Home healthcare workers need efficient, reliable access to patient information no matter where they go. That’s why their choice of mobile device is crucial. The right device, such as the Microsoft® Surface™ Pro 3, can make the difference between effective, responsive technology and technology that can impede patient care.

With so many tablet and device choices on the market, it is important to choose a device that is compatible with the home healthcare worker’s unique needs. Prowess Consulting tested two devices a home healthcare worker might use, the 2-in-1 Microsoft® Surface™ Pro 3 and the Apple® iPad Air™. In a comparative analysis, using tasks that home healthcare workers perform every day, we set out to determine which device would best benefit mobile medical professionals.

The Microsoft Surface Pro 3 emerged as the clear winner because it can deliver necessary information faster, and it can decrease the interruptions that technology too often presents to patient care.

The Microsoft® Surface™ Pro 3 outperforms the Apple® iPad Air™ in tests determining the usefulness of tablets for the home healthcare worker.

- **Easier access to critical patient data**
  - Perform any task, such as viewing test results and patient records simultaneously, with impressive three-screen split display.

- **Smother workflow experience**
  - Daily tasks made non-interruptive through natural note taking, optimized productivity tools, and customizable file management.

- **Nearly 2x faster search**
  - Find patient residences nearly two times faster.

- **87% less time waiting for files**
  - Load productivity tools like Excel files from e-mail or cloud-based applications with the power of an Intel processor.
Introduction

Home healthcare workers have long used their devices primarily for e-mails and scheduling. But the home healthcare industry and its technology have evolved, so workflows and needs unique to home healthcare professionals have emerged. Home healthcare workers do not have the advantages of all the tools a hospital or clinical worker might have; their devices need to become much more than simply e-mail and calendaring tools. Technological innovators have responded to this need and are developing solutions specifically for this industry.

The right device in the hands of a medical professional has the power to improve patient care, but only if the device can deliver critical patient data in a better way. Devices that complicate or impede access to critical patient data can become obstacles to patient care. Availability of information is the fuel that powers treatment. When the right information is in the right hands at the right time, healthcare professionals can more quickly devise the right treatments and patients can get the answers they need to make critical medical choices.

Many home healthcare workers opt out of using tablets because they feel tablets might interfere with their ability to connect with their patients. It’s a valid concern, because tablets haven’t exactly been easy to implement into daily workflows. Making a patient wait or repeat themselves while a home healthcare worker troubleshoots technology is not good care. If tablets interrupt patient care, don’t provide a smooth experience, or otherwise negatively affect the patient/healthcare worker interaction, healthcare workers will continue to be burdened by paper printouts, cumbersome files, and heavy reference books.

But there is a way out: the right device can mitigate these problems.

Based on our interviews with medical professionals, we created a day in the life of Kevin, a home healthcare nurse. As part of his daily tasks, Kevin needs to:

- Access critical patient data
- Perform daily administrative tasks
- Locate patient residences

What Difference Could a Device Really Make?

To find out which device would provide the home healthcare worker with the maximum amount of usability in the field, we put the Microsoft Surface Pro 3 head to head with the Apple iPad Air.

Perhaps due to the commercial momentum of Apple® iPad® devices, many business users assume they are the best choice. But it turns out these devices might not be best for the home healthcare workers.
Microsoft® Surface™ Pro 3 Beats the Apple® iPad Air™

The results of our tests reveal that the Microsoft Surface Pro 3 is the better choice for home healthcare workers over the Apple iPad Air. It can provide easier access to critical patient data, it can deliver a smooth, non-distracting workflow experience, and when Internet-connected it can more quickly populate location results.

The Surface Pro 3 has the power to display three interactive screens on one display, which helps streamline and enrich mobile medical care by delivering:

- Easier access to critical patient data through split-screen multitasking
- A smoother, less distracting workflow for administrative tasks
- Fast results for loading files and driving directions

Through industry research and interviews with medical professionals, we created an array of tests to recreate tasks that Kevin, our home healthcare nurse, might encounter in his daily work.

**Access Critical Patient Data**

- Review test results with patients and compare it with a healthy sample view
- Check medication interactions while viewing patient prescription history
- Call a remote physician while consulting a treatment plan, in addition to inviting a third opinion to a video conference
- Research medical conditions while copying and pasting information into a client’s electronic health record (EHR)

**Perform Administrative Tasks**

- Write visitation notes and charting
- Open, edit, store, and access files for filling out timecards

**Navigate to Patient Residence or Local Care Facilities**

- Locate driving directions

The Microsoft® Surface™ Pro 3 has the power to display three interactive screens on one display, which helps streamline and enrich mobile medical care.
A Day in the Life of Kevin, a Home Healthcare Worker

Let’s follow Kevin as he goes about his day, driving to and from appointments and caring for in-home patients.

Easier Access to Critical Patient Data

The three-screen functionality of the Surface Pro 3 helps Kevin avoid common roadblocks to accessing critical information.

Accessing patient data is critical to mobile health care. Kevin is not at a medical facility with an IT team on hand, nor is he a walking medical reference book, so he needs to know he can rely on his technology.

Kevin needs access to critical patient data, and only the Microsoft Surface Pro 3 delivered the medically relevant information in side-by-side screen visibility, a display that can enrich and streamline daily workflow. The Apple iPad Air cannot perform split-screen multitasking.

In short, the Microsoft Surface Pro 3 helps Kevin more easily diagnose, treat, and explain things to his patient. Let’s see how.

Review Test Results with Patient

The Microsoft Surface Pro 3 can split a screen three ways, making visual review of results simultaneous.

Kevin needs a way to go over X-rays with his patient. Using his tablet, Kevin opens the web portal to access the patient’s EHR and selects the most recent X-ray. He zooms in close to the injured area to discuss it with the patient.

While Kevin waits for the X-ray to load, he wants to load another window. Kevin also launches his favorite anatomy app, Visible Body®. He wants to show his patient side-by-side photos—one shows what the spinal column should look like, and the other shows the patient’s injury. Using this visual comparison, Kevin agrees with the patient’s physician that the best course of treatment is physical therapy.

Additionally, Kevin wants to have his client sign off on the treatment plan. He selects the popular signing app DocuSign® and brings up the document for signing directly on the tablet surface.

It is only in the side-by-side view that Kevin can instantly see when his X-ray is fully loaded. This increases his efficiency and can help make the most out of the time he has with his patient. The Microsoft Surface Pro 3 is the only device that can display these three tasks side-by-side. With the iPad Air, Kevin can only display one screen at a time.
Focus on Patient Care with Pain-Free Tablet Technology
How the Microsoft® Surface™ Pro 3 outperformed the Apple® iPad Air™ in the home health care field

Table 1. Comparative display of split-screen functions for three-screen multitasking

<table>
<thead>
<tr>
<th>Microsoft® Surface™ Pro 3 split screen</th>
<th>Apple® iPad Air™ cannot split screens</th>
</tr>
</thead>
</table>

Because Kevin can access three types of critical patient information at once with the Microsoft Surface Pro 3, he can deliver highly informative, comparative care more effectively than with the Apple iPad Air.

Check Prescription Interactions

The Microsoft Surface Pro 3 can deliver critical patient prescription history faster than the Apple iPad Air.

Kevin needs to double-check his patient’s prescription history and interactions. He pulls up the patient chart using the web portal to cross reference with his drug interaction app, Epocrates®. He wants to view these windows side-by-side because it will make it easier to check for accurate information.

Only the Surface Pro 3 supports this comparative view and provides a shorter, more efficient route to the information. Kevin is able to verify his patient’s prescriptions faster than he could with the Apple iPad Air. Additionally, because of the reduced toggling back and forth on the Surface Pro 3, Kevin would likely make less errors in data entry or entering misremembered information from one application to the next.

Table 2. Comparative display of split-screen functions for cross referencing prescriptions

| Microsoft® Surface™ Pro 3 displays two functions on one screen. | Apple® iPad Air™ cannot split a screen, requiring the user to tap back and forth between screens in order to cross-check prescriptions. |
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Additionally, the Microsoft Surface Pro 3 is able to save a split-screen as another single screen. If Kevin navigates to another window, he can easily swipe left to bring back his split-screen, preserved as it was.

This function can help Kevin plan for his visits. The evening before his visit, he could queue up and save this visual to show the patient, which means he will spend less time fussing with his tablet while at the patient’s home. Kevin’s patients are best cared for when he is fully focused on them, not on accessing apps and screens during the appointment.

Because the Microsoft Surface Pro 3 can display three screens at once, Kevin is able to verify his patient’s prescription history faster than he could with the Apple iPad Air.

Consult Remote Specialists
The Microsoft Surface Pro 3 increases the efficiency of remote consultations.

The Surface Pro 3 can run three screens simultaneously, even with functions like Adobe® Flash® or HD video for tasks like video consultations with remote specialists. The iPad not only cannot display more than one screen at a time, but it does not support Adobe Flash for viewing the maximum amount of types of HD video.

Kevin launches Skype® to contact the patient’s physician for a video consultation. During the call, the patient’s physician decides to send Kevin a file. Kevin needs to keep the video running side by side with the document that the physician just sent him. The physician wants to bring in a second opinion, so Kevin adds an additional participant, a specialist, to the call.

Because Kevin can access three types of critical patient information at once with the Microsoft® Surface™ Pro 3, he can deliver highly informed care more effectively than with the Apple® iPad Air™.
Because of its ability to split screen, the Surface Pro 3 was able to deliver information that the iPad Air could not.

**Table 3. Comparative device functionality and display of split screen using Skype®.**

<table>
<thead>
<tr>
<th></th>
<th>Microsoft® Surface™ Pro 3</th>
<th>Apple® iPad Air™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host a three-way Skype® video</td>
<td>✔️</td>
<td>✗</td>
</tr>
<tr>
<td>Receive files in video chat</td>
<td>✔️</td>
<td>✗</td>
</tr>
<tr>
<td>View split screens</td>
<td>✔️</td>
<td>✗</td>
</tr>
</tbody>
</table>

The Microsoft® Surface™ Pro 3 can host a Skype HD video call while simultaneously displaying files sent through the conversation.

Skype® for Apple® iPad Air™ does not support adding participants or sending files through the video conference.

The iPad Air cannot host a group video chat through Skype, receive and save a file sent through that conversation, nor split screen multitask.

The ease with which the Microsoft Surface Pro 3 handles multitasking during the consultation call helps Kevin get back to his patient’s questions instead of having his attention demanded by inefficient technology.

**Research Medical Conditions**

The **Microsoft Surface Pro 3 eliminates the extra time it takes to toggle back and forth between screens.**

Kevin wants to refresh his knowledge of kidney disease, so he opens his medical reference app, Medscape®. He finds the information he needs and selects the text to copy it into the patient’s notes, in addition to sending the patient an e-mail with information about the condition.

If Kevin used an iPad Air for this task, he would be toggling back and forth several times to complete these three functions. But because he used the Microsoft Surface Pro 3, he can display three screens at once, decreasing the time it takes to complete his research and send an email.
Focus on Patient Care with Pain-Free Tablet Technology
How the Microsoft® Surface™ Pro 3 outperformed the Apple® iPad Air™ in the home health care field

Table 4. Comparative display of split screen functionality in three-screen multitasking

| **Microsoft® Surface™ Pro 3** can perform three separate tasks at once by splitting the screen. Here the user’s e-mail, web reference, and notes are displayed side-by-side. | **Apple® iPad Air™** cannot split a screen, requiring extra toggling from the user for any multi-use function. |

Every scenario we tested in which Kevin needed easy access to critical patient data and reference material, the split-screen functionality powered by the Intel® processor of the Microsoft Surface Pro 3 provided better results.

**Smother, Less Distracting Workflow Experience for Administrative Tasks**

After his interaction with the patient is complete, Kevin turns his attention to administrative tasks, including writing visitation notes and timecard reports. The Surface Pro 3 simplifies these tasks, as well.

**Write Visitation Notes**

**Due to 2-in-1 features and natural handwriting functionality, the Microsoft Surface Pro 3 provides Kevin with a smoother, less distracting experience for taking visitation notes.**

Kevin needs to record information about his visitation—notes that will become a permanent part of the patient’s EHR. He usually enters visitation summaries at the end of his day, but it is these real-time notes that help him remember the most accurate information for these reports. He sees 4–5 patients a day and relies on these notes in order to get his reports right—it’s a lot to keep track of.

Though he knows a tablet could streamline this process, he worries about entering a lot of information on a limited keyboard during a visit. He knows he cannot keep eye-contact with his patient, something critical to his level of care, if he is using a touch-screen keyboard.

The Microsoft Surface Pro 3 includes a stylus, which lets Kevin hand-write notes naturally, directly onto the screen, should he prefer a pen to typing, or if he has the need to draw a diagram.
If he prefers typing, he can take notes more efficiently on his Microsoft Surface Pro 3 with detachable keyboard than with the on-screen keyboard of the Apple iPad Air. The keyboard’s lightweight feel allows for easy transportation, and its magnetic mounts allow it to be at an angle for natural typing feel. The kickstand can angle at any position, allowing Kevin to hold the device stably in his lap; the Microsoft Surface Pro 3 now feels more like typing on a laptop than on a tablet.

Table 5. Comparison of form factor and options for the Microsoft® Surface™ Pro 3 and the Apple® iPad Air™

<table>
<thead>
<tr>
<th>Microsoft® Surface™ Pro 3</th>
<th>Apple® iPad Air™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the keyboard and touchpad, the user can do everything on a Surface Pro 3 without ever having to touch the display.</td>
<td>Even with a third-party keyboard, the iPad Air still requires a lot of screen tapping and toggling.</td>
</tr>
</tbody>
</table>

The Microsoft Surface Pro 3 provides a more familiar experience for typing or hand writing, which can eliminate frustrating troubleshooting or interruptive tablet swiping. In order to maintain attentive physical cues like eye-contact, Kevin needs a tactile keyboard or a pen.

Open, Edit, Store, and Access Files for Time-Card Reports

The Microsoft Surface Pro 3 provides a smoother, faster, less distracting workflow experience than the Apple iPad Air because it more easily displays, edits, stores, and accesses files for daily administrative tasks.

The ability to retain productive mobility depends on the toolset available to the home healthcare worker. This not only includes the features and apps mentioned previously, but also a suite of productivity tools, such as the Microsoft® Office suite. Microsoft® Word might be used for items like legal forms or tasks such as note taking, whereas Microsoft® Excel® might be used for submitting expenses or entering time.

Additionally, the necessity of an intuitive and familiar file-management system is an imperative backup plan, in case the Internet provides an unreliable connection to the patient’s EHR and typed information is lost.
Kevin has several administrative tasks to complete in his workday, for which he needs both Excel and file management.

He opens an Excel spreadsheet template from his company to populate his timecard. Often he will open the spreadsheet from his e-mail and other times he uses Microsoft® OneDrive™, a cloud-based storage solution. He needs to cross-reference his calendar to verify his hours for the week. He selects the cells and types in his hours.

As with his earlier tasks, if Kevin wants to access avoid the time-draining back and forth of viewing different screens, and if he wants the full power of Office, he needs a Microsoft Surface Pro 3.

Table 6. Represents the comparative display of split screen functionality for administrative tasks.

Microsoft® Surface™ Pro 3 multi-screen display removes the need for interruptive toggling in administrative tasks like entering time. Apple® iPad Air™ cannot split a screen, requiring extra toggling from the user for any multi-use function.

The Microsoft Surface Pro 3 delivers more features for administrative tasks such as saving files locally and for Microsoft® Office 365™ for Excel than the Apple iPad Air.

Since many home healthcare workers still use laptops, the Microsoft® Surface™ Pro 3 can make the transition to tablets easier because of its familiar use and laptop-like functions.
Focus on Patient Care with 
Pain-Free Tablet Technology
How the Microsoft® Surface™ Pro 3 outperformed the 
Apple® iPad Air™ in the home health care field

Table 7. Comparative study of some Microsoft® Excel® features on the Microsoft® Surface™ Pro 3 and the 
Apple® iPad Air™

<table>
<thead>
<tr>
<th>Microsoft® Excel® Functionality and Features</th>
<th>Microsoft® Surface™ Pro 3 with Microsoft® Office 365™</th>
<th>Apple® iPad Air™ Microsoft® Office for Apple® iPad®</th>
</tr>
</thead>
<tbody>
<tr>
<td>versioning</td>
<td>Editing versions</td>
<td>Directly in selected spreadsheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Must save a version to edit, creating duplicates</td>
</tr>
<tr>
<td>on-screen keyboard</td>
<td>Split keyboard</td>
<td>Docked</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Floating, often visually blocks cells user wants to edit</td>
</tr>
<tr>
<td>file viewing</td>
<td>Zoom level</td>
<td>400%</td>
</tr>
<tr>
<td></td>
<td>View modes available</td>
<td>Multiple</td>
</tr>
<tr>
<td></td>
<td>Split and multiple windows</td>
<td></td>
</tr>
<tr>
<td>data sorting and filtering</td>
<td>Slicers</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Timeline</td>
<td>✗</td>
</tr>
<tr>
<td>conditional formatting</td>
<td>Viewing</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Adding and updating</td>
<td>✗</td>
</tr>
<tr>
<td>data validation</td>
<td>Viewing</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Adding and updating</td>
<td>✗</td>
</tr>
<tr>
<td>pivottables</td>
<td>Viewing</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Adding and updating</td>
<td>✗</td>
</tr>
<tr>
<td></td>
<td>Sorting and Filtering</td>
<td>✗</td>
</tr>
<tr>
<td>macros</td>
<td>Running macros</td>
<td>✗</td>
</tr>
<tr>
<td>external data</td>
<td>Updating files</td>
<td>✗</td>
</tr>
<tr>
<td>comments</td>
<td>Viewing and deleting</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Adding and updating</td>
<td>✗</td>
</tr>
<tr>
<td>keyboard shortcuts</td>
<td>Creating and using</td>
<td>✔️</td>
</tr>
<tr>
<td>information rights management (IRM)</td>
<td>Opening and viewing</td>
<td>✗</td>
</tr>
<tr>
<td></td>
<td>Adding and editing</td>
<td>✗</td>
</tr>
</tbody>
</table>

Neither Apple® Numbers® nor Microsoft® Excel® for iPad provided Kevin with the full array of functions he needed to quickly complete his timecard. Nor did the iPad Air let Kevin locally access a saved file of his timecard. In order to edit an Excel spreadsheet on the Apple iPad Air, Kevin has to save a duplicate. This extra versioning can complicate and confuse Kevin’s file organization. He might not know which timecard is current, which version is a copy or the original, or where each version is stored, because the Apple iPad Air does not allow Kevin to locally access a saved file of his timecard outside of the app in which it was created.
Focus on Patient Care with Pain-Free Tablet Technology
How the Microsoft® Surface™ Pro 3 outperformed the Apple® iPad Air™ in the home health care field

Faster Access to Files
Not only could Kevin do more with his Excel files using the Microsoft Surface Pro 3, he could open those files 8x faster from e-mail and 3.7x faster from cloud services compared to the Apple iPad Air when Internet-connected.

Table 8. Timed test results of each device opening Microsoft® Excel® files

<table>
<thead>
<tr>
<th>How many seconds to …</th>
<th>Microsoft® Surface™ Pro 3 with Microsoft® Office 365™</th>
<th>Apple® iPad Air™ with Microsoft® Office for Apple® iPad®</th>
<th>Speed Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open an .xlsx attachment from Microsoft® Outlook®</td>
<td>1.8</td>
<td>14.2</td>
<td>8x faster using the Surface Pro 3</td>
</tr>
<tr>
<td>Open .xlsx from Microsoft® OneDrive™</td>
<td>1.8</td>
<td>6.8</td>
<td>3.7x faster using the Surface Pro 3</td>
</tr>
</tbody>
</table>

Because of the Surface Pro 3’s hardware advantages, **Kevin’s spent 87 percent less time waiting for his Excel file to open** from his e-mail application and 73 percent less time waiting for his Excel file to open from his cloud storage.

Table 9: Comparison of hardware specs between the Microsoft® Surface™ Pro 3 and the Apple® iPad Air™

<table>
<thead>
<tr>
<th>Processor</th>
<th>Microsoft® Surface™ Pro 3</th>
<th>Apple® iPad Air™</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th Gen Intel Core i5, dual-core, 2.9 GHz</td>
<td>Apple® A7 64-bit, dual-core, 1.4 GHz</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RAM</th>
<th>Microsoft® Surface™ Pro 3</th>
<th>Apple® iPad Air™</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 GB</td>
<td>1 GB</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Microsoft® Surface™ Pro 3</th>
<th>Apple® iPad Air™</th>
</tr>
</thead>
<tbody>
<tr>
<td>128 GB</td>
<td>68 GB</td>
<td></td>
</tr>
</tbody>
</table>

In all instances of our testing, the Microsoft Surface Pro 3 made best use of Office 365 tools to streamline workflow, including the Windows® ability to store and locate files in a more complete and customizable file structure. The Apple iPad Air is not optimized for full functionality in Office 365, nor does it offer customizable management.

Using the Microsoft® Surface™ Pro 3, Kevin spent 87 percent less time waiting for his Microsoft® Excel® attachment to open.
Focus on Patient Care with Pain-Free Tablet Technology
How the Microsoft® Surface™ Pro 3 outperformed the Apple® iPad Air™ in the home health care field

Faster Navigation to Patient Residence

Native map functions on the Microsoft Surface Pro 3 populated driving directions nearly 2x more quickly than the Apple iPad Air.

Kevin needs quick access to driving directions, especially for new patients. Currently, most people use whatever maps are native to the particular device they own. In this case, we tested iOS® maps on the Apple iPad Air and Bing® Maps on the Microsoft Surface Pro 3.

Locate Driving Directions to and from Patient Residences

Kevin can find directions to his patients’ homes twice as fast on the Microsoft Surface Pro 3 than on an Apple iPad Air when connected.

Kevin uses his device to log on to his new patient’s EHR, and he enters the address located within the record into the native map function of his device. He then uses the step-by-step directions to navigate to the patient’s residence.

After his daily visits are complete, Kevin needs to drop off blood samples to the nearest hospital, one he is not familiar with. He opens up the map and enters “From: my location” and “To: Harbor Hospital.”

<table>
<thead>
<tr>
<th>How many seconds to…</th>
<th>Microsoft® Surface™ Pro 3 with native Bing® Maps</th>
<th>Apple® iPad Air™ with native iOS® maps</th>
<th>Speed Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load patient address</td>
<td>1.1</td>
<td>2.2</td>
<td>2x faster using the Surface Pro 3</td>
</tr>
<tr>
<td>Pull up driving route map to hospital</td>
<td>1.0</td>
<td>2.6</td>
<td>2.6x faster using the Surface Pro 3</td>
</tr>
</tbody>
</table>

The Microsoft Surface Pro 3 delivered map data into the Kevin’s hands twice as fast as the Apple iPad Air when Internet-connected.

Home Health Care Primed and Ready for Tablets

Healthcare workers have a lot of work to do outside of patient care. Each visit requires nearly the same time investment in documentation work and record keeping as the actual medical work does.

The Microsoft® Surface™ Pro 3 delivered map data into the Kevin’s hands twice as fast as the Apple® iPad Air® when Internet-connected.
One home healthcare worker we interviewed used his laptop in his vehicle before and after visitations for typing notes, but admitted that he wished his company would invest in mobile devices. He often uses his personal smart phone to show patients online images about their condition.

Smart phones are great for such tasks; however, smart phones might not be enough for more specialized needs, like taking non-interrupting notes at the point of care, or viewing patient X-rays in minute detail. Plus, many of these tasks need to happen simultaneously, and other devices do not support split-screen display.

Tablets can play a key role in a healthcare worker’s ability to boost productivity, provide timely and useful information to patients, and streamline the job to focus less on paperwork and more on patients. Tablets also add convenience by reducing the paperwork, books, and other reference materials and professional resources that home healthcare workers need for their jobs.

Tablets are even more important for mobile medical workers than non-mobile workers because they reduce the likelihood of losing printouts of critical information, which is a big concern in the paper-heavy profession of medicine. Many workers already use tablets to access their company EHR websites. Access to EHR provides medical professionals with patient data that can only be viewed through a secure portal requiring encryption and credential verification. But home healthcare workers need more than just data from EHR and the Internet to do their jobs well. They need to deliver highly informed, highly effective care as quickly as possible.

**The Surface Pro 3 Can Be All Kevin Needs and More**

A mobile device for home healthcare workers is merely a means to an end. The right device is the one that helps these professionals provide the best possible care with the least possible fuss. When put to the home healthcare test, the Microsoft Surface Pro 3 outperformed the Apple iPad Air in:

- Displaying more information at a time for quicker multitasking
- Loading files faster
- Customizable file management
- Delivering a smoother workflow experience
- Navigating to and from locations
- Hardware Specifications

The Microsoft Surface Pro 3 helped Kevin provide better care to his patients by delivering information and functionality on a split screen simultaneously, which means he can more quickly get the information he needs while delivering in-home treatment. The Surface Pro 3 could ultimately replace Kevin’s need for a laptop and can be used in the office, on the go, or at home. The right device does its job and gets out of the way, so healthcare professionals can do what they do best—treat patients.
## Appendix A: Test Environment

<table>
<thead>
<tr>
<th>Device</th>
<th>Operating System</th>
<th>RAM</th>
<th>Storage</th>
<th>Processor</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Screen</th>
<th>Resolution</th>
<th>Browser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple® iPad Air™</td>
<td>iOS® 7.1.2</td>
<td>1 GB</td>
<td>16 GB</td>
<td>Apple® A7 64-bit (APL5698) (dual-core, 1.4 GHz)</td>
<td>9.4 x 6.5 x 0.29 in</td>
<td>1.0 lbs.</td>
<td>9.7&quot;</td>
<td>2048 x 1536</td>
<td>Apple® Safari® browser, version 7.0</td>
</tr>
<tr>
<td>Microsoft® Surface™ Pro 3</td>
<td>Windows 8.1 Pro</td>
<td>4 GB</td>
<td>128 GB</td>
<td>4th Gen Intel Core i5-4300U (dual-core, 2.9 GHz)</td>
<td>11.50 x 7.93 x 0.36 in</td>
<td>1.76 lbs.</td>
<td>12&quot;</td>
<td>2160 x 1440</td>
<td>Microsoft Internet Explorer 11</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maps iOS app</td>
<td>Stock in iOS 7.1.2</td>
</tr>
<tr>
<td>Microsoft Bing Maps</td>
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<td>DocuSign iOS app</td>
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<tr>
<td>Excel for iPad</td>
<td>1.1 (140717)</td>
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</tbody>
</table>

### Network Speed

Unless otherwise indicated, our tests were performed while devices were connected to an 802.11n Verizon 4G LTE Ellipsis Jetpack hot spot. Network throughput fluctuates continually. We recorded network speeds at several points during the testing and averaged the results. Averages are shown here.

- **Upload speed**: 5.95 Mbps
- **Download speed**: 2.84 Mbps
Appendix B: Test Results and Procedures

Split-Screen Multitasking Scenarios

Use case and apps

1. Review test results with patient.
   Apps: Web Portal (screen shot image of Allscripts®), Visible Body®, DocuSign®
   - **Task 1**: Kevin opens the web portal to access the patient’s electronic health record (EHR) and selects the most recent X-ray. He zooms in close to the injured area to discuss it with the patient.
   - **Task 2**: Kevin launches Visible Body to show his patient side-by-side photos.
   - **Task 3**: Kevin launches DocuSign in a 3rd window for patient to sign off on treatment plan.

2. Check prescription interactions
   Apps: Web Portal (screen shot image of Allscripts), Epocrates®
   - **Task 1**: Kevin opens the web portal to access the patient’s electronic health record (EHR) with prescription history.
   - **Task 2**: Kevin launches Epocrates, which has a drug interaction reference check.

3. Consult remote specialists
   Apps: Skype®, Microsoft® Word or .pdf viewer
   - **Task 1**: Kevin launches Skype to contact the patient’s physician for a video consultation.
   - **Task 2**: Kevin receives a file sent via physician during the group chat and views it.
   - **Task 3**: Physician calls in a 2nd opinion—creating a 3 way video conference call.

4. Research medical conditions
   Apps: Browser or Medscape® App, Microsoft® OneNote®, Microsoft® Outlook®
   - **Task 1**: Kevin launches Medscape to look up a condition.
   - **Task 2**: Kevin to copy and paste this information into OneNote for himself to reference.
   - **Task 3**: Kevin launches Outlook in a 3rd screen to paste information in an e-mail to patient.

5. Edit, store, and access files
   Apps: Microsoft Outlook, Microsoft® Excel®, native calendar app
   - **Task 1**: Kevin opens a template in Excel.
   - **Task 2**: Kevin opens his native calendar application to refresh himself on hours worked.
   - **Task 3**: Kevin selects cells to type in his hours while viewing hours in calendar app.
   - **Task 4**: Kevin saves a local copy to the device.

Devices and configurations

1. Review test results with patient
   - For the web portal simulation, we did an Internet search for a screen shot image of an EHR. We used one from Allscripts. These are HIPAA compliant portals and unable to be simulated in testing.
   - For the X-ray simulation, we did an Internet-search for a high-res image of an upper spinal column. Saved to photos.
   - For DocuSign, we created a sample “patient rights” document and saved it to the application or emailed it to ourselves.
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2. Check prescription interactions
   - For the web portal simulation, we did an Internet search for a screen shot image of an EHR. We used one from Allscripts. These are HIPPA compliant portals and unable to be simulated in testing.
   - For Epocrates on iOS®, we downloaded the app from the app store. For Epocrates on Windows®, we navigated to it via Internet Explorer® and created a shortcut on the Windows home screen.

3. Consult remote specialists
   - To simulate a 3 participant call in Skype, we set up three dummy accounts. One on a PC, one for a Windows tablet, and one for iOS tablet. We created a dummy Word docx to send via the conversation. Each device called the PC first, then added the other device as the 3rd participant where able.

4. Research medical conditions
   - For Medscape on iOS, we downloaded the app from the app store. For Medscape on Windows, we navigated to it via Internet Explore and created a shortcut on the windows home screen.
   - For OneNote on iOS, we downloaded the app from the app store and logged in with our Microsoft® Office 365™ credentials for testing. For OneNote on Windows, we downloaded the app and logged in with our Office 365 credentials for testing and created a shortcut on the windows home screen.
   - For Outlook on Windows, we downloaded the app from the app store and set up the mailbox using our testing credentials. For mail on iOS, we set up the native mail account using exchange with our testing credentials.

5. Edit, store, and access files
   - We created a dummy Excel spreadsheet time card and emailed it to our testing account.
     - For Excel on iOS, we downloaded the app from the app store and logged in with our Office 365 credentials for testing.
     - For Excel on Windows, we downloaded the app and logged in with our Office 365 credentials for testing and created a shortcut on the windows home screen.
   - For the native calendar functions, we typed the hours that coincided with the dummy Excel spreadsheet we created.

Procedure for reviewing test results
   - Windows device
     1. Open the patient web-portal. For testing, we took a screen-shot of a web portal image from an Internet search.
     2. Select X-ray and double click to make big.
     3. Tap windows button to launch start.
     4. Tap Visible body.
     5. Tap Atlas and select head and neck view
     6. Drag finger from the left to bring up X-ray and hover over screen until it splits.
     7. Tap windows button to launch start.
     8. Tap DocuSign.
     9. Hover over screen until it splits.
     10. Tap Sign and Send and navigate to document created for patient signature.
     11. Tap Add a signer and enter patient information in prompts.
     12. Select will sign in person.
13. Tap **Add**.
14. Tap **+Myself** to add signing for nurse.
15. Tap **next**.
16. Tap on document to place patient signature fields.
17. Tap **next**.
18. Tap on document to place nurse signature fields.
19. Tap **done**.
20. Tap **Begin**.
21. Scroll down to signature fields and tap **sign** to have patient draw or take photo of signature.
22. Patient signs and taps **adopt**.
23. Tap **done**.
24. Tap **yes** to confirm signing.
25. Tap **okay** to hand device to nurse for signing.
26. Tap **sign**.
27. Tap **done**.

**iOS device**

1. Tap photos to open saved photo of patient web portal. For testing, we took a screen shot of a web portal image from an Internet search.
2. Scroll in photos to find saved X-ray photo, tap to zoom.
3. Press the home button.
5. Tap to launch Visible Body.
6. Tap **Atlas** and select **head and neck** view.
7. Tap the home button.
8. Navigate to native mail app.
9. Tap to launch mail.
10. Tap email where dummy document is attached.
11. Long tap on the attachment and select **Open in DocuSign**.
12. Tap **save to library**.
13. Tap to select document.
14. Tap **sign and send**.
15. Tap **add a signer**.
16. Enter full patient name and email.
17. Tap **In-Person Signer**.
18. Tap **done**.
19. Tap **+ME**.
20. Tap **Next**.
21. Tap on document to place patient signature fields.
22. Tap **place fields** for nurse name.
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23. Tap on document to place nurse signature fields.
24. Tap sign.
25. Confirm that you’ve finished adding signature fields and tap sign.
27. Scroll down to signature field and tap sign.
28. Tap draw or take photo of signature.
29. Draw signature and tap adopt.
30. Tap finish.
31. Tap confirm signing.
32. Tap begin signing to have nurse sign.
33. Scroll down to signature field and tap sign.
34. Tap finish.
35. Tap confirm signing.

Procedure for checking prescription interactions
• Windows device
  1. From home screen, tap photos to launch screen shot of patient EHR. For testing, we took a screen shot of a web portal image from an Internet search.
  2. Tap home button.
  3. Tap to launch Internet Explorer from home menu.
  4. Drag finger from the left and hover over screen until it splits.
  6. Tap interaction check.
  7. Tap in search bar add a drug.
  8. Type actos, lisinopril, lipitor, and zantac according to patient record.

• iOS device
  1. From the home screen, tap photos.
  2. Navigate to screen shot of patient EHR. For testing, we took a screen shot of a web portal image from an Internet search.
  3. Tap home screen.
  4. Navigate to Epocrates app.
  5. Tap interaction check.
  6. Tap in search bar.
  7. Toggle back to patient EHR to confirm first prescription name.
  8. Toggle back to Epocrates and type in actos.
  10. Toggle back to patient EHR to confirm second Rx name.
  11. Toggle back to Epocrates and type in lisinopril.
  12. Tap return.
13. Toggle back to patient EHR to confirm third Rx name.
14. Toggle back to Epocrates and type in *lipitor*.
15. Tap **return**.
16. Toggle back to patient EHR to confirm fourth Rx name.
17. Toggle back to Epocrates and type in *zantac*.
18. Tap **return**.
19. Tap **View all** to view interactions.

Procedure for consulting remote specialists
- **Windows device**
  1. From the home screen, tap **Skype**.
  2. Tap contact to select.
  3. Tap video icon on lower left.
  4. During call, recipient taps +.
  5. Tap **sent files** to receive file.
  6. Tap **download file** in chat box.
  7. Tap to launch file.
  8. Drag finger from the left and hover over screen until it splits.
  9. Tap + and **add recipients**.
 10. Tap on contact name.
 11. Tap **add participant**.

- **iOS device**
  1. From the home screen, tap **Skype**.
  2. Tap on contact to launch menu.
  3. Tap **video call**.
  4. During call, recipient taps + to add a file.
  5. Tap on conversation icon to receive only a notification of file sent, but no file available to download.

Procedure for researching medical conditions
- **Windows device**
  1. From the home screen, tap **Internet Explorer**.
  2. Type **www.medscape.com/nurses**.
  3. Tap in search bar and type *Chronic Kidney Disease*.
  4. Tap Windows button.
  5. Tap to select desktop.
  6. Navigate to Internet Explorer.
  7. Drag finger from the left and hover over screen until it splits.
  8. Tap in URL bar and type **www.thevisualmd.com**.
  9. Type into search bar *chronic kidney disease*. 
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10. Tap to view video Intro to chronic kidney disease.
11. Tap windows button
12. Tap to open Outlook
13. Launches window, select where to place it for 3-screen viewing
14. Tap + icon in upper left to compose a new mail message
15. Type in patient email address
16. Long hold to paste information
17. Tap mail icon to send

• iOS device
  1. From the home screen, tap Medscape.
  2. Tap reference.
  3. Tap in search and type Chronic Kidney Disease.
  4. Long hover to select and copy text.
  5. Tap home button.
  6. Tap to open Apple® Safari®.
  8. Type into search bar chronic kidney disease.
  9. Tap to view video Intro to chronic kidney disease.
10. Tap home button.
11. Tap mail.
12. Tap pencil on paper icon to compose a new mail message.
13. Type in patient email address.
14. Long hold to paste information.
15. Tap send.

Procedure to edit, store, and access files
• Windows device
  1. From the home screen, tap to open Outlook.
  2. Navigate to e-mail with Excel spreadsheet attachment.
  3. Long hold on attachment and tap Open with Excel.
  4. Tap Windows button.
  5. Tap to open calendar app.
  6. Drag finger from the left and hover until screen splits.
  7. Tap on cells to enter and edit hours.
  8. Save a copy in Documents/Time Cards.
  9. Close all applications by swiping down from top.
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• iOS device
  1. From the home screen, tap to open native mail app.
  2. Navigate to e-mail sent with Excel spreadsheet attachment.
  3. Long hold on attachment and select Open in Excel.
  4. Tap on spreadsheet and select Duplicate in order to save a local copy for editing.
  5. Tap home button.
  6. Tap to open the native calendar app.
  7. Toggle back to Excel spreadsheet to enter hours.
  8. Tap on cells to enter and edit hours.
  9. Toggle back to calendar to confirm hour entry is correct.
  10. Tap save.
  11. Tap iPad to save locally.
  12. Close all applications by pressing home button twice and swiping program up.

---

<table>
<thead>
<tr>
<th>Results Scenarios for Split-Screen Viewing</th>
<th>Apple® iPad Air™</th>
<th>Microsoft® Surface™ Pro 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Review test results:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Zoom in on high-definition X-ray</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Launch Visible Body® in a second window</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>3. Launch DocuSign® in third window</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>4. View three screens at once</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Check Rx interactions:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Open web portal</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Open Epocrates® in a second window</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>3. View two screens at once</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Consult remote specialists:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Launch Skype® video conference</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Send or receive a file during a video conference</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>3. View conference and file in two screens</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>4. Add participant to conversation</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Research medical conditions:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Open Medscape® app or through the browser</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Open browser in second window to view side-by-side</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>3. Open Microsoft® Outlook® in third window to send e-mail to patient with information</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>4. View three screens at once</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td><strong>Edit, store, and access files</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Open Microsoft® Outlook® and download Microsoft® Excel® spreadsheet attachment</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>2. Open native calendar app in second window</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>3. Edit cells while referencing calendar side-by-side</td>
<td>Fail</td>
<td>Pass</td>
</tr>
<tr>
<td>4. Save a copy to access later</td>
<td>Fail</td>
<td>Pass</td>
</tr>
</tbody>
</table>

*Microsoft® Excel® for Apple® iPad® can save the file to iPad, but the file remains locked inside the application and not accessible via local means.
Open and Edit Files

Devices and configurations

1. For opening a Microsoft® Excel® spreadsheet in e-mail:
   - From alternate e-mail addresses, send eight different e-mails to your test address and to avoid caching of the Excel spreadsheet.

2. For opening an Excel spreadsheet from Microsoft® OneDrive™ for editing:
   - Open OneDrive.com and sign in with your Microsoft® Office 365™ credentials.
   - Upload eight copies of the Excel spreadsheet for testing—to avoid caching of the Excel spreadsheet.

Procedure for opening Excel spreadsheet from Microsoft® Outlook®

- Windows® device
  1. Open the mail app from the home screen.
  2. Start the timer and double tap the attached Excel spreadsheet.
  3. When the spreadsheet is fully displayed, stop the timer and record the result.
  4. Close both applications.
  5. Repeat desired number of instances for testing (eight in this case).

- iOS® device
  1. Open the Mail app from the home screen.
  2. Start the timer at the same time you tap on the e-mail message containing the Excel spreadsheet attachment (download begins automatically).
  3. Tap to open the attachment and select Open in Excel.
  4. When the spreadsheet is fully displayed, stop the timer and record the result.
  5. Select back arrow, and select don’t save.
  6. Double-click home button and swipe up to close both applications.
  7. Repeat desired number of instances for testing (eight in this case).

Procedure for opening Excel spreadsheets from Microsoft OneDrive for editing

- Windows device
  1. Open the Excel desktop app from the home screen.
  2. Tap Open Other Workbooks.
  3. Navigate to OneDrive.
  4. Navigate to Excel spreadsheet.
  5. Start the timer and tap Open to open the Excel spreadsheet.
  6. When the Excel spreadsheet is fully displayed, stop the timer and record the result.
  7. Close all applications.
  8. Repeat desired number of instances for testing (eight in this case).
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- iOS device
  1. Open the Excel app from the home screen.
  2. Tap Open and select OneDrive.
  3. Start the timer and tap to open the Excel spreadsheet.
  4. Select edit.
  5. When the Excel spreadsheet is fully displayed and cells are editable, stop the timer and record the result.
  6. Select back arrow and select don’t save.
  7. Close all applications by double-clicking on home button and swiping up on application.
  8. Repeat desired number of instances for testing (eight in this case).

### Averaged Results Timed Scenarios (Seconds)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Apple® iPad Air™</th>
<th>Microsoft® Surface™ Pro 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open an .xlsx attachment from Microsoft® Outlook®</td>
<td>16.27</td>
<td>2.08</td>
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<tr>
<td></td>
<td>15.07</td>
<td>1.70</td>
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<td></td>
<td>14.47</td>
<td>2.20</td>
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<td></td>
<td>11.72</td>
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<tr>
<td></td>
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<td></td>
<td>13.74</td>
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<td>1.45</td>
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<tr>
<td></td>
<td>10.09</td>
<td>1.44</td>
</tr>
<tr>
<td></td>
<td>6.40</td>
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<td></td>
<td>5.74</td>
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<tr>
<td></td>
<td>6.27</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td>6.53</td>
<td>2.33</td>
</tr>
<tr>
<td></td>
<td>5.93</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>6.80</td>
<td>1.84</td>
</tr>
</tbody>
</table>
Navigation and Maps

Devices and apps

- Windows® device: native Bing® Maps
- iOS® device: native iOS® maps

Procedure for timed testing of location services

Time to populate results to destination address:

- Windows device
  1. From the start screen, tap to open Maps.
  2. On the bottom left, click the three dots to launch navigation menu.
  3. Select My Location.
  4. Verify location is correct.
  5. Tap into search and get directions.
  6. Enter destination address: we used a dummy address for testing purposes, assuming patients’ information will only be available through their EHRs.
  7. Simultaneously start timer and tap search.
  8. Stop timer when address appears as found.
  9. Repeat desired number of instances for testing (eight in this case).

- iOS device
  1. Tap the Maps application.
  2. Tap arrow in bottom left to verify current location.
  3. Tap into the search or enter an address bar.
  4. Enter destination address: we used a dummy address for testing purposes, assuming patients’ information will only be available through their EHRs.
  5. Simultaneously start timer and tap search.
  6. Stop timer when location appears.
  7. Repeat desired number of instances for testing (eight in this case).
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Time to populate driving directions to local hospital:

- Windows device
  1. From the start screen, tap to open Maps.
  2. Tap directions.
  3. On the bottom left, click the three dots to launch navigation menu.
  4. Select My location for A.
  5. Verify location is correct or manually type in if not.
  6. Type Harborview Hospital into B.
  7. Simultaneously start timer and tap route.
  8. Stop timer when full route appears.
  9. Repeat desired number of instances for testing (eight in this case).

- iOS device
  1. Tap the Maps application.
  2. Tap arrow in bottom left to verify current location.
  3. Tap directions.
  4. Type current location in Start.
  5. Type Harborview Hospital in End.
  6. Simultaneously start timer and tap Route.
  7. Stop timer when full route appears.
  8. Repeat desired number of instances for testing (eight in this case).

<table>
<thead>
<tr>
<th>Averaged Results Timed Scenarios (Seconds)</th>
<th>Apple® iPad Air™</th>
<th>Microsoft® Surface™ Pro 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to locate patient address:</td>
<td>iOS® maps</td>
<td>Bing® Maps</td>
</tr>
<tr>
<td>2.35</td>
<td>1.20</td>
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<td>2.10</td>
<td>1.13</td>
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<td>2.16</td>
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<td></td>
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<td>2.07</td>
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<td>1.87</td>
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<tr>
<td>2.02</td>
<td>0.97</td>
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<tr>
<td><strong>2.24</strong></td>
<td><strong>1.12</strong></td>
<td></td>
</tr>
<tr>
<td>Time to display route from “my location” to “Harborview Hospital” :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.56</td>
<td>0.97</td>
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<tr>
<td><strong>2.61</strong></td>
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</table>
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1 “Kevin” is a fictitious composite persona based on our interviews with actual home healthcare workers and other mobile medical professionals.

The analysis in this document was done by Prowess Consulting and commissioned by Intel.
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