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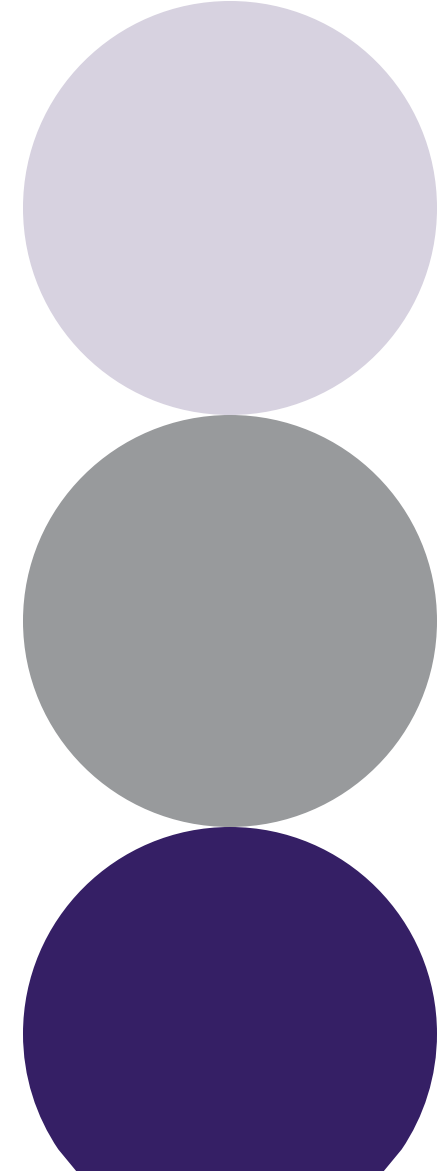
Healthcare Cyber Attacks and its Impact on Ophthalmology

Ravi D Goel, MD
Senior Secretary for Ophthalmic Practice

OBC 2024



Regional Eye Associates



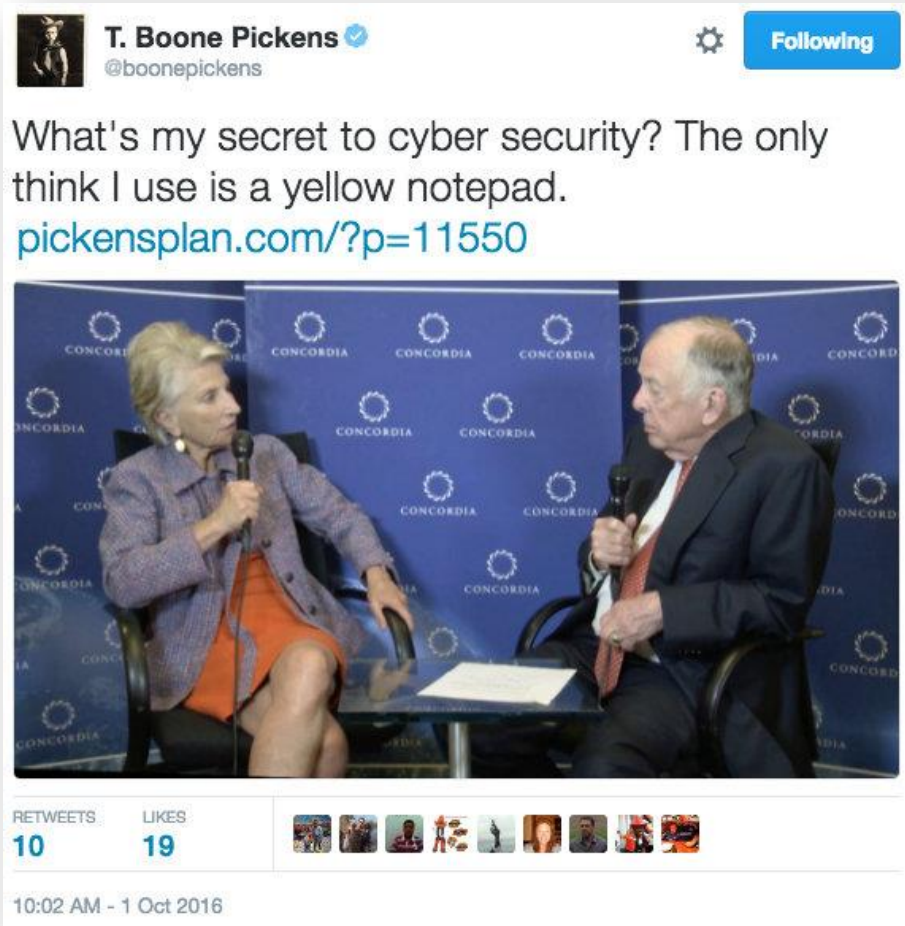


Financial Disclosure

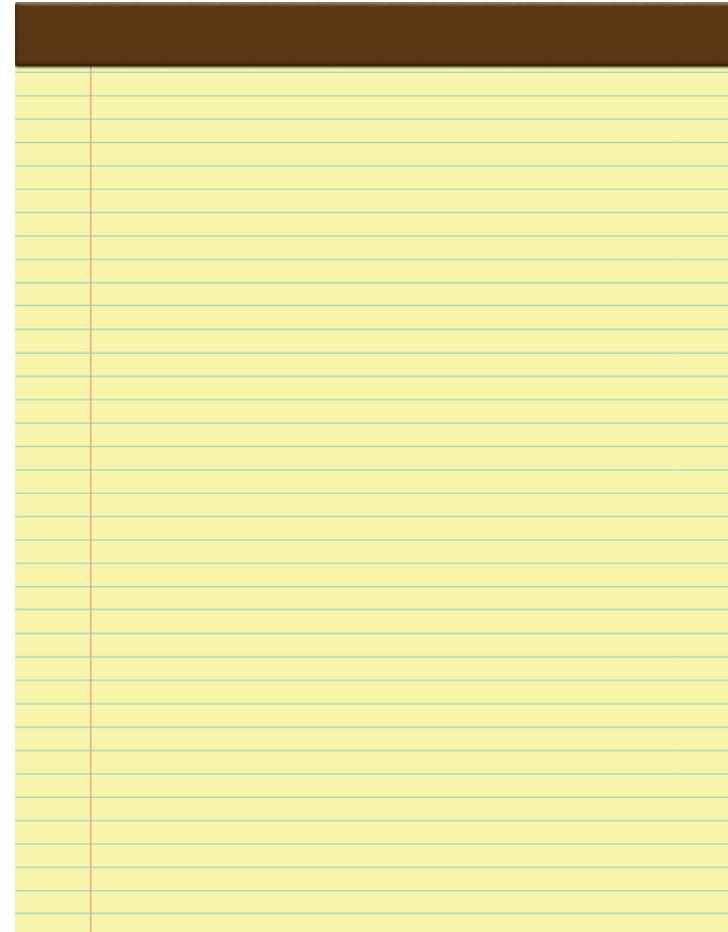
- I have the following financial interests or relationships to disclose:
 - DORC, LLC: Lecture Fees/Speakers Bureau
 - iVeena Delivery Systems Inc.: Equity/Stock Holder - Private Corp



T. Boone Pickens Idea of Cybersecurity ...



A screenshot of a tweet from T. Boone Pickens (@boonepickens) dated October 1, 2016. The tweet text reads: "What's my secret to cyber security? The only think I use is a yellow notepad." followed by a link to pickensplan.com/?p=11550. Below the text is a video thumbnail showing T. Boone Pickens and a woman in a panel discussion. The tweet shows 10 retweets and 19 likes.



The good old days

CC
HPI
ROS

VA
IOP

Anterior
Segment

Testing

Posterior
Segment

A/P

10:10 RDG

Date: AUG 19 2013 Name: _____ DOB: _____ Age: 76
 Last Exam: 4/15/13 Sent by: _____ Oc Meds: OD OS
 CC/HPI: blurry O_u (1/1/1) 10/10/10 10/10/10 10/10/10 10/10/10 10/10/10 10/10/10 10/10/10 10/10/10 10/10/10
 glaucoma eval, HVF Bion-BID-OU

POH: APE-OS, gl(s), mild NS ↑ cid os>od
 ROS: (see intake sheet) ep, arthritis Fish oil, vit D, cA, gluc chem

EOM: D & V Full OU VF: FTCTF OU P: RR(+) RAPD O() Neuro: & o x3 or
 Stereo: _____ Color: _____

VA:

	sc	cc (spec/CL)	ph	near	(cm)	OR
OD		10/9+1				
OS		10/9+1				

PC: OD: _____ OS: _____ MRx OD: _____ OS: _____
 CRx OD: _____ OS: _____

Myd 0.5%/1.0% Neo 2.5% C 1% OD/OS/OU at _____ by _____ T_s < 16 (at _____) T (p dil) < _____

External:

SLE: OD OS

	OD	OS
L/L	<input type="checkbox"/> wnl	<input type="checkbox"/> wnl
Conj/Scl	<input type="checkbox"/> w&q	<input type="checkbox"/> w&q
K	<input type="checkbox"/> clear	<input type="checkbox"/> clear
TBUT	<input type="checkbox"/> wnl	<input type="checkbox"/> wnl
AC	<input type="checkbox"/> D & Q	<input type="checkbox"/> D & Q
Iris	<input type="checkbox"/> reg	<input type="checkbox"/> reg
Lens	<input type="checkbox"/> clear	<input type="checkbox"/> clear
AVit	<input type="checkbox"/> no cells	<input type="checkbox"/> no cells

Gonio: *ASPH* Last HVF: *full* Last HRT: *4/13*

DFE: Media: *PVD* Disc: pink/sharp Macula: wnl Vessels: wnl Periphery: flat

Assessment & Plan: *10/10/10* *glaucoma suspect* *fields* *Atadw*

Discussed: Sunspecs MVI Amlier WC L/H AT () RDW BS control BP/ohol R/B/A cat ex YAG cap RTD: *4/13/13* Full/Ref CatV CapsV PO IOPV HRT HVF Pachy MaculaV CL Eval FUL Sign: *[Signature]*



EMR



Dashboard Summary 2/12/16 follow RG 2/3/16 follow RG 1/21/16 emerg O RG 8/6/15 dilated RG 4/2/15 dilated RG 12/14/14 kp Ck RG 7/2/14 dilated RG 2/20/14 dilated RG

2/12/16 11:00a

Subjective: Chief Complaint, HPI, Attachments, PI Communication, History, HISTORY (Ocular Med), MEDICATIONS, Inbound Referrals, Adverse, ROS, Mood/Orientation, Functional Status, VISION, Visual Acuity, Refractions, Contact Lens, Keratometry, Examinations, External Exam, IOP, Drops Administered, Slit Lamp Exam, Fundus, Orders, Lab Results, Assessment and Plan, DIAGNOSIS (ICD9/ICD10), MEDICATIONS, RETURN, ASSESSMENT/PLAN, Reminders, Testing Dates, Plan Goal, Outbound Referrals, PI Communication, Summary, IEM, Signature

Appointments

Followup	Description	Type	Status	Dept	Location	Provider	Assigned	Department	Entered	Type	Done	Ex. CS
2/12/16	Followup for As scheduled with Dr. Ravi Goel.	RG				RG			RDG 2/12/16			
2/3/16	Followup for dilated retina examination and Optical Coherence Tomography (OCT) of the retina, with Dr. S	RG				RG			RDG 2/3/16			
1/21/16	Followup for follow-up with Dr. Ravi Goel.	RG				RG			RDG 1/21/16			
8/6/15	Followup for dilated retina examination and Optical Coherence Tomography (OCT) of the retina, with Dr. S	RG				RG			RDG 8/6/15			
4/2/15	Followup for dilated retina examination and retina fundus photos, with Dr. Ravi Goel.	RG				RG			RDG 4/2/15			

Physician (0)

Last Name	First Name	Mi	Degree	Phone	Fax	Specialty	Practice	Comments

Problem List

Seq	Date	Diagnosed Date	Age of Onset	Provider	ICD9	ICD10	SNOMED CT	ICD9 Description	Location	Status	ICD10 Description	SNOMED CT Description	Health Status	Comments	Ex. CS	Last Modified Date	Source
1	01/21/16			RG	373.00	H01.009	41466000	Blepharitis, Unspecified		Active	Unspecified Blepharitis Unsp Eye Unsp	Blepharitis (disorder)		Anterior blepharitis	01/21/16 11:29:07	Inhouse Problem List	
2	01/21/16			RG	375.15	H04.123	46152009	Unspecified Tear Film Insuffic		Active	Dry Eye Syndrome Of Bilateral	Tear film insufficiency (disorder)		Dry Eyes (Warm)	01/21/16 11:29:07	Inhouse Problem List	
3	01/21/16			RG	918.1	S05.010A	62639000	Superficial Injury Of Cornea	OU	Active	Iry Conjunctival Corneal Abrasion W/O	Superficial injury of cornea (disorder)		Corneal abrasion	01/21/16 11:28:56	Inhouse Problem List	
4	09/06/15			RG	365.01	H40.013	81416004	Brdth Glauc: Opn Ang W/Brdth		Active	Open Angle W/Borderline FindLow	Open angle with borderline findings (disorder)		Glaucoma Suspect	08/06/15 10:33:50	Inhouse Problem List	
5	09/06/15			RG	366.16	H25.13	195999009	Nuclear Sclerosis Cataract		Active	Age-Related Nuclear Cataract	Nuclear senile cataract (disorder)		Mild/Moderate	08/06/15 10:33:25	Inhouse Problem List	
6	12/24/14			RG	375.15		46152009	Unspecified Tear Film Insuffic		Active	Tear film insufficiency (disorder)	Tear film insufficiency (disorder)		Dry Eyes (Warm)	04/02/15 11:00:07	Inhouse Problem List	
7	02/20/14			RG	367.0		38101003	Hypertropia		Active	Hypertropia	Hypertropia		Bumpiness	04/02/15 10:54:29	Inhouse Problem List	
8	02/20/14			RG	379.21			Vitreous Degeneration		Active	Vitreous Degeneration	Vitreous Degeneration		PIO with Handout		Inhouse Problem List	
9	02/20/14			RG	224.6			Benign Neoplasm Of Choroid	OU	Active	Benign Neoplasm Of Choroid	Choroidal Nevus		Choroidal Nevus		Inhouse Problem List	
10	02/20/14			RG	362.57		247153005	Druzen Of Retina		Active	Druzen Of Retina	Retinal drusen (finding)		Druzen	08/06/15 10:33:45	Inhouse Problem List	
11	02/20/14			RG	365.01		48795003	Brdth Glauc: Opn Ang W/Brdth		Active	Brdth Glauc: Opn Ang W/Brdth	Open angle with cupping of optic discs (disorder)		Glaucoma Suspect	04/02/15 11:00:02	Inhouse Problem List	
12	02/20/14			RG	366.16		359766000	Nuclear Sclerosis Cataract		Active	Nuclear Sclerosis Cataract	Nuclear sclerotic cataract (disorder)		Nuclear Cataract	04/02/15 10:59:55	Inhouse Problem List	

Plan (3)

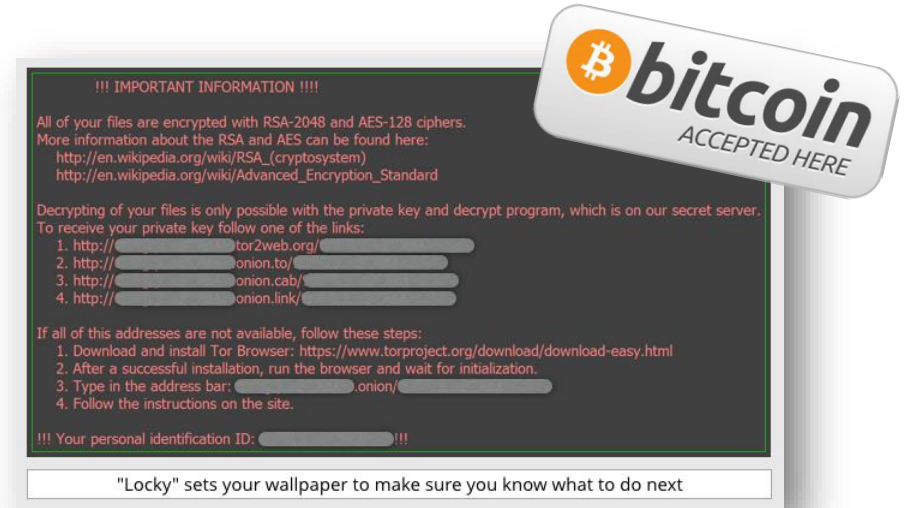
Date	Problems	Assessments/Types	Notes	Provider	Progress	Copy
2/12/16	H01.009 H04.123	Assessment and Plan; Return	1. Dry Eye Both Eyes (OU) - A. Warm Compresses- To create a warm compress, place dry rice in a cotton sock and microwave for about 30 seconds and until warm. Do not burn skin. Use warm compresses along lid margins with eyes closed for 5-10 minutes. Use 2 times a day. B. Artificial Tears (over the counter)- 2-3 times a day or as needed. 2. Blepharitis Both Eyes (OU) - The patient exhibits redness, crusty eyelid margins. Warm compresses recommended. 3. Corneal GL - 1 drop 2 times a day BOTH EYES	RG		
2/3/16	H01.009 H04.123 S05.010A	Assessment and Plan; Return	1. Corneal abrasion / erosion OD (Right Eye) - healed. 2. Dry Eye Both Eyes (OU) A. Warm Compresses- To create a warm compress, place dry rice in a cotton sock and microwave for about 30 seconds and until warm. Do not burn skin. Use warm compresses along lid margins with eyes closed for 5-10 minutes. Use 2 times a day. B. Artificial Tears (over the counter)- 2-3 times a day or as needed. 3. Blepharitis Both Eyes (OU) - The patient exhibits redness, crusty eyelid margins. Warm compresses recommended.	RG		
1/22/16		Assessment and Plan	Spoke with patient. take erythromycin ointment for 5 days total from time I saw patient.	RG		



Hollywood Presbyterian Medical Center



wikipedia (Junkyardsparkle)



2016 - 40 Bitcoin = \$17,000
2024 - 40 Bitcoin = \$2.2 million
(Annualized ROI 77%)



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Sophos.com screenshot - for **identification and critical commentary** relating to the website in question)



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Top 10 Hacking/IT Incidents



2.4 million

2 million

	Covered Entity	Individuals Affected
1	Welltok, Inc.	14,762,475
2	HCA Healthcare	11,270,000
3	Maximus, Inc.	9,179,226
4	Perry Johnson & Associates, Inc.	8,952,212
5	Managed Care of North America	8,861,076
6	PharMerica Corporation	5,815,591
7	HealthEC LLC	4,656,293
8	HealthEquity, Inc.	4,300,000
9	Reventics, LLC	4,212,823
10	Concentra Health Services, Inc.	3,998,163



133 million (2023)
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1. US Dept HHS Breach of Unsecured Protected Health Information https://ocrportal.hhs.gov/ocr/breach/breach_report
2. HIPAAJournal.com (133 million records & 725 data breaches in 2023)



CHANGE HEALTHCARE



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CHANGE HEALTHCARE



“...may bankrupt our practice of 50 years in this rural community...”

“This cyberattack is leading me to bankruptcy and I am just about out of cash”

“I am now going to get acquired by a hospital system because I just can't bear the financial responsibility”

“SOOOO much overtime dealing with this. Cost me additional \$50,000 in payroll.”

“...estimated \$100,000 in unexpected costs.”

“All of our expenses are being paid from my personal account”

“This crippled our brand new practice. I am keeping the lights on using personal funds.”

“I have not taken a salary for a month and am borrowing from personal funds to keep practice going”

AMA

Change Healthcare cyberattack impact

Key takeaways from informal AMA survey

Over 1,400 individuals responded to an informal AMA survey of the Federation of Medicine (feds medical associations and national medical specialty societies) on the impact of the [Change Healthcare cyberattack](#) on physician practices. The survey was open to respondents from March 20 – April 1, 2024. Respondents could skip questions; not all questions have 1,400 respondents.

Practice demographics: Most responses came from practices with fewer than 10 physicians.

1,257	Practices with 0-9 physicians
74	Practices with 10-20 physicians
30	Practices with 21-50 physicians
Additional details:	
432	Single-provider practices
1,367	Practices with 0-10 physicians

Over 77% of respondents have experienced service disruptions since Feb. 27 and are still feeling the effects of the cyberattack (n=1,365).

Respondents reported that several functionalities have been suspended, resulting in a substantial use of workarounds (n=941).

- Revenue functionality has resulted in:
 - 38% have experienced suspension in claim payments
 - 37% have not been able to submit claims
 - 25% have not been able to obtain electronic remittance advice
 - 22% have not been able to verify eligibility for benefits
- Comparable use of both manual and electronic workarounds:
 - 21% have employed both workarounds to be paid for claims
 - 21% have had to use both workarounds to submit claims
 - 25% have had to use both workarounds to obtain electronic remittance advice
 - 25% have had to use both workarounds to verify eligibility for benefits
- In addition, the survey revealed that many practices reported disruptions in electronic lab ordering.

Service disruptions from the cyberattack have led to severe consequences for physician practices (n=112):

- 80% have lost revenue from unpaid claims
- 80% have had to commit additional staff time/resources to complete revenue cycle tasks
- 70% have lost revenue from claims that they have been unable to submit
- 51% have lost revenue from the inability to charge patient co-pay or remaining obligations

“...may bankrupt our practice of 50 years in this rural community...”

“This cyberattack is leading me to bankruptcy and I am just about out of cash”

“I am now going to get acquired by a hospital system because I just can't bear the financial responsibility”

Physician practices are resilient, but observations from the cyberattack have forced practices to adapt (n=176):

- 20% of respondents had to use personal funds to cover practice expenses
- 47% were unable to purchase supplies
- 31% were unable to make payroll
- However, even facing all these payment and claim disruptions, only 10% of practices have reduced office hours

“Payroll taxes and gross receipts are not able to be paid, resulting in penalties. Other overhead costs are not able to be paid, also resulting in late fees.”

“Our bank account is not going to cover payroll taxes. We have not been on supply ordering.”

“...we are barely able to pay employees and can't pay our vendor.”

Physician practices are being forced to enter new and potentially costly arrangements with alternative clearinghouses (n=172):

- 42% of respondents have engaged alternative clearinghouses to conduct electronic transactions

“We couldn't afford the cost of doing this. Other clearinghouses are taking advantage of this and small practices like mine who are already suffering without funds coming in can't afford to pay these fees as much to take the time to switch clearinghouses.”

“Approximately \$70,000 just for the set-up of a 'back-up' clearinghouse. Additionally, one of our payers has changed clearinghouses, and they have told us that we are going to have an additional 2% charge on all claims, which will cost the organization approximately \$1,000,000”

Some practices are taking advantage of advance payments, temporary funding, assistance, and loans, but some practice (n=102):

- 50% of respondents said they used personal finances
- 17% of respondents have received assistance from CMS/Medicare
- 8.7% have received assistance from State Medicaid Plans
- Nearly 20% have received assistance from UnitedHealth Group/Optum
- 4.5% have received assistance from other health plans

“SOOOO much overtime dealing with this. Cost me additional \$50,000 in payroll.”

“...estimated \$100,000 in unexpected costs.”

“All of our expenses are being paid from my personal account”

“This crippled our brand new practice. I am keeping the lights on using personal funds.”

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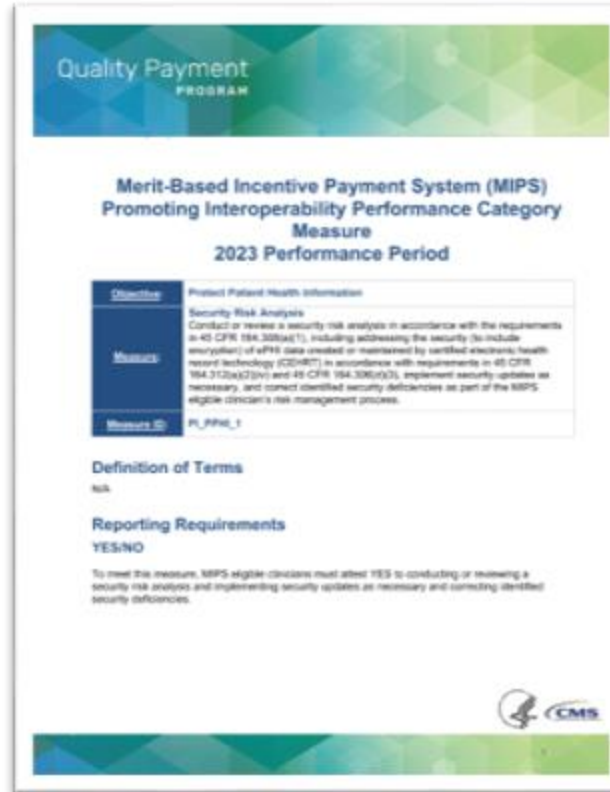
Many respondents are concerned about the negative impact this attack has had on patient care (n=102):

- “...patients had procedure delays due to both access”
- “...urgent scheduling prior authorization has been unable to get their medicines, I have no patient that was unable to get their biological for two months as she was unable to afford the cash out and her disease flared significantly.”
- “...ability to verify and accept patient insurance prior to visits, which then don't happen.”
- “...patients are suffering from delays in medical care and increased medical bills because alternative options could not be given with an appropriate volume because of the attack.”
- “Several access left under or get results”

The survey system demonstrates that significant problems continue, especially for small practices. The survey was conducted after clinical health through clinics used their claims against the timing by the members of March 20th. Despite initial announcements, service disruptions continue. The survey is also a reminder of the fragility of physician practices. [Visit the AMA website for more information.](#)



IRIS, MIPS, & Security Analysis



Meaningful Use & Security Risk Assessment



HealthIT.gov

Providers & Professionals | Patients & Families | Policy Researchers & Implementers

Benefits of EHRs | How to Implement EHRs | Privacy & Security | EHR Incentives & Certification | Success Case

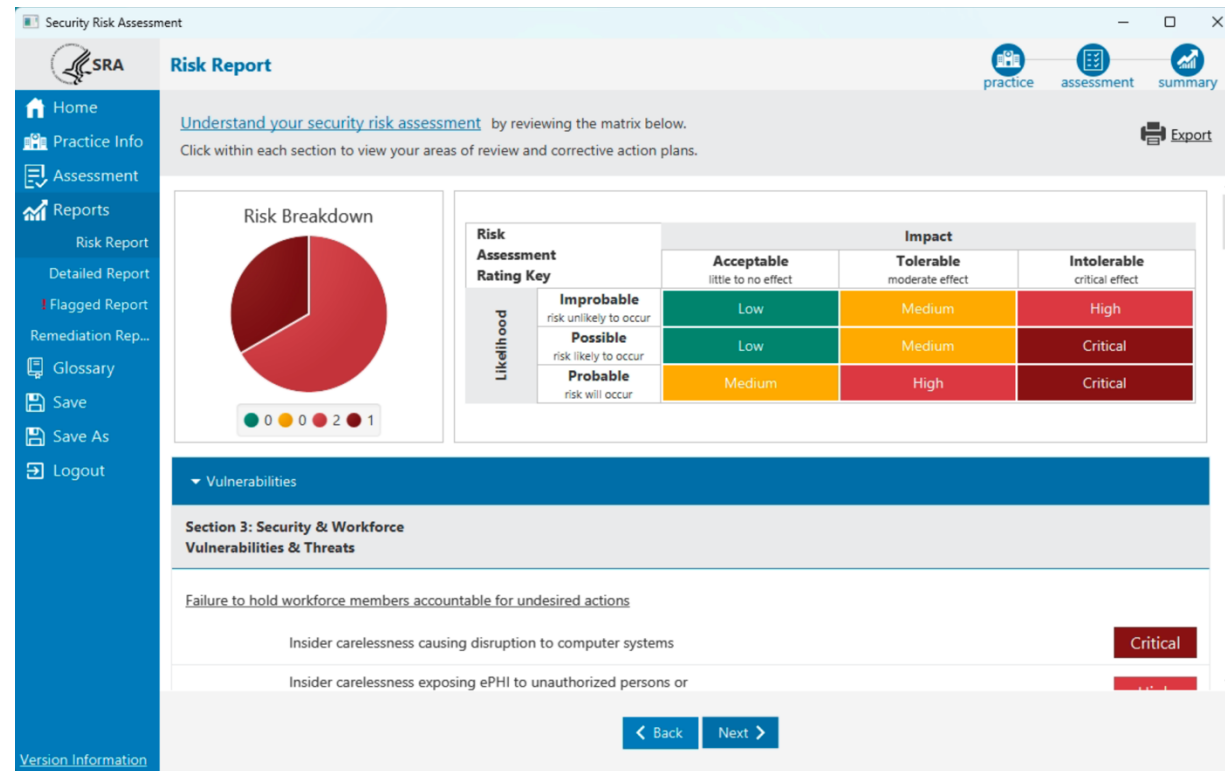
Security Risk Assessment

HealthIT.gov > 1 For Providers & Professionals > 1 Privacy & Security > 1 Security Risk Assessment > 1 Top 10 Myths of Security Risk Analysis

Top 10 Myths of Security Risk Analysis

As with any new program or regulation, there may be misinformation making the rounds. The following is a top 10 list distinguishing fact from fiction.

- The security risk analysis is optional for small providers.
 - False. All providers who are "covered entities" under HIPAA are required to perform a risk analysis. In addition, all providers who want to receive EHR incentive payments must conduct a risk analysis.
- Simply installing a certified EHR fulfills the security risk analysis MU requirement.
 - False. Even with a certified EHR, you must perform a full security risk analysis. Security requirements address all electronic protected health information you maintain, not just what is in your EHR.
- My EHR vendor took care of everything I need to do about privacy and security.
 - False. Your EHR vendor may be able to provide information, assistance, and training on the privacy and security aspects of the EHR product. However, EHR vendors are not responsible for making their products compliant with HIPAA Privacy and Security Rules. It is solely your responsibility to have a complete risk analysis conducted.
- I have to outsource the security risk analysis.
 - False. It is possible for small practices to do risk analysis themselves using self-help tools. However, doing a thorough and professional risk analysis that will stand up to a



Security Risk Assessment

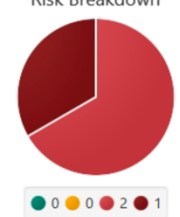
SRA Risk Report

practice assessment summary

Home | Practice Info | Assessment | Reports | Remediation Rep... | Glossary | Save | Save As | Logout

Understand your security risk assessment by reviewing the matrix below. Click within each section to view your areas of review and corrective action plans. Export

Risk Breakdown



Risk Assessment Rating Key		Impact		
		Acceptable little to no effect	Tolerable moderate effect	Intolerable critical effect
Likelihood	Improbable risk unlikely to occur	Low	Medium	High
	Possible risk likely to occur	Low	Medium	Critical
	Probable risk will occur	Medium	High	Critical

▼ Vulnerabilities

Section 3: Security & Workforce Vulnerabilities & Threats

Failure to hold workforce members accountable for undesired actions

Insider carelessness causing disruption to computer systems	Critical
Insider carelessness exposing ePHI to unauthorized persons or	Critical

Version Information | < Back | Next >



Security Risk Analysis

- Pearl #1 – Define Scope of Security Risk Analysis
- Pearl #2 – Gather data
- Pearl #3 – Identify potential threats
- Pearl #4 – Assess Existing Security Measures
- Pearl #5 – Determine Likelihood of Threat Occurrence
- Pearl #6 – Determine the Level of Risk
- Pearl #7 – Identify and Document Improved Security Measures





Top 10 Tips for Cybersecurity in Health Care



- ▶  1. Establish a Security Culture
- ▶  2. Protect Mobile Devices
- ▶  3. Maintain Good Computer Habits
- ▶  4. Use a Firewall
- ▶  5. Install and Maintain Anti-Virus Software
- ▶  6. Plan for the Unexpected
- ▶  7. Control Access to Protected Health Information
- ▶  8. Use Strong Passwords and Change Them Regularly
- ▶  9. Limit Network Access
- ▶  10. Control Physical Access





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Unsplash

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Ravi's Practical Pearls 2024

- Pearl #1 – Who is your IT specialist? Could you text them right now?
- Pearl #2 – Who backs up the data? How often? On-site or off site?
- Pearl #3 – Does your team use internet from desktops or server?
- Pearl #4 – Are all mobile devices encrypted? Wifi secure?
- Pearl #5 – How often is your security software backed up?
- Pearl #6 – Business Associates Agreements (40% = 275 of 734 breaches)
- Pearl #7 – Don't outsource cybersecurity!





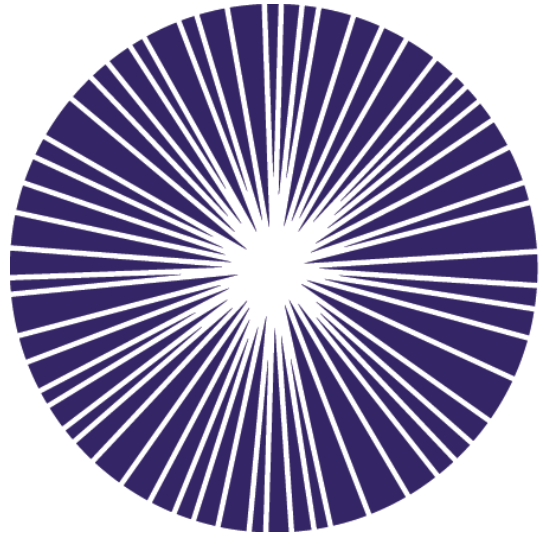
RaviGoelMD@gmail.com

 @RaviGoelMD 

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