RUNNING A PAPERLESS PRACTICE

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Running A Paperless Practice Using AVImark Software

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More and more veterinarians are trying to improve their efficiency through the use of electronic medical records. Establishing a "paperless" (more correctly "less paper") office has the advantages of:

- ✓ Significantly improved medical record keeping; easier access, better readability
- ✓ Improved intra-office and client communications
- ✓ Significantly reducing time and expense associated with filing paper files
- ✓ Remote access to records

Historically problems with network stability, hard drive storage, speed of access, and data integrity has made this goal difficult, if not impossible, to achieve. Over the past few years the barriers to achieving this goal have rapidly diminished. We now have very stable networking operating systems and hardware coupled with inexpensive high-speed computers and mass storage devices that have made these problems manageable.

Paperless practice is no longer a pipe dream, but a reality evidenced by the fact that I and many other AVImark users have been running paperless for years (I started in 1990). While it does take some determination, it is not difficult to do and the rewards it brings far outweigh any effort that you might invest in it.

As a practice manager or owner, there are number of things to consider prior to undertaking this project.

1. Is the owner of the practice open to the concept?
2. Are the doctors comfortable with computers?
3. Is there space in the exam rooms to accommodate terminals?
4. Is the staff prepared to give up old habits?

If the owner of the practice is not behind this project you may as well stop right now. Without their support, it is highly unlikely that this project will be successful. Dealing with doctors can be a challenge in multiple doctor practices, particularly if they are computer phobic. There are ways around this, which we will deal with later.

Space in the exam rooms is becoming less of a problem as flat screen monitors, tablet PCs, and laptops become more affordable. Most exam rooms can be retrofitted to accommodate today's low profile computers. Transitions can become difficult if they are not planned properly. However, with proper planning, almost every staff member will make the transition to paperless records effortlessly and once they've been converted will be very happy that they did so.

Equipment Considerations

⚠ *Due to changing technology, the hardware and operating systems referenced in this document may be outdated. For the most current recommendations regarding hardware, software, and networking solutions, contact Henry Schein Veterinary Solutions at (855) 478-7920 or email hardware@henryscheinvet.com.*

In order to have effective electronic medical records, you must be certain that these records are safe from data corruption and loss of data. There many strategies to accomplish this and they all begin with obtaining quality components in your network. Today's computers are very inexpensive compared to just a few years ago and it

is very simple to obtain high quality components at a reasonable cost. Contact Hardware Sales at Henry Schein Veterinary Solutions for information about the hardware they have to offer. Call (855) 478-7920 or email hardware@ henryscheinvet.com.

When you're planning a network be sure to place computers at every point in the hospital that you anticipate needing to access medical records. In our hospital, we have three computers at the front desk, one computer in each exam room, one computer in the pharmacy, one in the treatment area, one in the surgery and surgical prep areas, and one computer for each doctor, in their offices. Once you have ascertained how many computer workstations you'll need, you can then select your network switch. This is the device that will carry the traffic to and from the network workstations and the server. Note that I said switch, instead of hub. Switches have much faster throughput than you can expect from a hub and they are well worth the slightly increased cost. Typically switches are configured in multiples of 4 ports, so you could find one with 4 ports, 8 ports, 16 ports, 24 ports etc. Always choose a switch with more ports than you think you need as they tend to fill up.

When wiring the hospital, be sure to use top quality network cabling - Cat 5E or higher. When you are having your clinic wired, be sure to pull cables for networked printers to all the sites you may envision using a printer. Many printers can be attached to Windows® workstations and then shared on the network, but most heavy duty laser printers have built in Ethernet cards and work well attached directly to the network.

There have been variable results within the AVImark user group with the use of wireless devices to access AVImark. If you are going to attempt this, be sure that your router is at least an IEEE 802.11N level and that the wireless cards in the devices can support this level of traffic. Some people have had success with tablet computers and/or iPad or Android devices. In these cases, my experience is that it is best to connect the wireless device to the network using terminal services. There are apps for iPad and Android which allow this type of connection. I have used one called RDP (remote desktop protocol) with success. In this configuration, the computing is all done on the server and only the screen data has to be transferred and so you can get a very functional experience. Note that this app is available on iPhones and Android phones as well, and I have, in a pinch, logged into my server and used AVImark from anywhere you can get a Wi-Fi signal.

Now that we know the general configuration of the network, we can turn our attention to the network server. The server's purpose is to handle all the traffic from the workstations to and from the AVImark Program. It should be used strictly as a server and not as an access workstation for AVImark. The operating systems that are available to run your server vary from Windows server, Windows 7 pro and Linux. Each has its pros and cons but most people find that using either Windows server, or Linux give the best stability and speed. Networks under 10 workstations can use Windows 7 Pro or higher but some people have had problems associated with them. Recently a number of people have been successful using network appliance servers such as snap servers. There have been discussions regarding this on the AVImark users board at groups.yahoo.com.

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In our hospital we use Windows server 2003 with good success, however, it is more costly than other alternatives. If I were to be configuring a new server today, I would probably use Linux with a Samba interface. If you're not computer savvy, it is well worth the investment to have a network specialist help you plan and implement your network. One final word, many people use Windows Server or Linux on the server and then use terminal services licenses to allow access to the server from "dumb terminals". People using this configuration report some speed improvements over standard networking because all of the processing is done on the server and the information is simply painted on the screens of the dumb terminal. Again, a hardware guru might be the best person to go through the pros and cons of each.

Ideally your server computer should be configured as a server, which means that it may have redundant power supplies, multiple hard drives and higher quality workmanship. Again, the cost of hardware has come down to a

point that makes servers very affordable. The server should have 4-8 GB of RAM, and at least 80 GB available hard drive. The processor should be Dual or Quad Core and can be configured with up to 4 processors running in tandem, however, more processors doesn't necessarily mean faster response from AVImark. You should be sure that the hard drives are the fastest possible (7200 or 10,000 rpms or better). In terms of insuring your data stability, configuring your server in a raid configuration (raid 5 or raid 1 are preferred) is a good idea. The raid array means that there are multiple hard drives either mirroring your data, or spanning the data across multiple drives. Speak with the AVImark Hardware Specialist for more information.

Your server, and probably all of your workstations, should be protected with an uninterruptible power supply (UPS). If possible, it is ideal to have the server on an isolated circuit with an independent ground coming from your main panel.

Even in the best of circumstances, a server may malfunction. Therefore, one should always have at least one other high-quality machine to act as a backup server. This machine can be used routinely as a workstation, and then be converted to the server if the main server should die. Many people find that network appliance servers are excellent for this role although they cannot be used as workstation.

One thing that is very important in configuring your network and that is to use high-quality network cards in all workstations. It is preferable to use the same brand in all workstations and, if possible, even the same model number. Historically, there been more problems associated with network cards than any other issue. As the cost of 1 GHz network cards becomes more affordable, it would be a good idea to configure your network at the 1 GHz speed. They should afford you blazingly fast access to your data. If you do move to 1 GHz cards, remember that you will need a 1 GHz switch as well. Be sure that all the ports on your switch can accommodate 1 GHz transfer, as many switches have only one high speed port while the others are 100MB ports.

It is a good idea to have a networking cable strung through the hospital by an electrician well versed in network cabling. This is particularly true if you move to 1 GHz throughput.

With respect to your workstations, they should be configured with a minimum of 2GB ram if you are running Windows 7 pro or higher, 100GB or more hard drive, and a Pentium 2.5 GHz processor or better. You should have at least a few dvd/cd rw drives in the hospital, and if you are going to use dvd rw for your backup, then you need a dvd rom or rw on at least one additional machine. Your screens need to be able to support 1024 by 760 resolution and should be at least 17 inches working diameter. Larger screens can be helpful, especially at the reception desk where you can display the appointment schedule on one side of the screen and AVImark proper on the other. I use two 24in monitors connected to my own workstation so I can multi-task more readily.

Your server should be configured with a DVD rewritable drive and at least one other machine in the hospital should have the same. This will give you the most flexibility in your backup strategies.

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Although we are aiming for a paperless environment, we will still need printers to make labels, invoices, reports etc.. Most practices will need at least one laser printer, and two label printers. It is preferable to have an additional laser printer for the times when your primary is compromised, or when you're trying to print long reports. There are a number of lasers better known to work well with AVImark. Many AVImark users have been successful using the Tektronix color laser provided for free by Xerox. The free color printer program details are available at www. freecolorprinters.com. Other people have been successful with HP printers. It is best to have the laser printer configured as a network printer so that it can be attached directly to your network switch and does not rely on a functional computer to make it work. For labeling purposes, the DYMO Label Writer Turbo 330 is a thermal printer that is recommended by AVImark. It has a very small footprint and creates labels very quickly. Once you become paperless, you'll find that you use labels extensively throughout the hospital; hence, the need for more than one

printer (one dedicated to pharmacy labels and another for other hospital related labels). Multi-function lasers can give you the option to copy, scan and fax from one machine and will come in handy in most offices.

Backing Up Your Data

Your data is the lifeblood of your clinic and, therefore, you must protect it with a comprehensive backup strategy. The strategy should include:

1. Nightly backups of AVImark data, photos and forms to removable media, using a different disc for each night of the week. These disks should be taken off-site nightly. 4-8 GB flash drives work very well for this as can DVD/RW. Data Vault offers an automatic off site backup service and you can call (877) 838-9273 ext. 596 if you'd like more information about this service.

2. Nightly copying of the entire AVImark directory along with your forms and photos directory to alternate workstations in the hospital. Please note that if you use the client server feature, do not have copies of your AVImark folder on any computer to avoid the change that data could be entered into the wrong AVImark folder. These can be accomplished using commercial software such as NTI backup, Retrospect, file back PC (filebackpc.com) and others. We use a freeware program called Cobian backup (www. cobiansoft.com).

3. Mirroring the hard drive on your server to a second hard drive will prevent loss of data from drive failure. Making one of the drives hot swappable and having a hot swap bay on the second computer will allow for very fast recovery should the server die.

4. There are software programs available that will mirror the AVImark directory across the network and that gives you an added level of security.

5. Backups on removable media should be tested weekly.

6. With external hard drives being so inexpensive, I recommend connecting two to your server. Set up directories on each as follows:

    a. Backup Mondays

    b. Backup Tuesdays

    c. Backup Wednesdays

    d. Backup Thursdays

    e. Backup Fridays

    f. Backup Saturday

    g. Backup Sundays

    h. 1st of the Month

    i. 15th of the month

Then set your software to copy to each folder on the appropriate day. In this manner, you have backup data for a full week, as well as archives from the 1st and 15th. If you have bad data, you can easily go back in time. I know this all sounds almost ridiculous in its redundancy, but I can't tell you how many times one or more backup strategies fail.

7. Every month an archives should be made and placed in a bank vault.

8. Finally, you should have offsite backup on the web. AVImark offers this service, or you can look into Carbonite, Mosey, Crashplan or other commercial backup systems. This is the ultimate in disaster protection, but remember that you have a lot of data and if you have to rebuild from the web, it may take days to get all the data downloaded, hence, all the onsite backups.

Goals of a Paperless Practice

When converting to a paperless practice scenario, we should take a look at what our long-term goals are and then develop a strategy to attain those goals in the stage fashion.

When we say that we are becoming paperless, this means that we are attempting to minimize the amount of record keeping that is done on paper. Therefore, we can allow the computer to do the following tasks:

1. Appointment scheduling
2. Boarding calendar scheduling
3. Monitoring patient treatments
4. Medical record entry
5. Medical history review
6. Laboratory data retention
7. Client Communication and forms generation
8. Capture and retention of photographs and scanned images
9. Intra-office and client-staff communications
10. Tracking hospitalized patients
11. Generation of client reminders
12. Control drug tracking
13. Inventory control and tracking
14. Accounts Receivable reports and statements

If you're already using AVImark, you may be using any number of these functions already. In general, the places where we end up having the most resistance from staff involves the use of the boarding and appointment calendars if they are used to a written scheduler. On the other hand, resistance from the medical staff usually involves electronic medical records. Let's take a look at each of these goals and see how they can be implemented with AVImark and other utility software.

Appointment Calendar

The Appointment Calendar in AVImark is quite easy to use and allows for scheduling multiple doctors in multiple facilities. The key to using this is to develop practice strategies for the staff before they are asked to go live with it. You'll find that this approach will allow the transition to paperless methods to become less painful. A simple way to approach the subject, is to take your appointment calendar book and use it as the source of your training exercises. Have each staff member who will be responsible for appointments make a minimum of 50 appointments based on appointments that you have in your written book. Frequently it pays to have employees role-play as if one person is on the telephone calling in to make the appointment so that they can do it effortlessly through the phone. During the transition, it may be helpful to have the reception staff make an appointment in both the written book and computer for a week or so until they're comfortable with the computerized scheduler. Then have a meeting and inform the staff that the written schedule will be removed on a certain day. In some hospitals it can be helpful to print out the AVImark schedule the evening before so the staff can have an idea of what's coming in the next day. Other hospitals choose to use the computerized scheduler and view it on screen. The beauty of this computerized appointment system, is that appointments can be made anywhere in the hospital virtually by any employee including doctors. This division of labor can lead to more efficiency and better client service.

Boarding Calendar

The Boarding Calendar is very similar in its implementation as is the Appointment Calendar. In our hospital, we utilize the boarding calendar to track our boarders and to help us track our hospitalized patients. When you check in patients using the Boarding Calendar, you have the capacity to set their status as boarding or hospitalized. By utilizing the "View | Columns" on the Whiteboard, you can add the "status" column and the "complaint" column to let you know who is in the hospital, what their status is, and why they are here. Moreover, you can customize which other columns are visible so that you can see the breed, age sex, and name of the pet and/or owner. In addition, you can set admission times and discharge times, as well. This functionality is part of the whiteboard/inpatient management system. Note that when you are displaying the Boarding Calendar, you can click on the top of any column and sort by that group. This is a simple way to differentiate hospitalized vs. boarding patients. Similarly you could sort patients by doctor or service.

Whiteboard

Keeping track of your in-patient population and their treatments is something that can be readily achieved using AVImark. The Whiteboard is a natural place to apply this. You can use the AVImark glossary to input templates for routine orders. More specifically, the way this works is that the doctors view the census list sorted by facility. They then press F5 on each of the patients that are in need of treatments (parked in InPatients) and enter their orders in the notes fields. Once or twice a day, the technical staff will print out the census list and use it as they go through the wards administering treatments. They can make notes on the list including things such as TPRs, appetite, general status, etc. along with acknowledgment of administration of drugs. Then they can take the census list back to a computer terminal and enter the data into each patient. Once the hospital scheduler is tweaked it will probably be a preferable method for monitoring hospitalized patients.

Medical Record Entry

When thinking about medical record entry we have to determine first whether the doctors or the staff are going to input information. It is my belief that this should be done by doctors; however, some practices have doctors who are computer phobic and can't or won't type so you should have an option for staff input. Making a physical exam sheet that mimics the SOAP window can do this. The doctor can write his/her findings and a staff member can input them. Alternately, one can purchase a tablet PC that has handwriting software recognition built in. The doctor can write on the tablet and the computer will convert it to text with reasonable accuracy directly into AVImark. While this has a real "coolness" factor, it is very slow compared to other means of data entry and it would require a tablet pc for each doctor in a busy practice. The AVImark Soap window is the easiest way to enter medical history. I should point out that some purists have a problem using the "SOAP" format since they are used to creating a "SOAP" for each problem. In practice, this system works very well and can be modified to your individual needs. We use a treatment code that is called "exam" and it has an action code of Q (to make it history only) and W (to create an automatic medical history (SOAP) window). When the patient comes into the hospital, the receptionist or tech enters this code, which brings up a SOAP window. The vital signs are entered in the appropriate data fields and the client history is taken in the notes field of the subjective section. You can make a glossary template with the questions you want the staff to ask and have them enter that in each exam.

The doctor performs the exam and enters the physical findings in the Objective tab of the SOAP window. We find that using the body abnormalities check boxes in the SOAP window (Work with | System Tables | Abnormalities table) allows you to set up a series of "checkbox" entries for abnormalities. In this way, you can check only the body systems that are abnormal and enter the findings in the appropriate section. In order to speed data input, you can use the glossary function or use a text expansion utility program that will expand your common abbreviations. We use one called As-u-type (www.asutype.com) and others have used a program called Robotype (http://www.pcmag.com/article2/0,4149,427373,00.asp). In addition, the use of speech recognition software is quite functional providing you have a reasonably quiet environment in which to dictate. I have been using Dragon Naturally speaking preferred edition with good success. It only takes about 30 to 40 minutes of training together and 95 percent accuracy rating. In fact, this paper has been composed with the "Dragon".

Once the subjective and objective sections have been filled in, you can put your assessments on the Assessments tab. AVImark has an elaborate system for developing various rule outs associated with different problems. You can associate diagnostic and treatment plans with those problems and even canned estimates for working up those problems. While I helped design the system, in practice, I find it to be a bit cumbersome. However, some clinics are using it quite successfully. Exactly what you place into your assessments is a matter of personal preference. In our hospital we generally use this area to list the general problems and our basic rule outs. Keep in mind that the goal is not to create an academic treatise, but to give you and your associates an idea of what you are thinking about as you review the record later.

In the plan section of the SOAP, you have the opportunity to enter either diagnostic or treatment plans. Again, in our hands we usually put both diagnostic and treatment plans under one heading.

After entering the medical history, it is a good idea to select diagnostic codes to denote the diagnosis of the pet. You can put notes on these treatments to give the specifics about the diagnosis. The nice thing about diagnosis codes is that they print out on the top of the chart and can give you a quick overview of the patient's major problems. You can also sort the medical history to show only diagnoses by clicking on the Diagnosis tab at the bottom of the Medical History section of the CID. Alternately, you can use the problem list, which can be generated in the assessment pane of the SOAP window, or use both since problems are not always diagnoses.

Regardless of how much or little you decide to put in the medical record, odds are the fact that it is organized and readable will make it far superior to anything you may be putting out in your written records.

Reviewing the Medical Record

Now that the information is in the computer, it is important that you are able to access it easily. The first thing to get used to is printing the patient chart to the screen using the preview button (Ctrl-F6, click Preview, or right-click in the patient section of the CID and select Chart). This will display the entire history in various formats and you can scroll through it chronologically. You can also pre-sort the medical history using the tabs at the bottom of the Medical History section of the CID. Each tab will allow you to display history associated with that particular category. So, if you want to review all the drugs that have been dispensed, click on the RX tab. To review all the medical history entries, click on the SOAP window, etc.

Tracking Lab Data

Laboratory data is an important aspect of the electronic medical record. AVImark is very versatile in its ability to record laboratory data from multiple sources. Any treatment codes can be set up to record lab data using the More Stuff fields. Any data recorded in these fields can be assigned normal values based on various species, and can be graphed over time. For those clinics using certain lab machines, a direct interface can be established between the machine and a particular code in AVImark. If you're obtaining lab data from an Antech, or IDEXX, AVImark is able to directly Interface with their Zoasis and VetConnect websites respectively and allow you to download your lab data and import it into the medical record. This function continues to evolve and is getting better with each iteration. The ultimate goal, is to be able to have sequential tracking of all lab analytes over time. Much of that functionality is available currently, but it can still use some work to be fully functional.

In the meantime, if you're receiving your lab data by fax, you can scan this information into the computer either directly into the photo window associated with about treatment code. This is done through the use of Twain drivers. These drivers allow the acquisition of photos or scanned images from input devices directly into various programs. The disadvantage of scanned images is that they are not readily editable and they have to be viewed in the photo editor. Another approach, is to use a Word document, and acquire the image directly into the Word document by clicking on Insert | Picture, then acquire the image from the scanner. The advantage of using this technique is that you can put multiple pages in the same document, thereby, eliminating the need for multiple photo entries.

Remember that you can isolate all lab related treatment codes by clicking on the "lab" tab on the bottom of the medical history window of the CID. Then you can print a chart using the preview mode that gives you all the laboratory data sequentially.

Client Communications

AVImark uses Microsoft Word® for word processing. It can also use Open Office; however, there are certain problems with merge words in forms in Open Office which can be problematic. You can create all sorts of client information handouts in Word and have them available to be printed out for your clients by attaching them to a treatment code. In the treatment code maintenance screen, create a category called "information and forms". All the codes in this category will be used to bring up handouts for the clients. The action codes for these treatment codes should be Q to make it a history only entry, @ to bring up the document automatically. The documents are stored on the server in the directory of your choosing. Typically, this is the "My Documents" directory within the AVImark folder on the server. However, you can specify this directory in the Hospital Setup | Documents tab. Remember that you can use any of over 150 merge words in your documents. This gives an incredible amount of versatility in the types of handouts you can create.

It behooves one to learn how to use the forms function in Microsoft Word to take advantage of the full power of Word and AVImark. Forms are very simple to make once you understand some basics. Depending upon your version of Word, you want to work with the Forms toolbar. In the newer versions, it can be found on the Developers tab of the Ribbon. This toolbar allows you to insert form fields into your documents. These include checkboxes, text entry boxes, lists boxes etc.. The difference between a form and a document, is that a form allows you to enter data into the form fields, but not to change the entire document. You can even define what the default entries in each field shall be so that there is less actual manipulation of the form necessary. You can also use merge words in forms but realize that the words will not emerge until you print the form from AVImark (right-click on the treatment line associated with the form, select Form | Print).

It is important to understand that when you are editing a form in Word initially, you can place form fields anywhere you like and change the text of the document in any fashion. Once you have the form looking the way you want it, then you must lock the form by protecting the form. This will prevent the form from being changed by other users in AVImark. They will, however, be able to make entries into the form fields but not change the text of the form.

Original forms must be stored in the same directory as your documents (typically "My Documents" within the AVImark folder on the server). Once a form has been filled in, it is stored in a different directory than the documents. Typically this directory is called "My Forms". Once you get the hang of using forms, you'll find hundreds of uses for them; for example, discharge forms, admissions forms, surgical reports, anesthesia records, chemotherapy records and on and on. There are a number of useful forms posted on the AVImark boards at Yahoo groups.

Please remember that when you print a form, it must be done through AVImark (right-click on the treatment associated with the form, select Form | Print) in order to have the merge words merged into the document.

When you have created your forms and information documents you will now be able to document all of your client communications efforts by simply entering the appropriate treatment code. Moreover, you can reprint all of the forms that you create so that if there is ever a question as to what you told the owner, you can clarify by reprinting it. Forms are not visualized when you view the chart in AVImark. They can, however, be printed if the chart is printed out.

Image Capture in AVImark

Images can be captured in AVImark through the use of the photo editor. These images can be imported as either JPEG or Tiff files or DICOM. JPEG images are typically used for photos while tiff images are typically the result of scanned images and DICOM is used for digital x-rays. JPEG images are compressed and take up much less disk space than do tiff files. With today's hard drives being so inexpensive, it is not a great concern how large file sizes

are with one caveat; that being, the ability to backup all of your photos and images. Generally, when it comes to photos, there are two basic uses for photos. The first is the capture client and/or animal pictures and the second is the capture of lesions. Getting photos into AVImark can be done in a number of ways. The simplest approach, is to use inexpensive Webcams that have Twain drivers that can be accessed through the AVImark photo editor. In this scenario, the Webcams are left hooked up to the computer and the exam rooms. When the photo is needed of the pet and/or the client, right-click in the patient's section of the CID and select Photos | My photo. This opens the photo editor. Click on the camera icon, and AVImark will be the choice of any image capture device that's connected to your system. The operator selects the appropriate device, takes the picture and is instantly transferred into the window. You then save the image.

While web cams work well, the quality of the image can be lacking. We have moved to using digital cameras with wireless interfaces to capture images. Currently we use Nikon coolpix p2 cameras, but you can look for any digital camera with a wireless connection, or you can purchase wireless sd cards and put them in the camera of your choosing. The wireless access makes it much easier to download the images as soon as you take them, which greatly enhances the chances that the staff will actually import them. They will typically be downloaded to a folder on the server and then you can drag the photo into the AVImark photo editor, or open it directly using the photo editor file menu.

In order to utilize photographs that are not simply pictures of the pet in AVImark, one must develop treatment codes on which to attach them. We have a generic "photo" code that we use to attach photos to. Once the photos are attached, we alter the description of the treatment codes to reflect the contents of the photo. Capturing images with a digital camera gives you the advantage of high-resolution, better focus, and more control over exposure shutter speed etc. Very frequently there are requests from the users on the AVImark board about what type of camera to get. There are so many cameras available these days, that it really becomes a matter of personal preference. One should get a camera that is at least 5 mega pixel resolution. Look for a camera that has good macro capabilities. Nikon is particularly good in this area, but cameras from Olympus, Cannon, Fuji and Kodak are very good as well. Choose a camera that fits your budget and fits your personal needs. Some cameras have docking stations that facilitate instant download to the computer. However, I do not believe that these download directly to AVImark. In most instances, obtaining photos from a digital camera involves downloading the photos to your hard drive, or inserting the SmartMedia or CompactFlash cards into a reader and then obtaining the images directly from them. This is a relatively simple process once you've done at once or twice. The photos are viewed in various programs (such as Adobe Photoshop, Elements, Picassa etc.), and the images are copied to the clipboard and subsequently pasted into the photo editor of AVImark. When we tried to use this approach for obtaining photos of all of our pets, we found that we didn't get nearly as much compliance from the staff in entering the photos as we do with the wireless cameras or webcams. Moreover, these cameras are typically much more expensive, and we have had two cameras broken by the staff. Therefore, we use a digital camera strictly to obtain high-resolution images of lesions. If you're taking multiple images on the camera, create a log to indicate what the contents of each photo are. In this fashion, you can take multiple images throughout the day, log them into a written log, and then a staff member can download them as a group. One more word about resolution. You can set your camera to 480 x 640 for the images of pet photos or non-critical images to save space on your hard drive. Since these images are mostly to be viewed on screen, the resolution is adequate. Once you start having thousands of photos on your hard drive, it will make a difference in the time it takes to back up your photos.

The use of photos that has been very effective as a client education tool. Create a client in AVImark called "photos". Then create a new pet for each type of procedure you want to be able to display photos of. For instance, we have an "animal" called lateral ear resection of which has multiple images of the before during and after surgical procedure. These images can then be displayed in the exam room for the client to help explain any procedure.

In order to be paperless, we need a way to store physical forms. Scanning is the answer to this problem and in order to make it painless, you should invest in a heavy duty, sheet fed scanner. We've been successful using Fujitsu ScanSnap, which is a compact sheet fed scanner. The advantage to it is a small footprint, and speedy scanning times (less than 5 seconds per page) and it scans into Adobe .PDF format. Other people have been successful with

flatbed scanners but they are very slow and time consuming. If considering flatbed scanner it would be wise to have a sheet feed option attached to it. Most commonly the scanner is used for scanning in historical information such as medical records. We also use the scanner to capture copies of signing documents such as estimates and authorizations for surgery and treatment. Saving these forms in the computer saves a lot of space and time in filing leaves them always available to you.

Once the information is scanned, you can attach it to the medical record using the "attachments" function in AVImark. It helps to create a code(s) that tells you what information is attached. For example, you can create a treatment code called "scanned medical". Click on the attachment box to the right of the screen, navigate to the folder where you scanned your image and select the file you wish to attach. Once you connect the attachment, it will be stored by client and patient in AVImark.

Entering Images From Analog Video Sources

Sometimes you may want to enter still images from non-digital or analog video sources. There is a product called "Dazzler" which is available at most computer stores, that will take analog signals and convert them into digital images which can then be captured in AVImark. We're successful using this product to capture images from our video otoscope. I assume that most analog video devices can be downloaded in this fashion.

Radiographic Images In AVImark

Placing radiographic images into AVImark can be done by photographing the images using a tripod and high-quality camera. The image does not have quite the resolution that the original film does nor does it compare with high-resolution scanning, however, it will give you a generalized idea of what is going on in the radiograph. For those of you who use the VIN system on the Internet are probably used to seeing radiographic images obtained in this manner. When taking these photos, it is best to set your camera's resolution to its highest setting. While this will result in higher file sizes you'll also get more information in the radiograph.

Alternately, one can purchase high-resolution scanners made for this purpose. Unfortunately the scanners are fairly expensive and generate huge files.

Since more and more practices are using digital radiography (ours included), you can attach DICOM or JPEG images of the radiographs directly to a line item in the medical record. There are pros and cons to this. The pro is that you have access to the images directly from the AVImark program. The con is that the DICOM images are very large and accessing them over the network is often times time consuming. Moreover, if you store them in AVImark, they will be included in the AVImark backup and can substantially increase back up time.

All digital systems come with some PACS system to store and access radiographs. They also come with viewing software which, in my opinion should be available on all of your workstations at no extra charge (we use Sedecal/Vetray and their viewer is free for all workstations). You can readily access your radiographs using this technology and usually end up with a better viewer with more ability to manipulate the images. You could store jpg images in AVImark and leave the DICOM images in the PACS system but it seems redundant.

While on the subject of digital radiographs, be sure to have raid arrays on your digital xray acquisition server, along with external hard drive backups and backup to the cloud with Data Vault, carbonite, Crashplan or other software.

Intra-office Communications

Throughout the day, communications are ongoing between staff members and clients and among staff members themselves. We can use the AVImark program along with other utility programs to facilitate this communication and keep a written record of such communications.

There are many ways in which one wants to communicate within the hospital. Doctors need to give instructions to staff members, staff members need to communicate with doctors and all staff members need to communicate with clients. In order to facilitate this we create treatment codes for each staff member, which they can use to record their communications. These treatment codes must have an action code of "Q" so that they are recorded only in the medical history, and a code of "*" to automatically open a note window. For a receptionist, we create code called "reception notes-??" Where?? is the name of the receptionist. The code for this note can be simply "RN??" Where?? Represents the initials of receptionist. Whenever the receptionist has a discussion with a client or other staff member that is pertinent to the medical record, he or she enters the information using this code. As it is entered, AVImark will give a time and date stamp, which helps maintain an accurate time line of discussion.

In a similar manner, each doctor is given a code with the same action codes. In our hospital, we designate this as a "Dr. progress notes:??" where ?? reflects the initials of the doctor. Whenever the doctors discuss information with clients or staff pertinent to the particular animals medical history, these codes are used and the information entered.

Handling Telephone Notes

Most hospitals are inundated with telephone calls all of which must be routed to the various staff members in the hospital. Frequently these telephone calls cannot be answered right away and notes are taken to convey the messages. In order to eliminate the written phone notes and ubiquitous sticky notes around the hospital, we use a utility program called "net notes" (www.alshare.com). This utility program creates electronic post-it notes, which can be sent to any single computer or group of computers in the hospital. These notes can be color-coded for different users and they can even have alarms set to alert the user and a particular time and day. One of the nice aspects of this program is that if notes are deleted, they're not lost. Instead they can be retrieved indefinitely from a log in the computer.

When a receptionist takes a phone call, he or she will enter the information in AVImark using their reception note code. Then they will copy that information to the clipboard using Ctrl-C keys. Then they create a new net notes into which they paste (CTRL V) that information. Net notes allows the creation of various data fields in each note which the operator can fill in to designate the client's computer number, pet's name etc. The net note is then sent to the appropriate workstations where the doctors are likely to find them. When the doctor responds to the call, he or she will enter their discussion using the Dr. progress notes. He or she may then make a response to the originator of the note using net notes to let them know that the issue has been dealt with. The notes are also very functional for creating to-do lists, low stock alerts, meeting alerts etc.

Controlling at Checkout

In most hospitals, animals are being treated in an area far from the reception area. Frequently the receptionist are not knowledgeable as whether the procedure has been completed or if and when an animal can be discharged. To help improve this level of communication, we created a code called "RTG" or ready to go home. This code has additional data fields created using More Stuff that include the following:

- ✓ Time to discharge
- ✓ Date of discharge
- ✓ Speak with Dr.?
- ✓ Speak with tech?

- ✓ Bandage change in?
- ✓ Suture removal in?
- ✓ Medication to go home?
- ✓ X-rays to be viewed
- ✓ Recheck appointment
- ✓ Discharge instructions
- ✓ Comments

Each of these fields is designated as phrase fields (when creating them in more stuff) with the exception of comments with any designated as of WP field. The action code on this code should be "Q." to keep this medical history only, and "B" to automatically open the More Stuff window when the code is posted.

In our hospital, the receptionist is not allowed to discharge an animal unless this code is present. If it is not, they must track down the admitting doctor and get permission from them.

Other useful codes can be created to track who admitted and who discharged an animal. Each of our reception staff is given a code "admitted by??" and discharged by?. Using these codes makes it simple to track down the appropriate person with their questions regarding an admission or discharge.

AVImark has a feature, which allows you to control checkout. When this is turned on, the reception staff could not release a patient until someone with high enough security had checked the chart and "released it". I love the concept of this feature, but when we tried to implement it, it became difficult.

Using Alert Boxes

One shouldn't forget that AVImark has a built-in alert system that can be used to help notify staff members about specific issues pertaining to an individual pet or client. Right-clicking in the patient or client section accesses these alerts.

Intra-office EMail

We use a program called Powerclock (Powerclock.com) for our time clock needs. While AVImark has integrated a time clock system, this program is more robust and meets our needs better. In addition, Powerclock has an integrated email system which allows you to send emails to individuals or groups of employees. Whenever an employee clocks in, the program alerts them to any awaiting email messages. As the administrator, you can tell if an email has been read or not. Because each person has to use the time clock at least twice daily to clock in and out, this is a terrific way to ensure distribution of important information to the staff.

Maintaining a Phone List

There are many, many phone numbers that staff members need access to on a regular basis. Using the Q & A function (Work with | Q & A), create a new "category" called "phone list". Make entries into this list whenever you are using a phone number that you may need again. Using the Notes function, you can enter unlimited information about that phone number. AVImark will then sort the list alphabetically and it will be available at any workstation at anytime.

Centralizing Clinic Protocols

Using the integrated Q&A function, you can make an online manual of all of your hospital procedures and techniques. As time goes by, you'll find yourself making quite an encyclopedia of information into the Q & A database.

Keeping Track Of Patients

The AVImark work lists feature is very helpful for keeping track of various patients for various purposes.

You can define as many work lists as you feel necessary for your hospital. You can then designate treatment codes that automatically place the patient on a particular list when the treatment code is entered into the medical history. Because you will no longer be working with physical charts, this feature can be very helpful in making certain that you complete all of your medical entries. In our hospital, we have a list for charts to write up for each doctor. When the doctor sees a patient, that patient is placed on that list automatically through the use of the treatment code. Then throughout the day, the doctors can review those lists and make any additions to them as necessary. In the same manner, we use lists for laboratory pending which is generated automatically every time a laboratory code is entered. For laboratory items that may take longer than one day to come back, we have an additional work lists called lab miscellaneous. We use this for items such as histopathology, cultures, various serology tests etc.. When laboratory data is returned from the lab and the technicians put it into the patient's record, they then transfer that patient from the lab pending list to the lab final list. In this fashion, doctors can check the lab final lists and telephone owners with results without having to go through the patients whose results are not yet in.

We also use a work list associated with all euthanasia codes to make certain that sympathy cards and/or flowers are sent to the owner. Once you start to use work lists, you may find other uses for them.

Generating Client Reminders

Most of you are probably using AVImark to generate your client reminders. In terms of trying to apply this in a paperless environment, you should consider the use of VetPressOnline for reminders or the Healthy Pet reminding system. For more information about VetPressOnline, call (866) 212-2502. This system eliminates much of the time spent creating, sorting, and mailing written reminders. For information about Healthy Pet, call (800) 426-9119. In addition, for those clinics having broadband access to the Internet, you can send reminders via email to your clients along with any other correspondence. Contact a representative of Henry Schein Veterinary Solutions about how Rapport can help with client communications via text messages, email, and online scheduling. For information about Rapport, call (855) 980-9099.

Tracking Control Drugs

AVImark will maintain your control drug log if you allow it to. The instructions to do so are in the Help file and is self-explanatory. We find it helpful to print labels for all controlled drugs as they are prescribed and dispensed. A staff member must have the label in order to get the drug from the lock box. You can make a physical log form and paste these labels to it as the drugs are used.

Inventory Control

There are a number of aspects to inventory control. The first is the appropriate pricing of your drugs and products. AVImark will do this without a problem, providing you enter the appropriate information in the inventory detail, such as the cost of the drug and the appropriate markup parameters. In order to have AVImark keep track of your ongoing costs of drugs, who you purchased them from etc, you must be willing to create purchase orders for everything you buy. Then you have to check in everything that comes in the hospital. There are some rough spots in the inventory module; such as, what to do when you order a drug in different "order packs". For example, purchasing a drug in a 250 pill bottle one week, and a 500 tab bottle next time. We have not fully integrated the purchase order system into our hospital; therefore, I will point you to the user group for more details.

Statements and Receivable Reports

The AVImark statement and receivable reports are very simple to use if you follow the help text. You can use the work list to flag owners that you want to call about overdue balances.

Converting From Paper To Paperless

The process of converting from paper to paperless just needs a bit of a plan. Give yourself 4 to 6 weeks to train the staff and be methodical about it. Set aside scheduled time for your staff to learn the system, including doctors. That is to say that everyone should be scheduled an hour or so a day to learn what they need to know about the system. This project should be headed up by the owner or the manager of the clinic, not assigned to just any staff person. It is important that whoever is in charge needs to be very familiar with the program and has to be able to answer questions of the staff with ease. If you are struggling with the program, they will have a tough time getting into it.

As a clinic, you must decide who will be responsible for entering medical records. I believe that you should simply insist that each doctor do their own records. For staff or doctors who can't type, consider purchasing Mavis Beacon Teaches Typing to help them learn the basics. Also, installing the text expansion programs (Asutype or Robotype) from the beginning will reduce the typing load significantly.

Different staff members need to emphasize different aspects of the program during their initial training.

Position	Primary Training	Secondary training
Reception	Client/Patient entry Medical History entry Appointments Boarding Invoicing Phone notes Estimates	Medical record review Scanning medical history
Technicians	Basic CID functions Creating Estimates, Entering Vaccine info, Entering Subjective Findings, Entering Progress notes, Census list protocol Entering Lab Data	Work list usage Posting Estimates Working with client communication forms
Doctors	Basic CID functions Viewing medical history using chart view, medical history tabs etc. Entering SOAPS Generating Estimates Census List Protocol Entering Doctor Progress notes Posting Estimates	

To ease the transition, you can stage your move to a paperless environment. Many clinics begin by starting to use the Boarding and Appointment calendars by the reception staff. In the meantime, the doctors and technical staff can begin entering medical history using the SOAP format. Everyone asks what to do with existing medical history. It makes most sense to just enter synopsis of the previous medical history as clients present to the clinic. This will save a huge amount of time entering data for pets who may not show up again. Some clinics scan in the entire old record, others keep the physical files and refer to them. It is probably most effective to scan the information in so that you can get away from the crutch of the physical records. Each practice will have to make a decision about this.

After you have gone a few weeks with the appointments, boarding and medical records going in, you might add the net notes feature, and begin working on inventory management.

Hopefully this paper has helped you understand the benefits of "paperless" practice and will give you the impetus to implement it in your practice.

One final word of caution. At some point there will probably be a time when your server goes down, the power is out, the data is corrupt, etc. For these times, it is important to maintain an emergency paper protocol to keep the hospital running. This should include:

- ✓ Printed out copies of all inventory and service code pricing
- ✓ Forms for creating estimates
- ✓ Forms for creating receipts
- ✓ Admission and discharge forms
- ✓ Cash control logs
- ✓ Patient census logs
- ✓ Surgical and Anesthesia flow sheets.
- ✓ Lab Data Request forms etc.

Keep these forms in a handy place and once a month have a "computer crash drill". It would be helpful to run a drill and write instructions on how to transition from the main server to the backup server, should the main server crash.

Best of Luck