IT for IVF

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It’s all about language…

What’s the difference between an etymologist and an entomologist?

An etymologist knows the difference!

etymology - the study of the origin of words

entomology - the study of insects
Learning Objectives

• At the conclusion of this CME program participants should be able to:

  – Examine the role of the tablets/portable technologies in enhancing provider workflow

  – Utilize specific apps to improve efficiency

  – Understand the advantages/disadvantages of wearable technologies
Conflict of Interest Disclosure Statement

I do not have financial interest or other relationships with the industry relative to the topics being discussed.
WARNING: Audience Participation
What is in your pocket?

1) iPhone
2) Android
3) Blackberry
4) Windows Phone
5) Other
How long have you had your device?

• 1) less than one month
• 2) less than 6 months
• 3) less than 1 year
• 4) 1 to 2 years
• 5) more than 2 years
How often do you use your device at work?

• 1) multiple times a day

• 2) once a day

• 3) a few days a week

• 4) once a week

• 5) rarely
Do you own a tablet?

• 1) Yes

• 2) No
How long have you had your tablet?

- 1) less than one month
- 2) less than 6 months
- 3) less than 1 year
- 4) 1 to 2 years
- 5) more than 2 years
How often do you use your tablet at work?

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Computing Culture

- For the first time since the 2001 dot-com bust, shipments of personal computers (PCs) fell in 2012.

- In the early 2000s PC sales declined because of the stock market.

- In 2013, despite a robust economy, PC sales continued to plummet. Why?!?

**TABLETS**

- According to analysts at J.P. Morgan, tablet sales rose 72% in 2012 and surged an additional 54% in 2013.

But in 2014, PC sales improved…

- Businesses and consumers alike are again purchasing PCs, and Mac sales are on the rise year-over-year.

![Has the PC Industry Bottomed Out?](chart)

@StatistaCharts  Source: Gartner


Tablets ARE PCs

The most productive tablets on the planet.
When do people use their devices?

What can you do with a tablet?

• E-Read (Continuing Medical Education)

• Download apps!

• Reference tools

• Electronic Health Records

• Email / Messaging
# Tablets come in many shapes / sizes / OSes

## Lenovo Tablets

**LENOVO TABLETS**

**Work. Play. Comfort. Versatility.**

![Yoga Tablet](image)

**YOGA TABLET**

3 Modes & 18 hours of battery.

**Explore Yoga >**

**See the unveiling >**

Battery life may vary. For further details, go to Lenovo.com.

<table>
<thead>
<tr>
<th>ANDROID TABLET PCS</th>
<th>WINDOWS TABLETS PCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backed by the Google App Store, Android offers all of your favorite apps, games and productivity tools. With near-limitless customization and easy access to all of Google's services, it's no wonder Android is considered the world's most popular mobile OS.</td>
<td>Windows 8 makes it's easy to do more than one thing at once – like running multiple apps side-by-side. It works the way you do: customize your experience by placing your favorite apps, sites, and people on the Start screen, all while getting live updates at a glance.</td>
</tr>
</tbody>
</table>

*Explore Android >*

*Explore Windows >*

Big mistake at a delicate time...

Windows 8

MICROSOFT SURFACE WITH WINDOWS RT

Microsoft's Surface offers a sleek magnesium chassis, sharp screen and magnetic Touch Cover that doubles as a keyboard, proving to be one of the most innovative iPad alternatives yet.

At 10.6 x 6.8 x 0.4 inches and 1.5 pounds, the Surface is heavier and thicker than the ASUS Vivo Tab RT (1.1 pounds, 10.4 x 6.7 x 0.3 inches). A panel on the back flips up to become a sturdy kickstand. The Touch Cover snapped on quickly and accurately, and the bond between the dock and the covers is very strong.

When we watched a 1080p offline trailer for “Skyfall” on the 10.6-inch 1366 x 768-pixel display, images were bright and colorful. Viewing angles on both tablets were strong from 90 degrees to any side.

When we played the standing 5 feet away from us couldn’t make out the lyrics.

We found the $119 Touch Cover an accurate way to type on the Surface, but not as pleasant as typing on a traditional keyboard. The slightly thicker $129 Type Cover’s keys offer solid tactile feedback that made our typing a lot faster.

The Surface notched a solid 347 on the Peacekeeper browser benchmark, better than the Vivo Tab RT’s 338. The Surface’s internal memory took a sluggish 6 minutes and 3 seconds to com-

of the worst-quality images and video we’ve seen on a premium mobile device. Images were horribly blurry and noisy, and many of the colors were washed-out.

The Surface still had more than 30 percent of its charge left after 7 hours of sitting with its screen and Wi-Fi on.

Microsoft Surface with Windows RT Review http://www.laptopmag.com/reviews/tablets/microsoft-surface-rt

Most popular vendors...

The Tablet Market Is Increasingly Fragmented
Global market share of leading tablet vendors (% of shipments)

- **Q2 2012**: Apple 26.9%, Samsung 17.2%, Lenovo 4.9%, Acer 4.6%, Others 2.0%
- **Q2 2013**: Apple 26.9%, Samsung 17.2%, Lenovo 4.9%, Acer 4.6%, Others 2.0%
- **Q2 2014**: Apple 44.4%, Samsung, Lenovo, Acer, Others

Source: IDC

Do I need a new tablet?

• Tablets have hardly improved beyond relatively superficial changes in size, screen resolution, and processor speed.

• People that want tablets have them, and there’s just no need to upgrade because they more than adequately perform their assigned tasks.

• The market for tablets is saturated: grandparents and kids have them!

iPad Air 2  iPad Air  iPad mini 3  iPad mini 2  iPad mini
Tablet Adoption...

The Tablet Hype Has Officially Died Down
Worldwide tablet shipments (in million units)

Q4 2013 | Q4 2014
---|---
-18% | -19%
+9% | -25%
-71% | +36%

Total Shipments
Q4 2013: 78.6m, Q4 2014: 76.1m, -3%

Source: IDC

Why do people use their devices? (2012)

Smartphones Serve As Pocket PCs and Extend Desktop Experience

- 51% Browsed the internet
- 42% Used a search engine
- 38% Used an App
- 18% Watch videos

Smartphone Activities Within Past Week (Excluding Calls)

Base: Private Smartphone users who use the internet in general, n= 5000
Q23: Which of the following activities do you do with your Smartphone?
Please indicate whether you ever do this at all and if yes, if you did this within the last 7 days.

How do people use their devices? (2015)

- **Text Messaging**: 92%
- **Taking Photos**: 92%
- **Internet Browsing**: 84%
- **Emailing**: 76%
- **App Downloads**: 69%
- **Gaming**: 64%
- **Social Networking**: 59%
- **Navigation**: 55%
- **Watching Video**: 54%
- **Tweeting**: 15%

Smartphones are a common starting place

Smartphones are the most common starting place for online activities

- Started on smartphone: 65% Searching for Info, 63% Browsing the Internet, 65% Shopping Online, 47% Planning a Trip, 59% Managing Finances, 66% Social Networking, 56% Watching an Online Video
- Continued on a PC: 60% Searching for Info, 58% Browsing the Internet, 61% Shopping Online, 45% Planning a Trip, 56% Managing Finances, 58% Social Networking, 48% Watching an Online Video
- Continued on a tablet: 4% Searching for Info, 5% Browsing the Internet, 4% Shopping Online, 3% Planning a Trip, 3% Managing Finances, 8% Social Networking, 8% Watching an Online Video

The Mega Guide to Maximizing eCommerce Sales, Revenues and Performance on all Fronts
October 10, 2013 Accessed March 12, 2014
Do I really need a tablet or a bigger phone?

iPhone 6
Bigger than bigger

The Next Big Thing Is Here™

The Samsung Galaxy S® 5 isn’t just groundbreaking innovation, it’s technology that adapts to your life.

To order yours, select your carrier and color below.
The Flagship Showdown

What do you **need**? / What do you **want**?

• Is this device for work or personal use?
  – If for work, do you plan on using it outside of work?
  – If for personal use, do you plan on bringing it to work?

• Are you looking to replace your PC?

• How do you use email? How do you want to email?

• Do you read electronic publications?

• Will you be the only user of your tablet?
Best question from ACOG ACM 2014….

• Price does **not** equal quality!

• Expensive tablets can be expensive paperweights

• Not all “cheap” tablets are cheap on features.

• Monthly service charges are part of the cost of the device
Brian’s Solution: Microsoft Surface Pro 3

- Mobility
- Sanitizable
- Security
WARNING: Audience Participation
Do you use cloud-based software?

• 1) Yes

• 2) No
Do you use Netflix or Hulu?

- 1) Yes
- 2) No
Do you use Gmail or Yahoo?

• 1) Yes

• 2) No
Do you use iTunes?

• 1) Yes

• 2) No
Backup / Allocation of Resources

It’s looking a little cloudy out there….

<table>
<thead>
<tr>
<th></th>
<th>OneDrive</th>
<th>Dropbox</th>
<th>Google Drive</th>
<th>Box</th>
<th>Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>File size restrictions?</td>
<td>2GB</td>
<td>None with Dropbox apps</td>
<td>10GB</td>
<td>250MB for free plan, 5GB for paid plan</td>
<td>None</td>
</tr>
<tr>
<td>Free storage?</td>
<td>15GB</td>
<td>2GB</td>
<td>15GB</td>
<td>10GB</td>
<td>15GB</td>
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<tr>
<td>Can I earn extra free storage?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Paid plans</td>
<td>$2/month for 100GB, $4/month for 200GB</td>
<td>$10/month for 1TB</td>
<td>$2/month 100GB, $10/month for 1TB</td>
<td>$10/month for 100GB</td>
<td>$10/month for 250GB</td>
</tr>
<tr>
<td>OSes supported</td>
<td>Windows, Mac, Android, and iOS</td>
<td>Windows, Mac, Linux, Android, iOS, Blackberry, Kindle Fire</td>
<td>Windows, Mac, Android, and iOS</td>
<td>Windows, Mac, Android, Blackberry, and iOS</td>
<td>Windows, Mac, Linux, Android, and iOS</td>
</tr>
</tbody>
</table>
Is the cloud a safe space?

Do healthcare data belong in the cloud?

In June, the Wall Street Journal reported that the Obama administration had hired Amazon.com to host certain HealthCare.gov components. That may seem to be a curious partnership, but remember that the world’s largest online retailer never closes. Amazon.com is always just a click away and sells not only books and other tangible products, but also streaming media such as TV and Yahoo! are 2 examples of web-based email systems in which data “live” on a server and can be accessed remotely. Other cloud-powered services you may be using include Box.net, Dropbox, GoogleDocs, GoogleDrive, and iCloud. Each has different applications and modes of interaction, but the principle is the same—data are stored remotely and can be accessed whenever and wherever.

How do you know it was really deleted? What if the service provider backed up the information on 3 different servers to ensure that there would be no service interruptions? What seems to be a secure back-up feature may, in fact, be a dangerous form of data duplication.

Healthcare data and the law

Things are murky when it comes to...
[text] messages may reside on a mobile device **indefinitely**... messages **often can be** accessed without any level of authentication, meaning that anyone who has access to the mobile phone may have **access to all text messages on the device without the need** to enter a password.
Be Cloud Conscious!
Explore the Chrome Browser

Chrome is a fast, simple, and secure web browser, built for the modern web.

[Download Chrome]

- **Speed**
  Chrome is designed to be fast in every possible way. It’s quick to start up from your desktop, loads web pages in a snap, and runs complex web applications lightning fast.
  [More]

- **Simplicity**
  Chrome’s browser window is streamlined, clean, and simple. For example, you can search and navigate from the same box and arrange tabs however you wish -- quickly and easily.
  [More]

- **Security**
  Chrome is designed to keep you safer and more secure on the web with built-in malware and phishing protection, auto-updates to make sure you have all the latest security fixes, and more.
  [More]

- **Privacy**
  Chrome puts you in control of your private information while helping protect the information you share when you’re online.
  [More]

- **Customization**
  There are tons of ways to customize Chrome and make it yours. It’s easy to tweak your settings and add apps, extensions, and themes from the Chrome Web Store.
  [More]

- **Signing In**
  Signing in to Chrome brings your bookmarks, history, and other settings to all your computers. It also automatically signs you into all your favorite Google services.
  [More]
Moving your fertility practice to the 21st century
Dragon Demo
Problem: What’s a good “fertility tracker”?

- Fertility trackers allow patients to enter simple information such as last menstrual period and length of cycle.

- The apps then generate a personalized calendar that shows the user her next fertile window and a 5-day view that shows the chance of conceiving on any given day.

- Many of the apps allow this information to "shared" so that the couple can be “synced” and alerted for when they should be “trying.”
Solution: Glow

Welcome to Glow!
Tell us a little bit about yourself so we can give you accurate predictions!

Are you trying for your 1st baby?
Choose from 1st to 10th

How long have you been trying naturally?

Did you want to update your period?

Morning temp °F

Did you have sex?

Performed CM check?

Precise info

Felt any discomfort?

Ovulation test

Your BMI
Problem: How do I prescribe exercise

• The 2009 Institute of Medicine recommendations for amount and rate of weight gain during pregnancy indicate that practitioners should discuss "diet and exercise" with their patients.

• For those of us who follow patients with gestational diabetes, demonstrating the effect of certain foods on blood sugar is a powerful educational tool for helping patients understand the importance of adhering to a diet.

• Yet when it comes to discussing exercise, it seems that many of us are at a loss for words.
  – What kind of exercise should I recommend?
  – How much exercise is enough?
  – How much is too much?
  – How do I know that my patient is actually exercising?
  – How do I prescribe exercise?
Solution: Objectively measure exercise

- The dilemma of how to quantify physical activity has been a hot topic of discussion for more than 50 years.

- In 1965 a Japanese doctor developed the first pedometer to give people the opportunity to meet measurable goals and thus increase their physical activity. The device was called the Manpo-kei (meaning "10,000-steps meter").

Solution: Runkeeper
Solution: Nike+
Solution: FitBit
**Solution:** Jawbone Up

- **UP move**: Move more. Get fit.
  - Get fit, lose weight, and have fun doing it. Choose your color, clip it on, and get moving.
  - $49.99

- **UP**: Eat, sleep and move. Better.
  - Make fitness a habit. Wear the motivation you need on your wrist to improve your days and nights.
  - $129.99

- **UP3**: The world’s most advanced tracker.
  - Heart health, advanced sleep and workout recognition. Welcome to the future of you. How far will you go?
  - $179.99
Solution: Apple HealthKit
Problem: What’s a good translation app?

• Without the luxury of a “live” medical translator, taking care of non-English speaking patients can be challenging.

• Although many translation apps are available (ie Google Translate), they are not designed for complex medical phrases.

• A timely and accurate history is the cornerstone of medical diagnosis and treatment; the relative difficulty of obtaining one with non-English speakers is a significant barrier to care.
Solution: Canopy Medical Translator

- Communicate instantly with patients in any language.

- Translated medical phrases covering history, physical exam, procedures, and reassessment in:
  - Spanish, Chinese, Arabic, Bengali, Filipino, Hindi, Korean, Malay, Portuguese, Russian, Vietnamese, and more.

- Call medical interpreters with one click right from the app.
Problem: What is a wearable technology?
Solution: This was Google Glass!

**Camera**
Glass has a 5MP camera capable of shooting video at 720p

**Projector**
The primary display of Glass is a rear projector that projects an image into a Glass Cube that is situated above the wearer's right eye.

**Touch Pad / Camera Button**
Although the primary control of Glass is intended to be voice, a touchpad exists to help navigate through cards and menus. This is a multitouch touchpad that allows for 2 points of touch.

**Main Housing**
Glass contains an impressive amount of hardware inside of its main housing. This includes a WiFi Radio (b/g) and Bluetooth Radio, 16GB of Storage (12 usable), 1 GB RAM, OMAP 4430 CPU (Dual Core ARM Cortex A9 clocked at 1GHz), gyroscope, allelerominitor and more.

**Plastic and Titanium Band**
Plastic and Titanium are used to form the frame of Glass. This allows it to be both lightweight and strong.

**Battery**
Glass has a 570 mAh battery that should get most users through a full day of use.

**Micro USB**
Used to charge Glass or to manage photos via a PC.

**Speaker**
Bone Conduction speaker in order to keep your ears free.
Google Glass Alternatives
Microsoft HoloLens
Problem: What can wearables do for Medicine?
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Wearables in the IVF Laboratory?

**Early blastocyst grading photos:**

<table>
<thead>
<tr>
<th>Early blastocyst</th>
<th>Early blastocyst</th>
<th>1AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavity very small = Can't yet grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner cell mass = Can't yet grade</td>
<td></td>
<td></td>
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<tr>
<td>Trophoderm = Can't yet grade</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td>Trophoderm = Can't yet grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cavity &lt; 1/2 embryo's volume = 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner cell mass = A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trophoderm = B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Intermediate blastocyst grading pictures:**

<table>
<thead>
<tr>
<th>2BB</th>
<th>2BC</th>
<th>3BB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavity &gt; 1/2 embryo's volume = 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner cell mass = B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trophoderm = B</td>
<td></td>
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</tr>
<tr>
<td>Cavity &gt; 1/2 embryo's volume = 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner cell mass = B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trophoderm = C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cavity completely fills embryo = 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner cell mass = B</td>
<td></td>
<td></td>
</tr>
<tr>
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Wearables in the IVF Laboratory?
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  – Understand the advantages/disadvantages of wearable technologies
How would you spend $1000?

- What features do you need?
- What features do you want?
- What features are you willing to forgo?
- How much are you willing to spend on your apps?
- How much are you willing to spend on monthly service charges?
- When will you buy your next device?
Shameless Plug....

A healthcare-fo tablet primer

Tablets are redefining personal computing and maki what we need from a device and its software.

For the first time since the 2005 desktop boom, shipments of personal computers (PCs) in 2012. Produced were reduced demand for PCs in the early 2000's, but in 2012. PCs saw a boom because of a need to access the tablet. According to analysts at IFR Mergers, tablet sales rose 75% in 2012 and may surge an additional 45% this year.

TABLET SOFTWARE

Tablets are now more than just mobile phones but also as powerful as laptop computers. There is a short list of currently available medical applications, their features, and the devices that support them. This list is in no way comprehensive. We also review the availability of these applications on iOS and Android.

Reference tools

E-Line: A free, time-tested, drug reference application for iPad, iPhone, and Android devices. It is available in the Apple App Store and Google Play.

UpToDate: A paid subscription service that provides evidence-based, up-to-date, and high-quality clinical resources designed to help clinicians make quality-of-care decisions. Its list of topics is impressive (e.g., 9,000 topics), and information is available in almost every clinical specialty. It is available in iOS, Android, and Windows and can be used from the free demo tool.

Apps and monitors for patient health

Apps for fitness, diet, and sleep help patients quantify their activity and reach their goals.

The 2009 Institute of Medicine recommendations for amount and rate of weight gain during pregnancy include “diet and exercise” with their patients. A survey of nurses found that 80% of nurses do not have formal nutrition training. Despite the need for nurses to discuss dietary intake with patients, it is often difficult to quantify a healthy diet (i.e., calorie intake, sugars, and saturated fats). The Institute for Clinical and Economic Review (ICER) is working to provide guidance on the use and impact of smartphone applications.

Shameless Plug...

Shameless Plug....
We are still evolving…

http://www.33rdsquare.com/2013/04/computer-scientists-find-that-evolution.html
Thank You!