



Device Dilemma

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Within any given hospital there are hundreds of electronic devices being used for various reasons. These devices are essential for daily operation, and with so many options, the hospital has a very complicated task of shifting through alternatives and making a decision regarding which types and quantities of these devices to purchase. In addition to fulfilling functionality requirements, the hospital must also ensure that electronic devices are user-friendly in the eyes of the nurses, CNA's, physicians, and therapists who work with them. These are a few of the challenges faced by implementation teams at various hospitals, medical centers, and outpatient clinics throughout the country.

In an attempt to work through these challenges, interesting information and suggestions have surfaced from teams at several representative hospitals (university and community, outpatient clinicals, and emergency departments). For example, at a community hospital in the eastern United States, a Technology Fair was held with two objectives: to give the staff an opportunity to sample several different devices and give them access to the new system being implemented. The turnout was great and most of the hospital's departments were represented. After the test drives, the staff was asked for feedback on the devices in correlation to their workflows. In the end, the fair generated valuable and interesting insight and comments. Discussing device options with Dell Motion representatives was another way of gleaning helpful information that pertained to the questions above. The following are four of the most commonly used devices, some of the important issues surrounding each, recommendations for the C5 tablet and a guide to deciding which devices are appropriate for whom and where.

Most Commonly Used Devices

WOWs (workstations on wheels) — are, just as their previous name states: computers on wheels. There are commonly used and stored in areas other than the nurse's station.

Advantages of the WOW include:

- Large monitor, allows clinicians to see and read with ease
- Ease of mobility, these carts can be taken almost anywhere from patient's rooms to the nurses station to waiting areas and lounges
- Shelve/baskets, convenience of having storage readily available

Disadvantages of the WOW include:

- Mobility, being able to cart these devices around can cause clutter where space is limited.
- Top-heavy, WOWs tip over easily especially when going from tiled floors to carpeted areas.

Laptops, are portable computers that are hand carried with a case.

Advantages of Laptops include:

- Easy to move around
- Larger monitor, which has the same benefits as the WOW

Disadvantages of Laptops include:

- Weight, they are heavier than the C5 Tablets
- Mobility is slightly hindered because you need a case to move it around

C5 tablets, mobile clinical assistants, that have similar functionality to a PDA

Advantages of the C5 Tablets include:

- A variety of ways to dock which provide several options for using the device including a station that allows normal PC functionality with a keyboard and mouse, a station on a mobile computer cart (incorporating the advantages of the WOW), a station mounted to a vital signs pole, and a charging station with security locks.
- Mobility, as mentioned
- Weight, they are easy to carry and lighter than laptops and WOW's
- User friendly (the screen rotates, the battery pack is easy to check, it is easy to disinfect the tablet)
- Built in Camera and Scanning capabilities set this device apart as well

Disadvantages of the C5 Tablet include:

- Smaller screen makes it difficult to read
- Learning curve involved with using the stylus, which has three options: cursive hand writing, printing words, and/or letters
- Size/shape make it difficult to carry while juggling medicines and other items, clinicians commented that they set the tablet down to document

Desktop PCs, computers that remain fixated in one place.

Advantages of a Desktop PC include:

- Increased computer power, the PC power is twice that of the C5 Tablet
- Faster response time, giving the direct cable connection to the network
- Large monitor, keyboard, and mouse all make a desktop more user friendly

Disadvantages of the Desktop PC include:

- Require large amounts of space
- Lack of mobility

Issues

Network Connectivity

Inadequate network connectivity is a major cause of slow response time when using WOWs, laptops, and C5 tablets. At a major university hospital, the nurses were frustrated when they first started using the C5 tablets. They experienced delays from 10 to 30 seconds, causing them to re-enter the value several times, only to find later (after the system caught up) that several values were entered instead of one. Logging on was also a problem, especially if the users needed to first log onto Windows, and then into the application.

With the C5 tablet and stylus use being new to many (if not all) of the staff, it took a long time for them to enter their user names and passwords twice. Adding slow network connectivity to the mix, frustration levels became very high.

eMAR / Pyxis®

Nurses using the Pyxis® machine complained that they had to log in three times: once when logging into Eclipsys Sunrise Clinical Manager (SCM) to prep meds, a second time when logging into Pyxis®, and a third time when documenting administration at the bedside, again in SCM. Special attention should be given to single sign on ability in cases like these.

Mobile Device Repairs / Problems

In February 2008, a Dell Motion representative spoke about how often the C5 tablets are returned for repair, as a result of dropping or other causes. He stated that an independent study recently conducted on multiple mobile devices, including the C5 tablet, concluded that failure rates were based on all kinds of problems and causes:

- Notebooks had approximately a 10% failure rate, with some use by healthcare staff.
- Convertibles (monitors that flip) had > 10% failure rate. However, the majority of them are not being used in healthcare facilities.

- Slates (mostly tablets) are more durable and reliable, and are used more often in the healthcare setting. They have < a 10% failure rate.

C5 Tablet Recommendations

Recommendations made by university hospital nurses included the following:

- Set up applications to use more checkboxes and radio buttons, and fewer text fields.
- Providing adequate training is vital. Training must include calibration of the pen and use of the button on the side of the pen for right-clicking.
- Use bar coding option so less documentation is needed, thus decreasing time involved in charting med administration.
- Setting up a docking station with keyboard and mouse in the patient room or mounting the tablets on carts was strongly recommended.
- Ensure that every docking station includes an extra battery pack.

Recommendations made by hospital IT staff included the following:

- Automatic logon with fingerprint recognition, RFID reader, or ID badge. However, there have been issues with the use of badges, for example; computers logging users into the system as they walked by desktop PCs. Be sure to double check the proximity settings.
- Use WPA or WPA2 for secure connections / authentication.
- Ensure that you have a robust wireless network infrastructure. Access the network prior to a device decision.
- Updating the BIOS and creating a standard image, excluding unnecessary programs, helps to decrease response time.
- Configure the image to define appropriate screen brightness, so users do not need to adjust the dashboard settings.

What to Use Where?

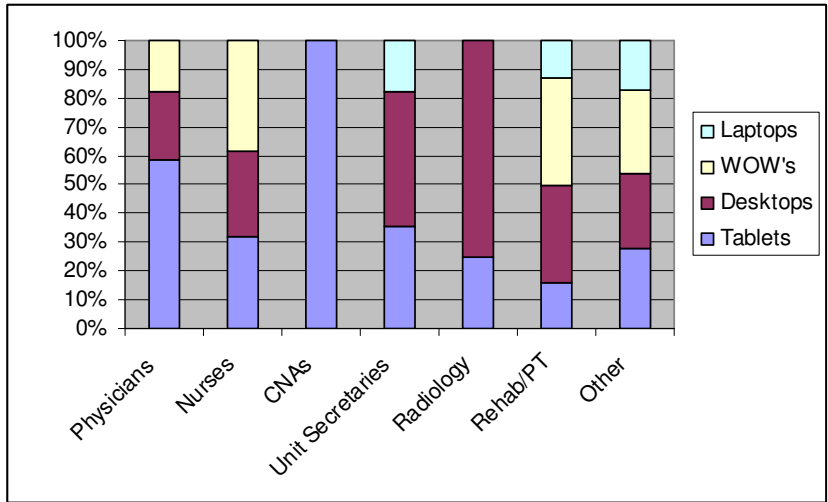
This is the million dollar question that plagues all implementation teams when analyzing hardware and device needs for the various units and areas of the hospital. A lot depends on whether clinical documentation is being implemented with the new electronic patient record, or not. If the users will be charting on H&Ps, Discharge Summaries, Operative Reports, Admission Assessments, I&Os and other flowsheets electronically, you will definitely need additional devices. With point of care documentation, and if budgets allow, hospitals are often choosing to provide one device per user, with visiting clinicians bringing their own.

One team's solution was to investigate the numbers of staff working in the nurses' station and unit at one time, by conducting a survey over a period of time. Others decided that the best option was to provide hand-held devices to the clinicians and staff who moved from floor to floor of the hospital to perform patient care – such as physicians, respiratory therapists, case managers, physical and occupational therapists.

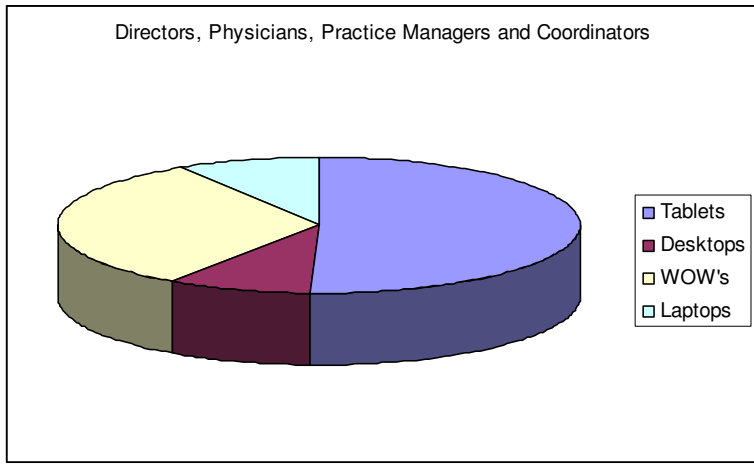
As mentioned earlier, a recently conducted Technology Fair at a community hospital proved to be very beneficial. The IT staff received valuable comments about the various devices, where best to use them, and by whom. One of the staff's main concerns was that an adequate number of devices would be available when they needed one. The fair provided an opportunity to get a consensus and buy in on the devices.

During the two-day event, physicians, nurses and many other clinicians and hospital staff from various departments attended. On the feedback forms, the 126 participants could select more than one device that they would like to use at go-live, with the following results:

Inpatient



Outpatient Clinic



Critical Care Units

Desktop or laptop computers are often used in critical care areas, for obvious reasons; the enormous amount of documentation needed, and almost continuous monitored care. They are often mounted on the wall, with the keyboard and mouse on a swivel shelf/arm. If space is available and the patient rooms are set up for it, WOWs can be used instead of the wall mounted PC, and a couple of extra mobile devices (tablets or WOWs) are often available for use as well.

Acute Care Units

Many hospitals use a mixture of devices in acute inpatient areas, with the typical being 2-4 desktops at the nurses stations, 2-4 tablets, and 2-4 WOWs, depending on the size and makeup of the units.

Emergency Departments

Again, a mixture is generally used—depending on which area of the ED. Trauma and critical patient areas frequently had wall-mounts, while the staff in the acute and fast-track areas used tablets or WOW's, as well as desktop PCs in nurses stations and where space was available.

Outpatient Clinics

Depending on desk and/or wall space in the patient exam rooms, desktops or laptops are often mounted on walls, monitors suspended on arms, with a keyboard and a mouse on the top of the desks. However, tablets are also being used. They are brought in by the care provider and docked in the docking station, with a keyboard and mouse available for use. Based on my experience, WOWs

are seldom used in patient exam rooms due to their large size, but due to their versatility, can be very useful in triage areas or specialty outpatient areas, such as chemotherapy clinics.

In Conclusion

The bottom line is that each and every hospital, medical center and outpatient clinic is unique. Each facility has its own culture, space limitations, budget constraints and specific needs within the various departments. A recommendation will be strongly dependent on the level of a staff's computer skills. Those who are savvy computer users often will opt for the newest technology, while the others want to stick to the old reliable. There is no rule-of-thumb that all facilities can follow, or one solution that fits all. These are exciting times for hospital technology, and the options are many, which in the end, provides opportunities to improve clinicians workflow and increase patient safety. Good luck!

If you have questions on this topic or would like further information please contact us at (610) 444 1233 or visit our website at www.getvitalized.com.