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About the Health Information Technology Survey

The Rhode Island Department of Health (RIDOH) has administered the Health Information Technology (HIT) Survey to all licensed physicians in Rhode Island since 2009. Starting in 2013, RIDOH expanded the HIT Survey to include all licensed advanced practice registered nurses (APRNs) and physician assistants (PAs).

The HIT Survey examines the distribution and use of health information technology, such as electronic health records (EHRs), in Rhode Island. Though EHRs are associated with beneficial outcomes, they have also been reported to reduce the quality of the clinician-patient interaction.

Over the past ten years, the RIDOH HIT Survey has assessed and monitored changes in the proportion of clinicians with access to EHRs and who transmit prescriptions electronically, or e-prescribe. Additionally, the RIDOH HIT Survey explores the impact of technological advancements and federal legislation on HIT adoption and clinician workflow.

The 2019 HIT Survey includes several new topics:

- Useful personal and practice strategies for improving their experience with HIT
- Useful strategies for improving patient and clinician communication
- Patient generated data
- Time spent managing EHR inbox

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Physician Summary Measures

The 2019 Physician Health Information Technology (HIT) Survey was administered to 4,266 physicians licensed in Rhode Island, in active practice, and located in Rhode Island, Connecticut, or Massachusetts. The survey received a total of 1,835 responses for a response rate of 43.0%.

To describe the prevalence, use, and impact of HIT among physicians in Rhode Island, we report four composite measures:

1. physicians with electronic health records (EHRs)
2. physicians who e-prescribe
3. physicians who e-prescribe controlled substances, and
4. physicians who experience HIT-related stress.

Aggregate results for these measures are in Table 1 (page 5). Please refer to the measure specifications document for a description of how the measures were calculated and the practitioner level report for individual physician results. The practitioner-level report does not include an individual-level measure of HIT-related stress.

Table 2 (page 5) stratifies the four publicly-reported EHR summary measures by practice setting (office versus hospital) and, among office-based physicians, by specialty (primary care physician [PCP] versus non-PCP).

Figure 1 (page 6) compares this year’s EHR and e-prescribing results to data from prior survey years. Figure 2 (page 6) shows the survey response rate from 2009 to 2019.
Table 1. Publicly-reported measures for the physician respondents

<table>
<thead>
<tr>
<th>Measure</th>
<th>Respondents</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians with EHRs&lt;sup&gt;5&lt;/sup&gt;</td>
<td>1,835</td>
<td>1,697 (92.5%)</td>
</tr>
<tr>
<td>Physicians who e-prescribe&lt;sup&gt;6&lt;/sup&gt;</td>
<td>1,598</td>
<td>1,344 (84.1%)</td>
</tr>
<tr>
<td>Physicians who e-prescribe controlled substances&lt;sup&gt;7&lt;/sup&gt;</td>
<td>1,381</td>
<td>565 (40.9%)</td>
</tr>
<tr>
<td>Physicians experiencing HIT-related stress&lt;sup&gt;8&lt;/sup&gt;</td>
<td>1,652</td>
<td>1,337 (80.9%)</td>
</tr>
</tbody>
</table>

Table 2. Physician publicly-reported measures, by practice setting and office-based specialty<sup>9</sup>

<table>
<thead>
<tr>
<th>Measure</th>
<th>Setting</th>
<th>Office-based specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Office (N=1,216)</td>
<td>Hospital (N=619)</td>
</tr>
<tr>
<td>Physicians with EHRs, n (%)&lt;sup&gt;5&lt;/sup&gt;</td>
<td>1,096 (90.1%)</td>
<td>601 (97.1%)</td>
</tr>
<tr>
<td>Physicians who e-prescribe, n (%)&lt;sup&gt;6&lt;/sup&gt;</td>
<td>1,021 (87.0%)</td>
<td>323 (76.0%)</td>
</tr>
<tr>
<td>Physicians who e-prescribe controlled substances, n (%)&lt;sup&gt;7&lt;/sup&gt;</td>
<td>432 (42.8%)</td>
<td>133 (35.9%)</td>
</tr>
<tr>
<td>Physicians experiencing HIT-related stress, n (%)&lt;sup&gt;8&lt;/sup&gt;</td>
<td>901 (84.6%)</td>
<td>436 (74.3%)</td>
</tr>
</tbody>
</table>

<sup>5</sup> EHR was defined in the survey as an integrated electronic clinical information system that tracks patient health data and may include such functions as visit notes, prescriptions, lab orders, etc.

<sup>6</sup> Excludes physicians who responded that prescribing was not applicable to their practice.

<sup>7</sup> Excludes physicians who responded that they do not prescribe medications or that they do not prescribe any controlled substances.

<sup>8</sup> HIT-related stress was considered present if the respondent indicated one or more of the following: 1) agree/strongly agree that EHRs add to the frustration of their day, 2) moderately high/excessive use of the EHR at home, and 3) poor/marginal time for documentation. This measure is not reported at the individual clinician level.

<sup>9</sup> The denominator for each measure is the number of respondents for the specific associated survey question, which may be less than the number of total survey respondents (N) at the top of the column.
The prevalence of EHRs has increased from 68% in 2009 to 93% in 2019, but uptake has leveled off in recent years. E-prescribing follows a similar pattern.

In recent survey years, the HIT Survey has had a lower response rate. This reduced rate may be due, in part, to transitioning to biennial administration after the 2015 survey.

10 The HIT survey was not conducted in 2016 & 2018
EHR Functionalities & EHR Vendors

Although the majority of physicians in Rhode Island now use electronic health records (EHRs), the format and functionality of these products can differ significantly. Two functions of particular interest are clinical decision support and interoperability. When used as intended, these functions can improve the delivery of care and enable better workflows.

Clinical decision support tools
Clinical decision support provides clinicians with person-specific information at appropriate times to enhance care. Among physician respondents, most physicians use EHR drug allergy or interaction warnings at the point of prescribing (86.4% of office-based physicians and 85.1% of hospital-based physicians, see Figure 3 & Figure 4, page 8). Over half of both office-based and hospital-based physicians use EHR notifications of whether a specific drug is included in the formulary. The third decision support tool—using prompts at the point of care regarding care specific to the patient—was used by the lowest proportion of physicians in each setting.

Interoperability
HIT interoperability enables the secure exchange of electronic health information with other forms of health information technology. A higher proportion of office-based physician respondents were aware of their EHR’s interoperability functions, compared to hospital-based physicians (Figure 5, page 9 & Figure 6, page 10). Just under half of both office-based clinicians (46.8%) and hospital-based clinicians (49.1%) reported using interoperability functionality to access other health systems’ lab results from within the EHR. Less than a third of physicians reported having access to data from the Rhode Island Department of Health’s Prescription Drug Monitoring Program (PDMP) directly in their EHR (24.1% of office-based physicians and 29.8% of hospital-based physicians).

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Figure 3. Percent of office-based physicians who have and use the following EHR decision support functions (N=1,068)

- Prompts at the point of care, regarding recommended care specific to patient: 52.2% have and use, 13.7% have but do not use, 29.6% don't have, 18.2% don't know.
- Drug allergy or interaction warnings at the point of prescribing: 86.4% have and use, 4.1% have but do not use, 4.6% don't have, 4.9% don't know.
- Notification of whether a specific drug is included in formulary: 63.7% have and use, 10.7% have but do not use, 20.1% don't have, 16.2% don't know.

Figure 4. Percent of hospital-based physicians who have and use the following EHR decision support functions (N=558)

- Prompts at the point of care, regarding recommended care specific to patient: 62.3% have and use, 13.0% have but do not use, 19.0% don't have, 18.8% don't know.
- Drug allergy or interaction warnings at the point of prescribing: 88.5% have and use, 3.4% have but do not use, 5.0% don't have, 6.5% don't know.
- Notification of whether a specific drug is included in formulary: 66.7% have and use, 5.5% have but do not use, 61.2% don't have, 22.5% don't know.
Figure 5. Percent of office-based physicians who have and use the following EHR interoperability functions (N=1,074)
Figure 6. Percent of hospital-based physicians who have and use the following EHR interoperability functions (N=579)
Just over half of physicians use one EHR system or vendor. About a quarter of physicians use two different systems or vendors across their practice sites (Figure 7). Epic Systems is the most frequently used EHR vendor, with the majority of hospital-based physicians (57.6%) and a quarter of office-based respondents (26.0%) using this system (Figure 8).

Most hospital-based physicians use one of four vendors: Epic Systems, Cerner – Powerchart (17.1%), MEDITECH (8.0%), and CPRS/Vista (4.0%). While there is more variation in vendors among office-based physicians than hospital-based physicians, over half use one of three vendors: Epic Systems, eClinicalWorks (20.4%), or Athenahealth (9.4%).

Figure 8. Percent of physicians who use the following EHR vendors, for the vendors with at least 20 respondents, by practice setting
E-Prescribing Practices & Use of the Prescription Drug Monitoring Program

Electronic prescribing, or e-prescribing, is a computerized framework that allows clinicians to send prescriptions electronically to participating pharmacies, instead of by fax or paper delivery.\textsuperscript{13} E-prescriptions tend to be more accurate and legible, possibly reducing errors.\textsuperscript{14} The Centers for Medicare & Medicaid Services (CMS) state that e-prescribing “is an important element in improving the quality of patient care.”\textsuperscript{13}

The Health Information Technology (HIT) Survey measured the use of e-prescribing among Rhode Island physicians. Figure 9 shows how often physicians transmit prescriptions electronically to the pharmacy. Hospital-based physicians were asked only to consider outside or community-based pharmacies and not the hospital pharmacy.

The majority (59.2%) of office-based physicians who prescribe medications report that they “always” transmit prescriptions electronically to the pharmacy. Among hospital-based physicians who prescribe medications, 28.4% “always” transmit prescriptions electronically to an outside or community pharmacy.

Figure 9. Among physician respondents who prescribe medications, the percent who transmit prescriptions electronically to the pharmacy

<table>
<thead>
<tr>
<th></th>
<th>Office-Based (N=1,168)</th>
<th>Hospital-Based (N=419)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>59.2%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Often</td>
<td>23.2%</td>
<td>29.8%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>5.1%</td>
<td>18.4%</td>
</tr>
<tr>
<td>System can electronically transmit prescriptions, but I do not use this functionality</td>
<td>3.0%</td>
<td>10.3%</td>
</tr>
<tr>
<td>System cannot electronically transmit prescriptions</td>
<td>9.4%</td>
<td>13.1%</td>
</tr>
</tbody>
</table>


\textsuperscript{14} Porterfield, A., K. Engelbert, and A. Coustasse, Electronic prescribing: improving the efficiency and accuracy of prescribing in the ambulatory care setting. Perspect Health Inf Manag. 11: p. 1g.
The 2019 HIT Survey also assessed the e-prescription of controlled substances. Controlled substances are medications categorized under the Controlled Substances Act (CSA) by their risk for abuse and risk of dependence when abused. Opioids and benzodiazepines are examples of controlled substances. Rhode Island passed a law that takes effect on January 2, 2020, requiring the e-prescribing of all controlled substances. Half of the physician respondents (50.4%) were unaware of this law when surveyed in May of 2019.

Figure 10 shows the percent of physicians who transmit controlled substance prescriptions electronically. This figure only includes those physicians who prescribe controlled substances and are able to e-prescribe medications. Hospital-based physicians answered about their ability to electronically transmit controlled substance prescriptions to an outside or community-based pharmacy. Less than half of office- and hospital-based physicians who e-prescribe medications report electronically transmitting controlled substance prescriptions.

As of May 2019, 40.9% of physicians who prescribe controlled substances send the prescriptions electronically.

A RI law requiring the e-prescription of all controlled substances in goes into effect January 2, 2020.

Figure 10. Among the physicians who e-prescribe medications and prescribe controlled substances, the respondents who e-prescribe controlled substances, by practice setting

- **Always**
  - Office-Based (N=909): 29.3%
  - Hospital-Based (N=291): 16.8%

- **Often**
  - Office-Based (N=909): 11.9%
  - Hospital-Based (N=291): 10.7%

- **Sometimes**
  - Office-Based (N=909): 7.0%
  - Hospital-Based (N=291): 18.2%

- **System can electronically transmit controlled substance prescriptions, but do not use this functionality**
  - Office-Based (N=909): 14.6%
  - Hospital-Based (N=291): 19.6%

- **System cannot electronically transmit controlled substance prescriptions**
  - Office-Based (N=909): 37.2%
  - Hospital-Based (N=291): 34.7%
Among both hospital- and office-based physicians, the most frequently reported barrier to e-prescribing controlled substances was a lack of EHR capability, followed by a personal preference for paper prescriptions. (Figure 11) Those who responded that there were “other” barriers mostly reported that their practice either hadn’t adopted or was in the process of implementing the functionality to e-prescribe controlled substances.

**Figure 11.** Among physician respondents who prescribe controlled substances, but who are unable to transmit the prescriptions electronically, the barriers to e-prescribing controlled substances, by practice setting (respondents were allowed to select more than one)

- **Computer system is not capable**
  - Office-Based (N=466): 36.2%
  - Hospital-Based (N=130): 29.0%

- **I prefer paper prescriptions**
  - Office-Based (N=466): 36.2%
  - Hospital-Based (N=130): 26.8%

- **Pharmacy requires paper copies of these prescriptions**
  - Office-Based (N=466): 22.3%
  - Hospital-Based (N=130): 20.2%

- **Did not know that this was legal in Rhode Island**
  - Office-Based (N=466): 23.8%
  - Hospital-Based (N=130): 15.9%

- **Too few prescriptions to make it worth while**
  - Office-Based (N=466): 10.8%
  - Hospital-Based (N=130): 14.2%

- **Computer system is too expensive**
  - Office-Based (N=466): 5.4%
  - Hospital-Based (N=130): 11.6%

- **Computer system is too complicated**
  - Office-Based (N=466): 9.2%
  - Hospital-Based (N=130): 10.5%

- **Patients prefer paper prescriptions**
  - Office-Based (N=466): 5.4%
  - Hospital-Based (N=130): 1.9%

- **Other**
  - Office-Based (N=466): 27.6%
  - Hospital-Based (N=130): 18.0%
**Figure 12** shows the percent of office-based physicians who consult the Prescription Drug Monitoring Program (PDMP) in four different clinical scenarios. Office-based physicians report consulting the PDMP more often for new patients than for established patients. Three quarters (76.5%) report consulting the PDMP for new patients when prescribing a new or refill prescription for an opioid or a benzodiazepine. For an established patient, 65.2% report consulting the PDMP for a new prescription and 54.0% for a refill.

**Figure 13 (page 16)** shows how often hospital-based physicians consult the PDMP when prescribing controlled substances intended for use outside of their hospital or facility. About a third (31.8%) of hospital-based physicians report “always” consulting the PDMP before prescribing opioids or benzodiazepines.

When asked if they check the Rhode Island PDMP for reasons other than writing a prescription (e.g., to learn more about the care patients are receiving from other clinicians), 38.8% of office-based physicians and 31.9% of hospital-based physicians reported that they did.

**Figure 14 (page 16)** shows the barriers to using the RI PDMP. Among both hospital- and office-based physicians, the most frequently reported barrier was the separate login to access the system.

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**Figure 12. Among office-based physician respondents who prescribe controlled substances, the percent who consult the Rhode Island PDMP before prescribing opioids or benzodiazepines in the following situations (N = 784)**

- **A NEW prescription for a NEW patient**
  - Use the PDMP in more than half of these situations: 76.5%
  - Use the PDMP in fewer than half of these situations: 12.7%
  - Do not use the PDMP in these situations: 10.8%

- **A NEW prescription for an ESTABLISHED patient**
  - Use the PDMP in more than half of these situations: 65.2%
  - Use the PDMP in fewer than half of these situations: 21.6%
  - Do not use the PDMP in these situations: 13.3%

- **A REFILL prescription for a NEW patient**
  - Use the PDMP in more than half of these situations: 76.5%
  - Use the PDMP in fewer than half of these situations: 13.7%
  - Do not use the PDMP in these situations: 9.8%

- **A REFILL prescription for an ESTABLISHED patient**
  - Use the PDMP in more than half of these situations: 54.0%
  - Use the PDMP in fewer than half of these situations: 31.9%
  - Do not use the PDMP in these situations: 14.1%
Figure 13. Among hospital-based physician respondents who prescribe controlled substances, the percent who consult the Rhode Island PDMP before prescribing opioids or benzodiazepines* (N=333)

*Physicians were asked to consider only opioid and benzodiazepine prescriptions intended for use outside the hospital or facility

Figure 14. Among physician respondents, the barriers to using the Rhode Island PDMP, by practice setting (respondents were allowed to select more than one)

- There is a separate login: 45.5% Office-Based, 51.8% Hospital-Based
- Time consuming/slow: 33.2% Office-Based, 42.4% Hospital-Based
- It interrupts workflow: 26.9% Office-Based, 33.2% Hospital-Based
- Rarely prescribe the medications tracked in the system: 27.4% Office-Based, 28.0% Hospital-Based
- Difficult to remember my password: 28.6% Office-Based, 27.1% Hospital-Based
- Have to change password too frequently: 23.3% Office-Based, 23.0% Hospital-Based
- Process is too complex: 16.6% Office-Based, 18.0% Hospital-Based
- Using another state’s system: 7.1% Office-Based, 5.7% Hospital-Based

To learn more about the Rhode Island Department of Health’s PDMP, visit: [http://health.ri.gov/healthcare/medicine/about/prescriptiondrugmonitoringprogram/](http://health.ri.gov/healthcare/medicine/about/prescriptiondrugmonitoringprogram/)
Impact of Electronic Health Records on Physicians

Survey respondents who indicated they have an electronic health record (EHR) were asked a series of questions about how they use their EHR and the impact the EHR has had on their practice. These questions ranged from asking physicians about their time spent on inbox tasks to the physical challenges they experience related to HIT use.

Respondents were also asked whether or not they agreed that using an EHR has improved certain work-related processes (Figure 15). A high percentage of respondents agreed that EHRs improve many aspects of their work, including patient safety, communication among staff, and billing processes, but fewer than half agreed that it improved their job satisfaction.

Figure 15. Percent of physician respondents who “agree” or “strongly agree” that using an EHR improves certain work-based processes, by practice setting

- Improves billing processes: 82% (Office-Based), 69% (Hospital-Based)
- Improves communication among the physicians and staff in my practice: 72% (Office-Based), 69% (Hospital-Based)
- Improves patient safety: 63% (Office-Based), 69% (Hospital-Based)
- Improves the care my patients receive: 56% (Office-Based), 63% (Hospital-Based)
- Improves my clinical workflow: 48% (Office-Based), 55% (Hospital-Based)
- Improves my job satisfaction: 32% (Office-Based), 39% (Hospital-Based)
- Improves my overall interaction with patients during visits or encounters: 27% (Office-Based), 34% (Hospital-Based)
Respondents were asked whether they use their EHR from other locations (such as from home or another worksite) and under what circumstances.

Among office- and hospital-based physician respondents, 88.3% reported having access to their EHR from locations other than their main practice. A quarter of office-based physicians reported that the amount of time they spend on their EHR at home is excessive (Figure 16). The most common circumstance under which physicians used their EHR from other locations was not being able to complete their work during regular hours (Table 3).

![Figure 16. Among physicians who have access to their EHR at home, the amount of time spent on the EHR at home, by practice setting](image)

Table 3. Circumstances under which physician respondents indicated they “often” access their EHR from other locations, by practice setting (respondents could choose more than one)

<table>
<thead>
<tr>
<th>Response</th>
<th>Office-based (N=810)</th>
<th>Hospital-based (N=265)</th>
<th>Overall (N=1,075)</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I am not able to complete my work during regular office or clinical hours</td>
<td>70.0%</td>
<td>52.1%</td>
<td>67.4%</td>
</tr>
<tr>
<td>When I am on call</td>
<td>68.3%</td>
<td>57.6%</td>
<td>60.0%</td>
</tr>
<tr>
<td>When I want to prepare for patient visits or encounters in advance</td>
<td>39.7%</td>
<td>33.2%</td>
<td>37.2%</td>
</tr>
<tr>
<td>When I have the opportunity to work at home instead of the office or hospital (i.e., to adjust my work/life balance)</td>
<td>35.2%</td>
<td>25.8%</td>
<td>29.9%</td>
</tr>
<tr>
<td>When I am away on vacation</td>
<td>32.1%</td>
<td>16.6%</td>
<td>27.7%</td>
</tr>
</tbody>
</table>
Respondents were also asked to describe the amount of time they spend on tasks related to their EHR inbox (Figure 17). Nearly two thirds of office-based physicians (62.2%) reported that they spent a “moderately high” or “excessive” amount of time managing their EHR inbox, compared to less than half of hospital-based physicians (40.4%).

**Figure 17. Percent of physician respondents who report spending a “moderately high” or “excessive” amount of time on the following inbox tasks**

<table>
<thead>
<tr>
<th>Task</th>
<th>Office-Based (N=1,008)</th>
<th>Hospital-Based (N=519)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall time spent managing EHR inbox</td>
<td>40.4%</td>
<td>62.2%</td>
</tr>
<tr>
<td>Filling out prior authorizations</td>
<td>33.5%</td>
<td>51.2%</td>
</tr>
<tr>
<td>Reviewing and acting on test results</td>
<td>27.5%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Filling out forms (e.g., disability, home health)</td>
<td>27.5%</td>
<td>48.2%</td>
</tr>
<tr>
<td>Reviewing clinical documentation from other clinicians</td>
<td>27.9%</td>
<td>40.1%</td>
</tr>
<tr>
<td>Responding to patient messages</td>
<td>15.4%</td>
<td>37.3%</td>
</tr>
<tr>
<td>Refilling prescriptions</td>
<td>19.6%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Responding to messages from other clinicians</td>
<td>14.3%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>
Respondents were asked whether they had experienced certain physical challenges as a result of using HIT (Figure 18). The most common HIT-related physical challenge was eye strain, with 42% of office-based physicians and 41% of hospital-based physicians experiencing this challenge.

Figure 18. Among physicians with EHRs, percent of respondents who have experienced the following physical challenges as a result of using HIT, by practice setting
Physician Burnout & HIT-Related Stress

Burnout among healthcare workers is well-documented. Burnout results from persistent and chronic stress and is characterized by a combination of emotional exhaustion, depersonalization, and reduced perception of personal accomplishment. Symptoms of burnout are not only associated with poor health outcomes for the individual but have also been shown to negatively impact the quality of patient care.

539 physician respondents (29.7%) reported experiencing symptoms of burnout. Among the 15 most common specialties, the highest prevalence of burnout was noted among emergency medicine physicians, with 46% reporting symptoms of burnout, followed by pulmonology/critical care, with 40% reporting symptoms of burnout. Orthopedic surgeons reported the lowest prevalence of burnout—about 19% (Figure 20). These estimates are lower than those reported in recent literature, where about 50% of all physicians reported burnout symptoms. The fact that the survey was not anonymous and was administered by the Department of Health, which also oversees physician licensing, may have affected response patterns to this question.

Figure 20. Percent of survey respondents who reported experiencing any symptoms of burnout, by specialty, among the 15 most common specialties (N=1,815)

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Burnout Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Medicine (n=89)</td>
<td>46.1%</td>
</tr>
<tr>
<td>Pulmonary/Critical Care (n=40)</td>
<td>40.0%</td>
</tr>
<tr>
<td>OB-GYN (n=87)</td>
<td>37.9%</td>
</tr>
<tr>
<td>Neurology (n=48)</td>
<td>35.4%</td>
</tr>
<tr>
<td>Family Medicine (n=147)</td>
<td>34.0%</td>
</tr>
<tr>
<td>Radiology (n=72)</td>
<td>33.3%</td>
</tr>
<tr>
<td>Pediatrics (n=166)</td>
<td>32.5%</td>
</tr>
<tr>
<td>Internal Medicine (General) (n=258)</td>
<td>32.2%</td>
</tr>
<tr>
<td>Surgery (General &amp; other) (n=57)</td>
<td>31.6%</td>
</tr>
<tr>
<td>All Physicians (n=1,815)</td>
<td>29.7%</td>
</tr>
</tbody>
</table>

A 2015 study revealed that 46% of U.S. physician respondents reported at least one symptom of burnout.

Medical scribes, trained professionals who assist physicians with documentation, may mitigate HIT-related stress. In Rhode Island, 10% of physician respondents reported using a scribe (office-based = 9.0%; hospital-based = 11.3%).

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Despite the comprehensive literature examining burnout among healthcare workers, less is known about the role of health information technology (HIT) in either contributing to or mitigating the development of clinician burnout. The HIT-related stress measures used in this report are as follows:

1. Sufficiency of time for documentation
2. Whether the EHR adds to the frustration of the day
3. Amount of time spent on the EHR at home

We examined the prevalence of these measures among respondents and whether the measures are associated with symptoms of burnout among physicians who use EHRs in their clinical practice (Table 4).

Physician respondents who reported that the EHR adds to their daily frustration had 2.3 times the odds of being burned out compared to those who did not feel the EHR added to their daily frustration, after adjusting for the other two HIT-related stress measures. Respondents who reported insufficient time for documentation had 3.7 times the odds of being burned-out compared to those with sufficient time, after adjusting for the other HIT-related stress measures. Respondents who reported spending a “moderately high” or “excessive” amount of time on the EHR at home had 1.2 times the odds of being burned-out than those who described their time as “minimal/none.” This number did not reach statistical significance when controlling for the other two HIT-related stress measures.

### Table 4. Adjusted odds ratios of burnout among physicians in Rhode Island (N=1,644)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sufficiency of Time for Documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Insufficient</td>
<td>3.7</td>
<td>2.8-4.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EHR Adds to Daily Frustration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Yes</td>
<td>2.3</td>
<td>1.7-3.1</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Time Spent on the EHR at Home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal/None</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Modest/Satisfactory</td>
<td>1.1</td>
<td>0.8-1.5</td>
<td>n.s.</td>
</tr>
<tr>
<td>Moderately High/Excessive</td>
<td>1.2</td>
<td>0.9-1.5</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Results from the logistic regression procedure indicated that when all three HIT-related stress measures are included together, they improved the prediction of global burnout, compared to including each independently. When the HIT-related stress measures were considered together the pseudo-$R^2$ was highest at 0.13, compared to when time spent on the EHR at home (pseudo-$R^2 = 0.03$), EHR adds to daily frustration (pseudo-$R^2 = 0.06$), and sufficiency of time for documentation (pseudo-$R^2 = 0.11$) were included independently. A higher pseudo-$R^2$ suggests a better fit.
There is a high prevalence of HIT-related stress across the 15 most common specialties (Figure 21). In seven specialties, more than a quarter of physicians reported they were experiencing all three measures of HIT-related stress.

Across the 15 most common office and hospital-based specialties, the most commonly reported measure of HIT-related stress is that the EHR adds to the frustration of the physician’s day (Figure 22, page 24).

Figure 21. Percent of survey respondents with EHRs who reported experiencing one or more measures of HIT-related stress, by specialty, among the 15 most common specialties
Figure 22. Percent of survey respondents with EHRs who reported each measure of HIT-related stress, by specialty, among the 15 most common specialties (respondents could select more than one)

- EHR Adds to Daily Frustration
- Insufficient Time for Documentation
- Moderately High/Excessive Time Spent on the EHR at Home

Specialties: Emergency Medicine, Pulmonary/Critical Care, Ophthalmology, Orthopedic Surgery, Family Medicine, Internal Medicine (General), Pediatrics, OB-GYN, Surgery (General and other), Dermatology, Neurology, Psychiatry, Radiology, Hospitalist, Anesthesiology

All Physicians
Respondents were asked to select the features of HIT that they find stressful (Figure 23). The majority of both hospital and office-based physicians found the number of clicks required to accomplish a task, the lack of interoperability, note bloat, and the fear of missing important information due to the volume of data in chart to be stressful. Office-based physicians were more likely to find the impact of HIT on the interaction with patients stressful than hospital-based physicians (57% compared to 42%).

Figure 23. Among physicians with EHRs, percent of respondents who find the following features of HIT stressful, by practice setting (respondents could select more than one)
Strategies & Support for Reducing HIT-Related Stress

Physician respondents who indicated they have an electronic health record (EHR) were asked a series of questions about the types of support they receive, such as technical support, use of scribes, and assistance with EHR inbox tasks.

The majority of office- and hospital-based respondents reported that the effectiveness and availability of technical support usually met their needs (Figures 24). Use of scribes was more common among office-based physicians than among hospital-based physicians (11.3% vs. 9.0%). More office-based physicians reported “almost always” or “often” receiving assistance with EHR inbox tasks than hospital-based physicians (35.1% vs. 11.4%). Among hospital-based respondents, 53.0% reported “never” receiving assistance with EHR inbox tasks (Figure 25).

Figure 24. Among physicians with EHRs, percent of respondents who report receiving HIT-related technical support that “usually meets my needs”

Figure 25. How often physician respondents receive assistance from someone in their practice in managing their inbox tasks, by practice setting
Survey respondents with EHRs were also asked about changes made by their practices to improve their experience working with health information technology (HIT) and whether these changes were actually useful. (Figure 26 & Figure 27, page 28).

Among office-based physicians whose practices had implemented changes to improve their experience with HIT, the most frequently implemented strategy was voice-recognition dictation software (48.1%), followed by printers in the clinical area (42.9%), and staff support with EHR tasks (35.9%). Not all implemented changes were felt to be an improvement; however, three quarters of physicians who had experienced the following changes felt they were useful: staff support with EHR tasks, scheduled time blocks to complete desk work, and staff support with documentation (Figure 26).

**Figure 26. Among office-based physicians with EHRs, percent of respondents whose practice implemented the following changes and which changes were actually useful in improving their experience working with HIT (N=1,090)**

- Voice-recognition dictation software: 48.1%
- Printers in room or clinical area: 42.9%
- Staff support with EHR tasks: 35.9%
- Badge or fingerprint login: 20.9%
- Scheduled time blocks to complete desk work: 16.6%
- Staff support with documentation: 16.5%
- Recurring IT training, including one-on-one: 15.0%
- Touchscreen functionality: 12.8%
- Reducing the number of clicks for common EHR tasks: 10.5%
- None: 15.2%
Among hospital-based physicians whose practices had implemented changes to improve their experience with HIT, the most frequently implemented strategy was also voice-recognition dictation software (68.0%), followed by badge or fingerprint login (50.7%), and printers in the clinical area (45.3%).

Among hospital-based physicians whose practice implemented the changes, the highest proportion found touchscreen functionality useful (74.4%) and the smallest proportion found recurring IT training, including one-on-one, useful (41.4%) (Figure 27).

**Figure 27.** Among hospital-based physicians with EHRs, percent of respondents whose practice implemented the following changes and which changes were *actually useful* in improving their experience working with HIT (N=600)
Survey respondents with EHRs were also asked about changes they had personally made to improve their experience working with health information technology (HIT) and whether these changes were actually useful (Figure 28 & Figure 29, page 30).

Self-care was the most frequently cited personal change among both office-based and hospital-based physicians (47.9% and 47.3% respectively). Over a quarter of office-based physician respondents (26.2%) reported reducing clinical hours or working part-time to improve their experience working with HIT, as compared to 14.7% of hospital-based physicians. Not all implemented changes were felt to be an improvement; however, three quarters of office-based physicians who made the following changes felt they were useful: self care, customizing the EHR, writing more concise notes, strict work/life boundaries, and reducing clinical hours (Figure 28). Among hospital-based physicians, three quarters who made the following changes felt they were useful: talking with colleagues to learn tips and tricks, customizing the EHR, writing more concise notes, strict work/life boundaries, and reducing clinical hours (Figure 29, page 30).

Figure 28. Among office-based physicians with EHRs, percent of respondents who implemented the following personal changes and which were actually useful in improving their experience working with HIT (N=1,090)

- Self-care (e.g., exercise, meditation, sleep) 47.9%
- Customizing the EHR (e.g., shortcuts) 41.7%
- More concise notes 39.3%
- Talking with colleagues to learn tips and tricks 38.3%
- Talking with colleagues about the challenges 36.1%
- Strict work/life boundaries (e.g., setting limits on EHR use at home) 28.9%
- Reduction of clinical hours or working part-time 26.2%
- EHR training refresher courses 3.8%
- None 13.7%
Figure 29. Among hospital-based physicians with EHRs, percent of respondents who implemented the following personal changes and which were *actually useful* in improving their experience working with HIT (N=600)

- **Self-care (e.g., exercise, meditation, sleep)**: 47.3%
- **Talking with colleagues to learn tips and tricks**: 44.3%
- **Customizing the EHR (e.g., shortcuts)**: 36.8%
- **Talking with colleagues about the challenges**: 35.7%
- **More concise notes**: 35.2%
- **Strict work/life boundaries (e.g., setting limits on EHR use at home)**: 30.7%
- **Reduction of clinical hours or working part-time**: 14.7%
- **EHR training refresher courses**: 2.7%
- **None**: 13.8%
Health Information Exchange

CurrentCare, Rhode Island’s health information exchange (HIE), enables authorized clinicians to securely access patients’ health information from multiple sources in one integrated and centralized electronic location.

Survey respondents were asked a series of questions about their knowledge and use of CurrentCare. Figures 30 and 31 (page 32) demonstrate the services with which respondents are familiar, stratified by practice setting and by specialty (primary care physician [PCP] vs. non-PCP). Generally, office-based respondents, particularly those who provide primary care, are more familiar with these services than hospital-based respondents.

Figure 30. HIE services with which physician respondents are familiar, by practice setting

<table>
<thead>
<tr>
<th>Service</th>
<th>Somewhat/slightly familiar</th>
<th>Very familiar</th>
</tr>
</thead>
<tbody>
<tr>
<td>CurrentCare Viewer</td>
<td>30.1%</td>
<td>9.8%</td>
</tr>
<tr>
<td>CurrentCare in EHR</td>
<td>21.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>CurrentCare Hospital Alerts</td>
<td>21.5%</td>
<td>8.4%</td>
</tr>
<tr>
<td>CurrentCare Hospital Alerts</td>
<td>20.1%</td>
<td>5.3%</td>
</tr>
<tr>
<td>CurrentCare for Me</td>
<td>19.4%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Care Management Alerts/Dashboards</td>
<td>17.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>CurrentCare for Me Designee Alerts</td>
<td>11.2%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Care Management Alerts/Dashboards</td>
<td>16.1%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Hospital-based (N=608)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat/slightly familiar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very familiar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office-based (N=1,189)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat/slightly familiar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very familiar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 31. HIE services with which office-based physician respondents are familiar, by specialty

Rhode Island Quality Institute operates the statewide health information exchange, CurrentCare. To learn more, visit [www.currentcareri.org](http://www.currentcareri.org/).
Respondents were also asked whether they, or any of their staff, use CurrentCare services and the specific tasks for which they use these services. Among all physician respondents, the most common use case scenarios were employing the CurrentCare Viewer to improve transitions of care and to locate specific test results (about 15% for each).

Overall, more PCPs reported using CurrentCare services (compared to non-PCPs). CurrentCare Viewer was the most commonly used HIE service among PCPs and their staff across all five use case scenarios (Figure 32). Nearly a third of PCPs (31%) reported using CurrentCare Viewer to improve transitions of care.

**Figure 32. HIE services that primary care physician respondents or their staff use (N=340)**

<table>
<thead>
<tr>
<th>Use Case Scenarios</th>
<th>Transitions of Care</th>
<th>Locating Specific Results</th>
<th>Pre-visit Planning</th>
<th>Medication Reconciliation</th>
<th>Quality Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CurrentCare Viewer</td>
<td>31%</td>
<td>21%</td>
<td>14%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>CurrentCare in EHR</td>
<td>29%</td>
<td>15%</td>
<td>13%</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>CurrentCare Hospital Alerts</td>
<td>28%</td>
<td>9%</td>
<td>8%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Care Management Alerts/Dashboards</td>
<td>19%</td>
<td>6%</td>
<td>15%</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>CurrentCare for Me</td>
<td>4%</td>
<td>5%</td>
<td>11%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>CurrentCare for Me Designee Alerts</td>
<td>4%</td>
<td>3%</td>
<td>11%</td>
<td>3%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Respondents were asked about barriers to using CurrentCare (Figure 33). For office-based physicians, the most common barriers to using CurrentCare services were not knowing about the services (50.2%) and that not all of their patients were enrolled in CurrentCare (29.6%). For hospital-based physicians, the most common barriers were not knowing about the services (56.8%) and that the services are not applicable to their practice (24.7%).

When asked which data types, if added to CurrentCare, would be valuable in caring for patients, about half of respondents reported that access to consult notes (55.5%) and progress notes for each encounter (48.2%) would be valuable (Figure 32, page 35).

**Figure 33. Barriers to using HIE services, by practice setting**

- Did not know about the services: 50.2% (office), 56.8% (hospital)
- Not all patients are enrolled in CurrentCare: 29.6% (office), 16.6% (hospital)
- Do not have the time to figure out how to use them: 29.3% (office), 19.2% (hospital)
- Services not applicable to practice: 16.8% (office), 24.7% (hospital)
- Too cumbersome and difficult to work with: 15.8% (office), 9.6% (hospital)
- Doesn't have the information I'm looking for: 15.6% (office), 9.1% (hospital)
- Have all the information needed within EHR: 10.9% (office), 6.1% (hospital)
- Other: 7.3% (office), 4.7% (hospital)
Figure 32. Data types physician respondents thought would be valuable for patient care, if added to CurrentCare (respondents could select more than one) (N= 1,364)

- Consult notes for each encounter: 55.5%
- Progress notes for each encounter: 48.2%
- Radiology images (not reports): 42.4%
- Care Plans: 30.6%
- Patient use of community/social services: 19.7%
- Remote monitoring data (e.g., home blood pressure monitoring): 18.0%
- Screening for social determinants of health: 17.5%
- Patient-reported outcomes: 14.6%
- Nursing notes for each encounter: 9.6%
- Dental visit notes: 8.7%
- Other: 13.3%
Use of HIT for Patient Engagement

As technology becomes more integrated into medical practice, physicians have had to modify how they engage with patients and their health data.

Incorporating the electronic health record (EHR) during clinical encounters changes how physicians interact with their patients. There are strategies for patient-centered EHR use that can foster patient engagement and promote shared decision making.19

Figure 33 shows which strategies physicians find useful in improving patient-centered communication. About two-thirds of office-based respondents found it useful to disengage from the computer completely when discussing sensitive issues with their patients (63.9%) and to begin the patient interaction face-to-face before starting work in the EHR (62.8%). A similar proportion of hospital-based physicians found it useful to limit the use of the EHR during the encounter and perform most documentation afterward (63.8%). About 15% of respondents indicated that these strategies were not applicable to their practice.

Figure 33. Among physicians with EHRs, percent of respondents who have found the following strategies useful in improving patient-centered communication during visits or encounters, by practice setting

- Disengage from the computer completely when discussing sensitive issues with the patient (63.9%)
- Begin the interaction face-to-face before starting work in the EHR (62.8%)
- Look up frequently from the computer to reestablish eye contact with the patient (59.2%)
- Limit use of the EHR during the visit or encounter and performing most documentation afterwards (63.8%)
- Explain what you are doing in the EHR as you are doing it (36.8%)
- Position the computer so that the patient can see the screen at the same time (32.6%)

Patient engagement involves more than how physicians and patients interact during a clinical encounter. **Figure 34** shows how office- and hospital-based physician respondents communicate with patients outside of a face-to-face encounter. Nearly all physicians report communicating with patients via telephone.

**Figure 34. Percent of physician respondents who personally (i.e., not their office staff) communicate with patients using each modality, outside of a face-to-face encounter, by practice setting**

- **Telephone**: Office-Based (N=1,205) - 91.3%
- **Messaging via patient portal**: Office-Based (N=1,205) - 39.0%
- **US mail**: Office-Based (N=1,205) - 32.0%
- **Email**: Office-Based (N=1,205) - 18.9%
- **Text messaging**: Office-Based (N=1,205) - 10.5%
- **Fax**: Office-Based (N=1,205) - 5.4%
- **Video calling**: Office-Based (N=1,205) - 2.7%
- **Other**: Office-Based (N=1,205) - 5.7%
- **Not Applicable**: Office-Based (N=1,205) - 0%

- **Hospital-Based (N=613)**
  - Telephone - 61.8%
  - Messaging via patient portal - 9.5%
  - US mail - 10.3%
  - Email - 10.6%
  - Text messaging - 4.1%
  - Fax - 2.0%
  - Video calling - 1.5%
  - Other - 1.8%
  - Not Applicable - 5.7%

Messaging patients via a patient portal increased between 2015 and 2019, from 24.4% to 39.0% for office-based physicians and 6.4% to 9.5% for hospital-based respondents.
Patient engagement also includes patients sharing their own health information with their physician. Patient-generated health data are data gathered by or from patients to address a health concern. Ideally, patient-generated health data would complement traditional clinical data and help to provide a more comprehensive understanding of a patient’s health. Figure 35 shows which types of patient-generated health data physician respondents would generally find useful.

Figure 35. Among physicians with EHRs, percent of respondents who would generally find the following types of patient-generated health data useful

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Office-based (N=1,070)</th>
<th>Hospital-based (N=590)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home blood pressure or glucose monitoring</td>
<td>Very useful: 31.5%</td>
<td>Very useful: 66.4%</td>
</tr>
<tr>
<td></td>
<td>Somewhat useful: 21.0%</td>
<td>Somewhat useful: 46.9%</td>
</tr>
<tr>
<td></td>
<td>Not at all useful: 7.4%</td>
<td>Not at all useful: 19.0%</td>
</tr>
<tr>
<td></td>
<td>Not applicable: 40.1%</td>
<td>Not applicable: 46.9%</td>
</tr>
<tr>
<td>Advance directives, living wills, or health proxy information</td>
<td>Very useful: 30.1%</td>
<td>Very useful: 38.7%</td>
</tr>
<tr>
<td></td>
<td>Somewhat useful: 24.1%</td>
<td>Somewhat useful: 33.3%</td>
</tr>
<tr>
<td></td>
<td>Not at all useful: 7.1%</td>
<td>Not at all useful: 11.8%</td>
</tr>
<tr>
<td></td>
<td>Not applicable: 38.7%</td>
<td>Not applicable: 33.3%</td>
</tr>
<tr>
<td>Self-administered pain, substance use, or depression scales/screenings</td>
<td>Very useful: 22.3%</td>
<td>Very useful: 55.5%</td>
</tr>
<tr>
<td></td>
<td>Somewhat useful: 32.6%</td>
<td>Somewhat useful: 41.9%</td>
</tr>
<tr>
<td></td>
<td>Not at all useful: 11.8%</td>
<td>Not at all useful: 31.5%</td>
</tr>
<tr>
<td></td>
<td>Not applicable: 33.3%</td>
<td>Not applicable: 33.3%</td>
</tr>
<tr>
<td>Self-administered social determinants of health screenings</td>
<td>Very useful: 16.4%</td>
<td>Not at all useful: 66.4%</td>
</tr>
<tr>
<td></td>
<td>Somewhat useful: 28.9%</td>
<td>Not applicable: 46.9%</td>
</tr>
<tr>
<td></td>
<td>Not at all useful: 12.7%</td>
<td>Not applicable: 46.9%</td>
</tr>
<tr>
<td></td>
<td>Not applicable: 41.9%</td>
<td>Not applicable: 46.9%</td>
</tr>
<tr>
<td>Fitness tracker heart rate or electrocardiogram waveform</td>
<td>Very useful: 8.3%</td>
<td>Very useful: 8.3%</td>
</tr>
<tr>
<td></td>
<td>Somewhat useful: 25.7%</td>
<td>Somewhat useful: 25.7%</td>
</tr>
<tr>
<td></td>
<td>Not at all useful: 19.0%</td>
<td>Not at all useful: 19.0%</td>
</tr>
<tr>
<td></td>
<td>Not applicable: 46.9%</td>
<td>Not applicable: 46.9%</td>
</tr>
</tbody>
</table>

19 The Office of the National Coordinator for Health Information Technology. Patient-Generated Health Data. 21 March 2018. Available at: https://www.healthit.gov/topic/scientific-initiatives/patient-generated-health-data
Incentive Programs & Alternative Payment Models

Many incentive programs and alternative payment models rely on electronic health records (EHRs) for documentation and calculation of quality metrics. Models generally attempt to incentivize high-quality and efficient care. For many physicians, these programs require significant changes to their workflow, including how they use EHRs.

The 2019 Health Information Technology (HIT) Survey measured the percent of Rhode Island office-based physicians whose main practice site participates in an alternative payment model. A quarter of office-based physicians (24.2%) reported that their main practice is a Patient-Centered Medical Home (PCMH). Meanwhile, one in five respondents did not know if their practice participated in these types of programs (Figure 36).

Figure 36. Percent of office-based physician respondents whose main practice site participates in an alternative payment model (N=1,207)

<table>
<thead>
<tr>
<th>Program</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Centered Medical Home (PCMH)</td>
<td>24.2%</td>
</tr>
<tr>
<td>Accountable Care Organization (ACO)</td>
<td>21.0%</td>
</tr>
<tr>
<td>Care Transformation Collaborative (CTC)</td>
<td>7.0%</td>
</tr>
<tr>
<td>Comprehensive Primary Care Plus (CPC+)</td>
<td>7.2%</td>
</tr>
<tr>
<td>Medicaid Accountable Entity</td>
<td>5.2%</td>
</tr>
<tr>
<td>Transforming Clinical Practices Initiative (TCPI)</td>
<td>0.9%</td>
</tr>
<tr>
<td>None of the above</td>
<td>47.8%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>20.5%</td>
</tr>
</tbody>
</table>
The Centers for Medicare & Medicaid Services (CMS) introduced the Meaningful Use program in 2011. This program offers incentives for physicians to adopt, implement, and demonstrate “meaningful use” of certified EHRs. This program also requires physicians to achieve specific standards for the use of EHRs and other HIT during clinical practice.

The 2019 HIT Survey measured Rhode Island physicians’ participation in the Medicaid Meaningful Use program. Figure 37 shows that 10.6% of office-based physicians have attested to Medicaid Meaningful Use. The majority of physicians (60.8%) report they “don’t know” if they attested to Meaningful Use or to what level they attested. Half of the office-based physicians who have previously attested plan to attest, or have someone attest on their behalf, to Medicaid Meaningful Use in 2019 (Figure 38).

Figure 37. Percent of office-based physician respondents with EHRs who have attested to Medicaid Meaningful Use (N=1,089)

<table>
<thead>
<tr>
<th>Medicaid Stage</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid Adoption, Implementation, Upgrade (AIU)</td>
<td>3.0%</td>
</tr>
<tr>
<td>Medicaid Stage 1</td>
<td>3.6%</td>
</tr>
<tr>
<td>Medicaid Stage 2</td>
<td>1.0%</td>
</tr>
<tr>
<td>Medicaid Stage 3</td>
<td>3.0%</td>
</tr>
<tr>
<td>No</td>
<td>28.2%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>60.8%</td>
</tr>
</tbody>
</table>

Figure 38. Percent of office-based physician respondents with EHRs who plan to attest to Medicaid Meaningful Use in 2019* (N=120)

<table>
<thead>
<tr>
<th>Decision</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, completed all years of attestations</td>
<td>46.7%</td>
</tr>
<tr>
<td>No, practice decided to stop attesting to Meaningful Use</td>
<td>14.2%</td>
</tr>
<tr>
<td>No, completed all years of attestations</td>
<td>18.3%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>20.8%</td>
</tr>
</tbody>
</table>

*Includes only those physicians who had previously attested (or had someone attest on their behalf) to the Medicaid Meaningful Use program
HIT in Post-Acute & Long-Term Care Settings

Post-acute care (PAC) is an umbrella term that covers rehabilitation and palliative services that individuals receive after or in the place of a stay in an acute care hospital. PAC can take place in many settings, including nursing homes and at home.

129 survey respondents (7.1%) reported providing direct patient care through a home health or home hospice organization and 5.8% reported providing direct patient care in a nursing home or skilled nursing facility.

While the majority of respondents providing direct care in nursing homes have access to basic EHR functionality (e.g., patient demographics, writing progress or visit notes, medication administration record), half have remote access to the nursing home chart and less than a third can order laboratory tests or receive laboratory results (Figure 39). About 9% of nursing home physicians can electronically prescribe medications given in the nursing home.

Figure 39. Prevalence of physician-reported EHR functions in nursing homes (N= 91)

- Patient demographics: 70.3%
- Writing progress notes/visit notes: 64.8%
- Medication administration record: 52.7%
- Remote access to the chart from home or another location: 44.0%
- Documenting problem lists: 40.7%
- Receiving laboratory results: 31.9%
- Ordering laboratory tests: 26.4%
- E-prescribing for facility administration of medications: 8.8%
- Other: 13.2%

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Physicians without Electronic Health Records

About 7.5% of physicians reported that they do not use electronic health records (EHRs). Respondents without EHRs were asked about burnout and health information technology (HIT)-related stress. The overall prevalence of burnout was lower among physicians without EHRs than those with EHRs (10.9% versus 29.7%, respectively). Two-thirds of office-based physicians without EHRs indicated that they had “good” or “optimal” control over their workload, and only a small number responded that they had “poor” or “marginal” control over their workload (Figure 40).

Similarly, most office-based physicians without EHRs reported that their sufficiency of time for documentation was “optimal” or “good” (Figure 41). Compared to office-based physicians with EHRs, respondents without EHRs were much more likely to indicate that they have “good” or “optimal” time for documentation. A much higher proportion of respondents with EHRs indicated that they have “poor” or “marginal” time for documentation (13.8% for those without EHRs versus 51.0% for those with EHRs).

Figure 40. Respondents’ assessment of their control over their workload, among office-based physicians without EHRs (N=117)

- Optimal: 30.8%
- Good: 36.8%
- Satisfactory: 24.8%
- Poor or Marginal: 7.7%

Figure 41. Office-based physician respondents’ assessment of their sufficiency of time for documentation, by EHR status

- Optimal: 4.6% vs. 24.1%
- Good: 15.4% vs. 34.5%
- Satisfactory: 27.6% vs. 29.0%
- Poor or Marginal: 13.8% vs. 51.0%
Advanced Practice Provider Summary Measures

The 2019 Health Information Technology (HIT) Survey was administered to 1,977 advanced practice providers (APPs), including advanced practice registered nurses (APRNs) and physician assistants (PAs). The survey was distributed to all APPs licensed in Rhode Island, in active practice, and located in Rhode Island, Connecticut, or Massachusetts. The survey received a total of 633 responses, for a response rate of 32%.

Table 4 presents the prevalence of electronic health record (EHR) use, e-prescribing, and health information technology (HIT)-related stress for the 633 APRN and PA respondents. Figure 42 (page 44) on the following page compares this year’s results to data from prior survey years.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Respondents</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APRNs and PAs with EHRs&lt;sup&gt;21&lt;/sup&gt;</td>
<td>633</td>
<td>597 (94.3%)</td>
</tr>
<tr>
<td>APRNs and PAs who e-prescribe&lt;sup&gt;22&lt;/sup&gt;</td>
<td>549</td>
<td>448 (81.6%)</td>
</tr>
<tr>
<td>APRNs and PAs who e-prescribe controlled substances&lt;sup&gt;23&lt;/sup&gt;</td>
<td>482</td>
<td>195 (40.5%)</td>
</tr>
<tr>
<td>APRNs and PAs experiencing HIT-related stress&lt;sup&gt;24&lt;/sup&gt;</td>
<td>589</td>
<td>392 (66.6%)</td>
</tr>
</tbody>
</table>

<sup>21</sup> EHR was defined in the survey as an integrated electronic clinical information system that tracks patient health data and may include such functions as visit notes, prescriptions, lab orders, etc.

<sup>22</sup> Excludes APRNs and PAs who responded that prescribing was not applicable to their practice.

<sup>23</sup> Excludes APRNs and PAs who responded that they do not prescribe medications or that they do not prescribe any controlled substances.

<sup>24</sup> HIT-related stress was considered present if the respondent indicated 1 or more of the following: 1) agree/strongly agree that EHRs add to the frustration of their day, 2) moderately high/excessive use of the EHR at home, and 3) poor/marginal time for documentation. This measure is not reported at the individual clinician level.
The prevalence of EHRs among APRNs and PAs has slowly increased from 2013 to 2019, and has reached a level similar to that of physicians (94.3% of APPs, 92.5% of physicians).

Table 5. APRN and PA publicly-reported measures, by practice setting

<table>
<thead>
<tr>
<th>Measure</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>APRNs and PAs with EHRs, n (%)</td>
<td>Office (N=422)</td>
</tr>
<tr>
<td></td>
<td>Hospital (N=211)</td>
</tr>
<tr>
<td>APRNs and PAs who e-prescribe, n (%)</td>
<td>391 (92.7%)</td>
</tr>
<tr>
<td></td>
<td>206 (97.6%)</td>
</tr>
<tr>
<td>APRNs and PAs who e-prescribe controlled substances, n (%)</td>
<td>355 (87.9%)</td>
</tr>
<tr>
<td></td>
<td>93 (64.1%)</td>
</tr>
<tr>
<td>APRNs and PAs experiencing HIT-related stress, n (%)</td>
<td>149 (42.3%)</td>
</tr>
<tr>
<td></td>
<td>46 (35.4%)</td>
</tr>
<tr>
<td></td>
<td>277 (72.1%)</td>
</tr>
<tr>
<td></td>
<td>115 (56.1%)</td>
</tr>
</tbody>
</table>
Advanced Practice Provider E-Prescribing Practices & Use of the Prescription Drug Monitoring Program

Electronic-prescribing, or e-prescribing, is a computerized framework that enables clinicians to send prescriptions electronically to participating pharmacies, instead of by fax, or mail or paper delivery.\textsuperscript{13} E-prescriptions tend to be more accurate and legible, possibly reducing errors.\textsuperscript{14} The Centers for Medicare & Medicaid Services (CMS) state that e-prescribing “is an important element in improving the quality of patient care.”\textsuperscript{13}

The Health Information Technology (HIT) Survey measures use of e-prescribing among Rhode Island advanced practice providers (APPs), including advanced practice registered nurses (APRNs) and physician assistants (PAs).

Figure 43 shows how often APPs transmit prescriptions electronically to the pharmacy. Hospital-based APPs were asked to only consider outside or community-based pharmacies and not the hospital pharmacy.

The majority (58.6\%) of office-based APPs who prescribe medications report that they “always” transmit prescriptions electronically to the pharmacy. Among hospital-based APPs who prescribe medications, 25.0\% “always” transmit prescriptions electronically to an outside or community pharmacy.

**Figure 43. Among advanced practice respondents who prescribe medications, the percent who transmit prescriptions electronically to the pharmacy**

<table>
<thead>
<tr>
<th>System can electronically transmit prescriptions, but I do not use this functionality</th>
<th>Office-Based (N=403)</th>
<th>Hospital-Based (N=144)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>58.6%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Often</td>
<td>26.6%</td>
<td>21.5%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>18.1%</td>
<td>14.6%</td>
</tr>
<tr>
<td>System cannot electronically transmit prescriptions</td>
<td>20.8%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>


\textsuperscript{14} Porterfield, A., K. Engelbert, and A. Coustasse, Electronic prescribing: improving the efficiency and accuracy of prescribing in the ambulatory care setting. Perspect Health Inf Manag. 11: p. 1g.
In addition to measuring the prevalence of e-prescribing among Rhode Island APPs, the 2019 HIT Survey also assessed the prescribing of controlled substances, specifically. Controlled substances are medications, such as opioids and benzodiazepines, categorized under the Controlled Substances Act (CSA) by their risk for abuse and risk of dependence when abused.

Rhode Island passed a law that takes effect on January 2, 2020, requiring the e-prescribing of all controlled substances. Over half of the APP respondents (52.8%) were unaware of this law when surveyed in May of 2019.

Figure 44 shows the percent of APPs who transmit controlled substance prescriptions electronically. This figure only includes those APPs who prescribe controlled substances and are able to e-prescribe medications. Hospital-based APPs answered about their ability to electronically transmit controlled substance prescriptions to an outside or community pharmacy. Nearly half of office-based APPs (46.6%) and over half of hospital-based APPs (52.9%) who e-prescribe medications reported electronically transmitting controlled substance prescriptions.

Figure 44. Among the advanced practice providers who e-prescribe medications and prescribe controlled substances, the respondents who e-prescribe controlled substances, by practice setting

- **Always**: 23.8% (Office-based), 20.7% (Hospital-based)
- **Often**: 9.3% (Office-based), 13.8% (Hospital-based)
- **Sometimes**: 13.6% (Office-based), 18.4% (Hospital-based)
- **System can electronically transmit controlled substance prescriptions, but do not use this functionality**: 13.0% (Office-based), 25.3% (Hospital-based)
- **System cannot electronically transmit controlled substance prescriptions**: 40.4% (Office-based), 21.8% (Hospital-based)
Figure 45 shows the prevalence of reported barriers to e-prescribing controlled substances, among APPs who prescribe these types of medication. Among office-based APPs, the most frequently reported barrier to e-prescribing controlled substances was a lack of EHR capability. Among hospital-based APPs, the most common barrier was the clinicians' preference for paper prescriptions.

Figure 45. Among advanced practice provider respondents who prescribe controlled substances, but who are unable to transmit the prescriptions electronically, the barriers to e-prescribing controlled substances, by practice setting (respondents were allowed to select more than one)

- Computer system is not capable:
  - Office-based (N=166): 36.1%
  - Hospital-based (N=38): 26.3%

- Pharmacy requires paper copies of these prescriptions:
  - Office-based (N=166): 28.9%
  - Hospital-based (N=38): 31.6%

- Did not know that this was legal in Rhode Island:
  - Office-based (N=166): 22.3%
  - Hospital-based (N=38): 15.8%

- I prefer paper prescriptions:
  - Office-based (N=166): 21.7%
  - Hospital-based (N=38): 39.5%

- Too few prescriptions to make it worth while:
  - Office-based (N=166): 13.3%
  - Hospital-based (N=38): 13.2%

- Computer system is too expensive:
  - Office-based (N=166): 10.2%
  - Hospital-based (N=38): 0.0%

- Computer system is too complicated:
  - Office-based (N=166): 4.2%
  - Hospital-based (N=38): 10.5%

- Patients prefer paper prescriptions:
  - Office-based (N=166): 1.2%
  - Hospital-based (N=38): 5.3%
Among APPs who prescribe controlled substances, 88.9% prescribe opioids or benzodiazepines. **Figure 46** shows the percent of office-based APPs who consult the Prescription Drug Monitoring Program (PDMP) before prescribing these medications in four different patient scenarios.

Office-based APPs report consulting the PDMP more often for new patients than for established patients and more often for new prescriptions than for refill prescriptions. For a new patient requesting a new prescription, 87.1% of APPs report consulting the PDMP for the majority of patients in that scenario. For an established patient requesting a refill, 70.1% of APPs report consulting the PDMP for a majority of patients in that scenario.

**Figure 46.** Among office-based advanced practice provider respondents who prescribe controlled substances, the percent who consult the Rhode Island PDMP before prescribing opioids or benzodiazepines in the following situations (N=280)

- **A NEW prescription for a NEW patient:**
  - Use the PDMP in more than half of these situations: 87.1%
  - Use the PDMP in fewer than half of these situations: 9.1%
  - Do not use the PDMP in these situations: 3.8%

- **A NEW prescription for an ESTABLISHED patient:**
  - Use the PDMP in more than half of these situations: 76.8%
  - Use the PDMP in fewer than half of these situations: 18.9%
  - Do not use the PDMP in these situations: 4.3%

- **A REFILL prescription for a NEW patient:**
  - Use the PDMP in more than half of these situations: 85.1%
  - Use the PDMP in fewer than half of these situations: 11.7%
  - Do not use the PDMP in these situations: 3.2%

- **A REFILL prescription for an ESTABLISHED patient:**
  - Use the PDMP in more than half of these situations: 70.1%
  - Use the PDMP in fewer than half of these situations: 24.6%
  - Do not use the PDMP in these situations: 5.2%

**Figure 47 (page 49)** shows how often hospital-based APPs consult the PDMP when prescribing opioids or benzodiazepines intended for use outside of their hospital or facility. Over half (51.6%) of hospital-based APPs report “always” consulting the PDMP before prescribing opioids or benzodiazepines.

**Figure 48 (page 49)** shows the prevalence of reported barriers to using the RI PDMP. Among both hospital- and office- based APPs, the most frequently reported barrier to using the RI PDMP was that there is a separate login to access the system.
Figure 47. Among hospital-based advanced practice provider respondents who prescribe controlled substances, the percent who consult the Rhode Island PDMP before prescribing opioids or benzodiazepines* (N=124)

*Advanced practice providers were asked to consider only opioid and benzodiazepine prescriptions intended for use outside the hospital or facility.

Figure 48. Among advanced practice provider respondents, the barriers to using the Rhode Island PDMP, by practice setting (respondents were allowed to select more than one)

To learn more about the Rhode Island Department of Health’s PDMP, visit:
http://health.ri.gov/healthcare/medicine/about/prescriptiondrugmonitoringprogram/
Advanced Practice Provider Burnout & HIT-Related Stress

Burnout among healthcare workers is well-documented. Burnout results from persistent and chronic stress and is characterized by a combination of emotional exhaustion, depersonalization, and reduced perception of personal accomplishment.\textsuperscript{16} Symptoms of burnout are not only associated with poor health outcomes for the individual, but are also shown to negatively impact the quality of patient care.\textsuperscript{17}

Less is known about the role of health information technology (HIT) and electronic health records (EHRs) in either contributing to or mitigating the development of clinician burnout. Therefore, we examined how three HIT-related stress measures—sufficiency of time for documentation, whether the EHR adds to the frustration of their day, and the amount of time spent on the EHR at home—relate to symptoms of burnout among advanced practice providers (APPs) who use EHRs in their clinical practice (Table 6).

APPs who reported insufficient time for documentation had \textbf{4.3 times the odds} of burnout, compared to respondents who reported sufficient time for documentation, after adjusting for the other two measures. APPs who reported that the EHR adds to the frustration of their day had \textbf{3.4 times the odds} of burnout, compared to respondents who did not feel the EHR added to their daily frustration. Time spent on the EHR at home was not significantly associated with burnout when adjusting for the other two measures of HIT-related stress.

Table 6. Adjusted odds of burnout among APRN and PA respondents who use EHRs (N=589)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sufficiency of Time for Documentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Insufficient</td>
<td>4.3</td>
<td>2.8-6.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EHR Adds to Daily Frustration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Yes</td>
<td>3.4</td>
<td>2.1-5.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Time Spent on the EHR at Home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimal/None</td>
<td>ref</td>
<td>ref</td>
<td>ref</td>
</tr>
<tr>
<td>Modest/Satisfactory</td>
<td>1.0</td>
<td>0.6-1.7</td>
<td>( n.s. )</td>
</tr>
<tr>
<td>Moderately High/Excessive</td>
<td>1.3</td>
<td>0.8-2.1</td>
<td>( n.s. )</td>
</tr>
</tbody>
</table>

\textsuperscript{17} Dewa, C.S., et al., How does burnout affect physician productivity? A systematic literature review. BMC Health Serv Res. 2014:14: p. 325.