
Tina M. Suess, John W. Beard, Michael Ripschinski, Matthew Eberts, Kevin Patrick, Leo J. Tharpe
Penn Medicine Lancaster General Health, CRI Medical, Inc, Biogenie, Pvt. Ltd

Background

- Smart pump-electronic health record (EHR) interoperability has been demonstrated to reduce adverse events and increase documentation and billing accuracy.1-2
- Relatively little is known about the impact of interoperability on infusion therapy billing claims and hospital finances.

Purpose


Methods

- Retrospective cohort study approved by the Institutional Review Board
- Data were analyzed from patients admitted to Penn Medicine Lancaster General Health who received IV infusions and for whom CPT® coded infusion-therapy billing claims were submitted.
- Data was collected for patients in the emergency department (ED) and in non-ED units (e.g., oncology, neurosciences, cardiac telemetry, etc.).
- A "patient event" is defined as an ED visit or a non-ED unit admission day. The intervention was defined as the use of smart pump-EHR interoperability to auto-document infusion-therapy start and stop times.
- The primary outcome of the study was the total count of all CPT® code submissions for ED versus non-ED.
- The secondary outcome included the individual CPT® codes
- Data were analyzed from patients admitted to Penn Medicine Lancaster General Health who received IV infusions and for whom CPT®-coded infusion-therapy billing claims were submitted.

Results

- The findings from this study suggest value of smart pump-EHR interoperability and extend the benefits beyond patient safety to include improved hospital financial performance through charge capture and billing compliance.
- CPT® code submission count was higher among patients who had auto-documentation of infusion start and stop times and ED submissions were higher than non-ED submissions. Gains demonstrated across units and by admission status suggest these effects may be generalizable to the broad hospital population.
- The net hospital revenue associated with these codes is subject to a highly complex analysis of payer mix, reimbursement contracts, etc. and is beyond the scope of this study.
- These community hospital results may help drive adoption of smart pump-EHR interoperability by providing critical financial considerations.
- Further study is required to confirm and evaluate the implications of these results.

Discussion for further study

- Trend of interoperability driven billing improvements over time.
- Financial results of conversion from total manual documentation to auto-documentation of start and stop times.
- Impact of interoperability on documentation of therapies not delivered by the infusion pump.

Conclusions

- This is the first study to document the positive impact of interoperability on CPT® coded infusion therapy billing claims.
- The findings from this study suggest value of smart pump-EHR interoperability and extend the benefits beyond patient safety to include improved hospital financial performance through charge capture and billing compliance.
- CPT® code submission count was higher among patients who had auto-documentation of infusion start and stop times and ED submissions were higher than non-ED submissions.
- The annualized increase in value of the corresponding 2017 Medicare Addendum B rates was $1,147,652.
- When divided by study groups, the ED had a $478,980 increase, while ED units had an increase of $668,672 in claims.
- Viewed by admission status, claims increased by $610,712 for outpatients and $536,940 for inpatients.
- Gains demonstrated across units and by admission status suggest these effects may be generalizable to the broad hospital population.
- The net hospital revenue associated with these codes is subject to a highly complex analysis of payer mix, reimbursement contracts, etc. and is beyond the scope of this study.
- These community hospital results may help drive adoption of smart pump-EHR interoperability by providing critical financial considerations.
- Further study is required to confirm and evaluate the implications of these results.

Fig. 1 Overall patient events

Fig. 2 Overall billed therapies

Fig. 3 Overall impact (ED plus non-ED) 2017 Medicare Addendum B dollar amounts by CPT® billing code

Fig. 4 Financial impact (ED plus non-ED) 2017 Medicare Addendum B dollar amounts by CPT® billing code

Fig. 5 Comparison of 2016 and 2017 billed therapies for ED by CPT® code

Fig. 6 Comparison of 2016 and 2017 billed therapies for non-ED by CPT® code

Table 1 ED versus non-ED, 2017 Medicare Addendum B annual dollar amount change by CPT® code

Table 2 Overall billing impact for IPs and OPs

Notes


Disclosures

- John Beard is an employee and a shareholder of ICU Medical Inc.
- These authors (Michael Ripschinski, Matthew Eberts, and Kevin Patrick) have not received personal compensation for their roles in this study.
- Tina M. Suess, John W. Beard, Michael Ripschinski, Matthew Eberts, Kevin Patrick, and Leo J. Tharpe have not received personal compensation for their roles in this study.
- This study was supported by Sprout Biotech, LLC, with data analysis performed independently for this study within Sprout Biotech, LLC.
- John Beard is an employee and a shareholder of ICU Medical Inc.
- These authors (Michael Ripschinski, Matthew Eberts, and Kevin Patrick) have not received personal compensation for their roles in this study.
- Tina M. Suess, John W. Beard, Michael Ripschinski, Matthew Eberts, Kevin Patrick, and Leo J. Tharpe have not received personal compensation for their roles in this study.