	2014	2015	2016	2017	Total
Average IRF-LOS (in days)									
Medicare	21.3	21.8	21.9	22.0	20.9	22.3	21.3	22.9	21.8
Medicaid	28.7	29.3	27.6	26.8	29.2	21.6	27.4	22.8	26.7
Commercial	28.4	27.1	26.3	24.4	25.3	25.0	21.8	23.3	25.1

Abbreviations: Inpatient Rehabilitation Facility Length of Stay (IRF-LOS)

DISCUSSION

Inpatient rehabilitation facility length of stay declined from 27 days to 23 days between 2010 and 2017. During this period, for patients with Medicare as the primary rehabilitation payor, IRF-LOS increased from 21.3 days to 22.9 days; for those with commercial insurance, it decreased from 28.4 to 23.3 days; and for those with Medicaid, it decreased from 28.7 to 22.8 days. Medicare IRF-LOS showed the least variability with an increase of 7%, whereas commercial insurance IRF-LOS decreased by almost 18% from 2010 to 2017.

The observed shorter IRF-LOS for patients with Medicare as a primary rehabilitation payor (compared to Medicaid or commercial) may be explained by the use of a Prospective Payment System (PPS) based on a classification system centered around a patient's diagnosis, impairment, and comorbidities [4]. The upward trend in IRF-LOS for patients with Medicare may be explained by increased medical complexity of patients admitted to IPR in recent years or perhaps other external factors (e.g. healthcare policy) and would benefit from further exploration. The observed dip in IRF-LOS for patients with Medicaid in 2015 may be explained by changes in Medicaid policy, though this outlier requires further exploration.

It should be noted that TBI Model System data does not differentiate between straight and managed Medicare, an area to be further studied that could provide valuable insight. In some regards, managed Medicare functions similar to commercial insurance, where a third party payor actively "participates" in the evaluation of a patient's rehabilitation progress to determine whether continued functional gains or plateaus facilitate prolonged IRF-LOS or prompt discharge, respectively. Further studies should also explore the impact of third-party payors on patient access to post-discharge supplies including durable medical equipment, transportation, and home nursing care, all of which may play a critical role in discharging a patient from an inpatient rehabilitation facility to home.

CONCLUSION

This retrospective observational study suggests that primary rehabilitation payor may play a significant role in IRF-LOS. It is known that continued decreases in length of stay diminish the ability for brain injury medicine clinicians to admit and care for a growing population of complex rehabilitation patients. With the current information in hand, clinicians and rehabilitation care teams may better be able inform patients about length of stay expectations based on the patient's primary rehabilitation payor, while continuing to advocate for discharge from an inpatient rehabilitation facility to home to occur at the point when a patient's functional and education gains plateau.

REFERENCES

- Chiou M, Lercher K. (Nov 2020). Acute Inpatient Rehabilitation Length of Stay and Outcomes for Patients Enrolled in the Traumatic Brain Injury Model System – 2010-2017. APMR Annual Assembly, Virtual.
- Chan L, Kogstad TD, Deyo RA, et al. The effect of Medicare's payment system for rehabilitation hospitals on length of stay, charges, and total payments. *N Engl J Med.* 1997;337(4):376-385.
- Chan L, Gid M. Medicare's payment system: its effect on discharges to skilled nursing facilities from rehabilitation hospitals. *Arch Phys Med Rehabil.* 2000;81(6):715-719.
- Hoffman JM, Donovan Brown EJ, Chan L, Dikens S, Tomkin N, Bell KR. Change in inpatient rehabilitation admissions for individuals with traumatic brain injury after implementation of the Medicare inpatient rehabilitation facility prospective payment system. *Arch Phys Med Rehabil.* 2012;93(9):1595-1512.

