



Evidence Solutions, Inc.

And

The Arizona Chapter of the  
American Association of Legal Nurse Consultants

Arizona Chapter of the AALNC

Present:

Electronic Medical Record Forensics

EMR Forensics

March 13, 2018

Presented by:

Scott Greene, SCFE, CEO

[Evidence Solutions, Inc.](#)

A Computer Forensics Firm

Based in Arizona Serving Clients Nationwide

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# Case Studies in Electronic Medical Record Data Manipulation

Faculty:  
Scott Greene

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## Scott Greene

- Has been doing computer consulting for over 35 years.
- Performing:
  - Custom programming
  - Design and optimization
  - Database administration
  - Network and workstation general support
- For:
  - Service
  - Retail
  - Hospitality
  - Legal
  - Manufacturing
  - Medical

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## How am I going to get there?

- A Civil Case: Medical Billing
- With a few other things thrown in...
  - EMR Forensics For Instance

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## Electronically Stored Information in Litigation

- Frequently we are presented with data that appears perfectly normal and supports a particular side to a case.
- Unfortunately software, displays data in a sorted and organized form. Manipulated Data will not be evident when looking at standard reports.

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## Reasons to examine electronic data

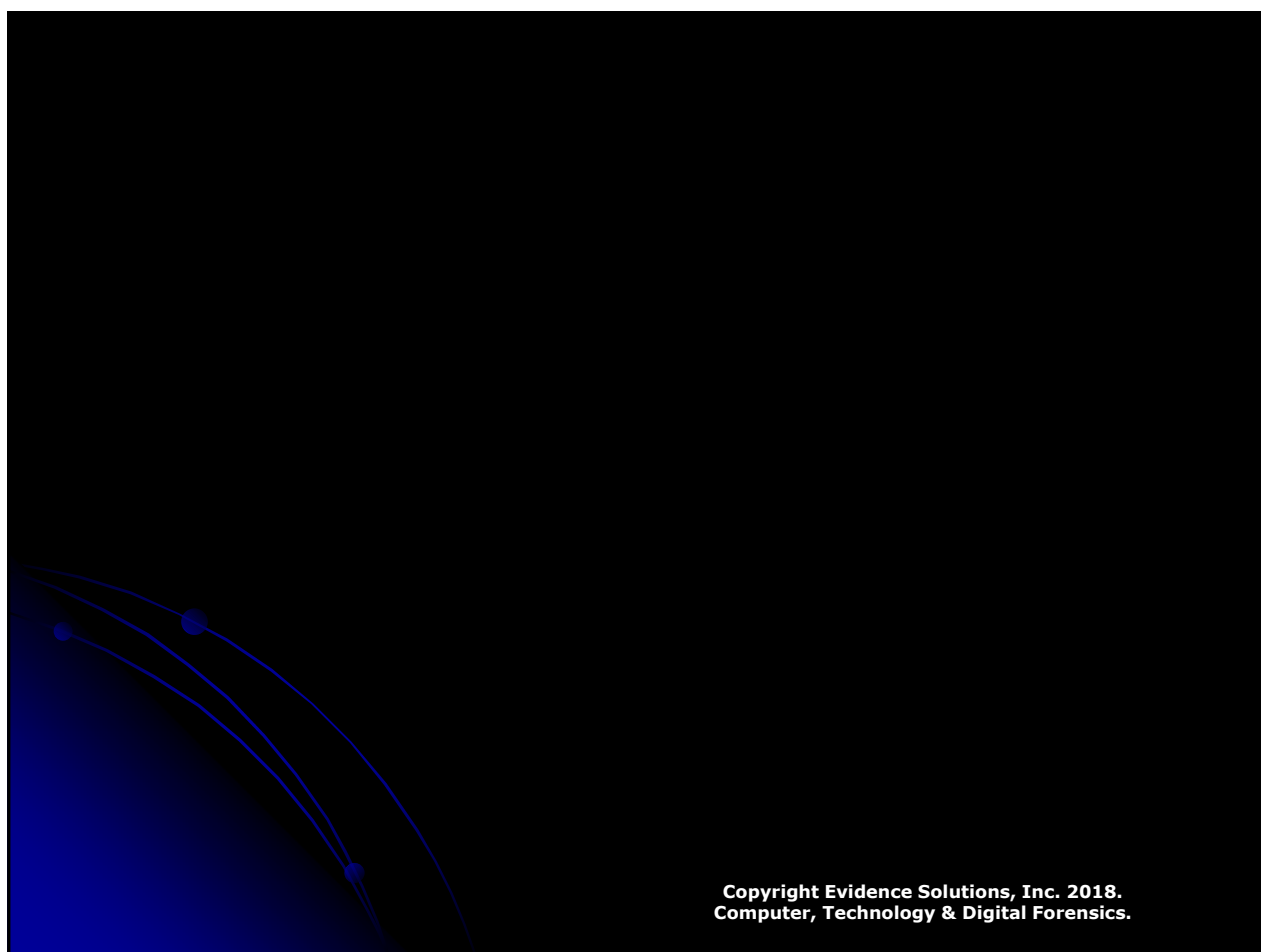
- Almost all documents are now 'word processing' documents.
- Nearly all business activities are now computerized
- E-mail communications have surpassed telephone and postal ( snail mail ) communication.
- Text Messages now overshadow E-mail

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## What can data Forensics Tell Us?

- Almost Everything: from the character of the user to their interests, activities, financial health, acquaintances and more.
- Collected from their life online: applications, email systems, web browsers and free space.
- The details from their life, outlook, intelligence and interactions are as individual as any fingerprint.
- All Public & Private business transactions, communications with accomplices, fraud indicators and much more are frequently available.

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## Billing Case

- Plaintiff Company:
  - Contracted to bill for a high end medical specialist with his own surgical facility.
  - Maintained:
    - That they properly billed for all services.
    - The did so in a timely manner.

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## Billing Case

- Defendant Doctor/Surgical Facility
  - Maintained that the Plaintiff did not bill timely
  - Determined that the Plaintiff chose to concentrate on the large ticket bills

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## Case BS ( Before Scott )

- Procedural issues of the billing dispute
- Discovery disputes – billing company claimed that it didn't have certain data
- Arbitrator failed to order production of billing software until eve of arbitration

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## Scott's Special Master Tasks

- Evidence Solutions was tasked with analyzing the software and determining what standard reports were available from the system.

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## Scott's Special Master Tasks

- Unable to get the software running we decided to look at the data.

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# The first report from the database.

claction1 package.pdf

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Recno	Claim	Idnum	Date	Type	Note	Resp	Dateent	Timeent	Whoentered
12966	3167	1279	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC	01/14/09	16:07	SMW
12967	3216	1279	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC	01/14/09	16:07	SMW
12968	1249	774	01/14/09	SECONDARY	SECONDARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
12969	1246	774	01/14/09	SECONDARY	SECONDARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
12970	1541	845	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
12971	3221	1369	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
12972	3084	1369	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
12973	1778	968	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
12974	1333	818	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	UNI6	01/14/09	16:09	SMW
12975	2849	1295	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	TRI2	01/14/09	16:09	SMW
12976	2858	1304	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	TRI2	01/14/09	16:09	SMW
12977	1392	830	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED	CIG1	01/14/09	16:09	SMW
12978	1834	485	02/18/09	PRIMARY	PRIMARY CLAIM PRINTED	CIGN	02/18/09	18:36	KW
12979	1692	485	02/18/09	RECEIPT	CLAIM RECEIPT PRINTED		02/18/09	18:36	KW
12980	1692	485	02/18/09	PRIMARY	PRIMARY CLAIM PRINTED	CIGN	02/18/09	18:36	KW
12981	2201	878	02/26/09	RECEIPT	CLAIM RECEIPT PRINTED		02/26/09	12:20	SMW
12982	280	231	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12983	283	243	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12984	272	209	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12985	1799	980	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12986	1871	980	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12987	1897	987	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12988	1966	987	12/31/06	STATEMENT	STATEMENT PRINTED >120		12/31/06	12:32	SMW
12989	3282	1416	12/31/06	STATEMENT	STATEMENT PRINTED 31-60		12/31/06	12:32	SMW

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Recno	Claim	Idnum	Date	Type	Note
12966	3167	1279	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
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12968	1249	774	01/14/09	SECONDARY	SECONDARY CLAIM PRINTED
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12971	3221	1369	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12972	3084	1369	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12973	1778	968	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12974	1333	818	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12975	2849	1295	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12976	2858	1304	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12977	1392	830	01/14/09	PRIMARY	PRIMARY CLAIM PRINTED
12978	1834	485	02/18/09	PRIMARY	PRIMARY CLAIM PRINTED
12979	1692	485	02/18/09	RECEIPT	CLAIM RECEIPT PRINTED
12980	1692	485	02/18/09	PRIMARY	PRIMARY CLAIM PRINTED
12981	2201	878	02/26/09	RECEIPT	CLAIM RECEIPT PRINTED
12982	280	231	12/31/06	STATEMENT	STATEMENT PRINTED >120
12983	283	243	12/31/06	STATEMENT	STATEMENT PRINTED >120
12984	272	209	12/31/06	STATEMENT	STATEMENT PRINTED >120
12985	1799	980	12/31/06	STATEMENT	STATEMENT PRINTED >120
12986	1871	980	12/31/06	STATEMENT	STATEMENT PRINTED >120
12987	1897	987	12/31/06	STATEMENT	STATEMENT PRINTED >120
12988	1966	987	12/31/06	STATEMENT	STATEMENT PRINTED >120
12989	3282	1416	12/31/06	STATEMENT	STATEMENT PRINTED 31-60

Note	Resp	Dateent	Timeent	Who
PRIMARY CLAIM PRINTED	UHC	01/14/09	16:07	SMW
PRIMARY CLAIM PRINTED	UHC	01/14/09	16:07	SMW
SECONDARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
SECONDARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
PRIMARY CLAIM PRINTED	UHC	01/14/09	16:08	SMW
PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
PRIMARY CLAIM PRINTED	UHC2	01/14/09	16:08	SMW
PRIMARY CLAIM PRINTED	UNI6	01/14/09	16:09	SMW
PRIMARY CLAIM PRINTED	TRI2	01/14/09	16:09	SMW
PRIMARY CLAIM PRINTED	TRI2	01/14/09	16:09	SMW
PRIMARY CLAIM PRINTED	CIG1	01/14/09	16:09	SMW
PRIMARY CLAIM PRINTED	CIGN	02/18/09	18:36	KW
CLAIM RECEIPT PRINTED		02/18/09	18:36	KW
PRIMARY CLAIM PRINTED	CIGN	02/18/09	18:36	KW
CLAIM RECEIPT PRINTED		02/26/09	12:20	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED >120		12/31/06	12:32	SMW
STATEMENT PRINTED 31-60		12/31/06	12:32	SMW

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# Claims Without Payment

nopaymentclaims prov B 0  
payment.pdf

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Claims with No Payment Detail Report (n  
Sorted by 'Claim'.

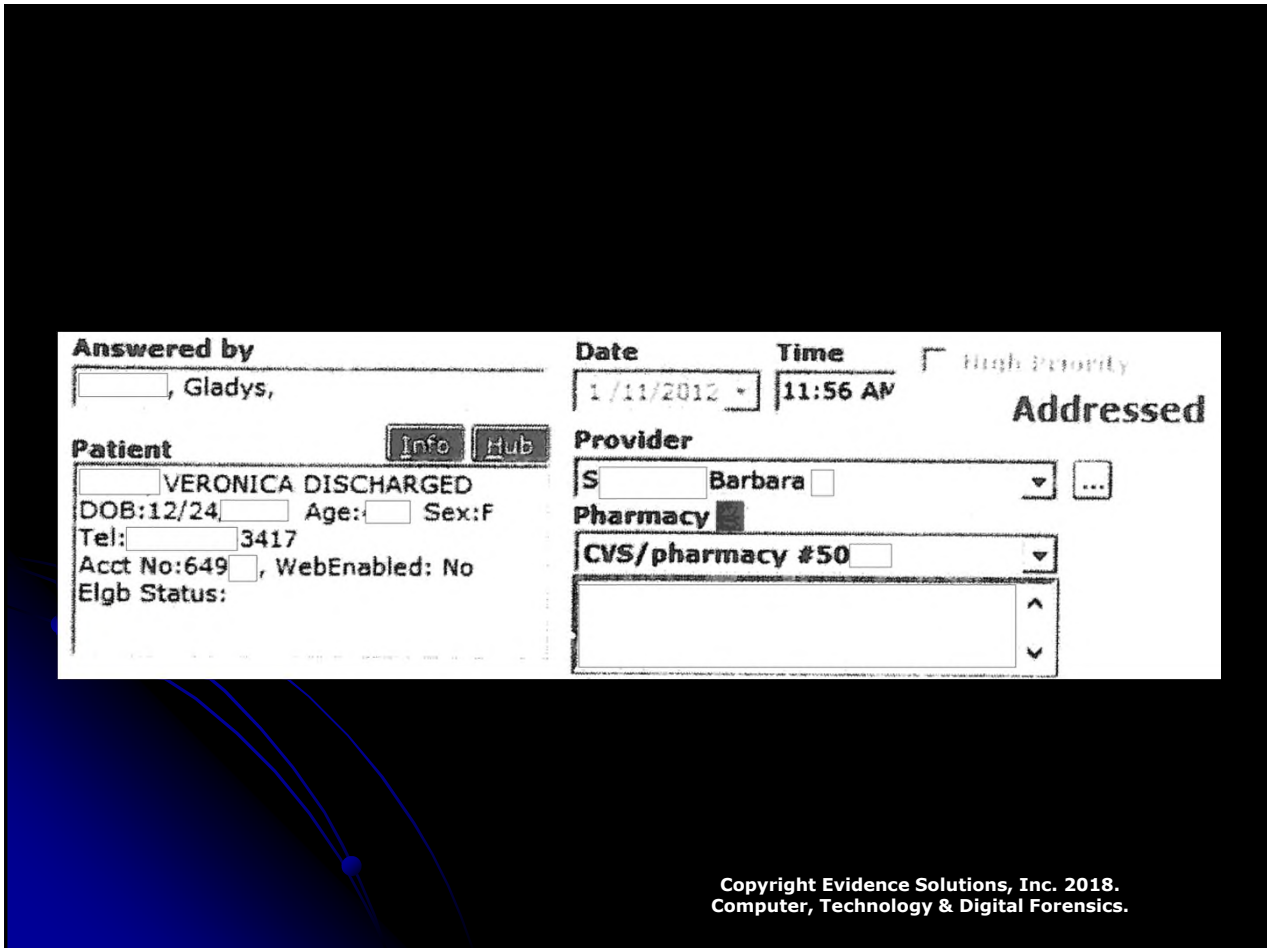
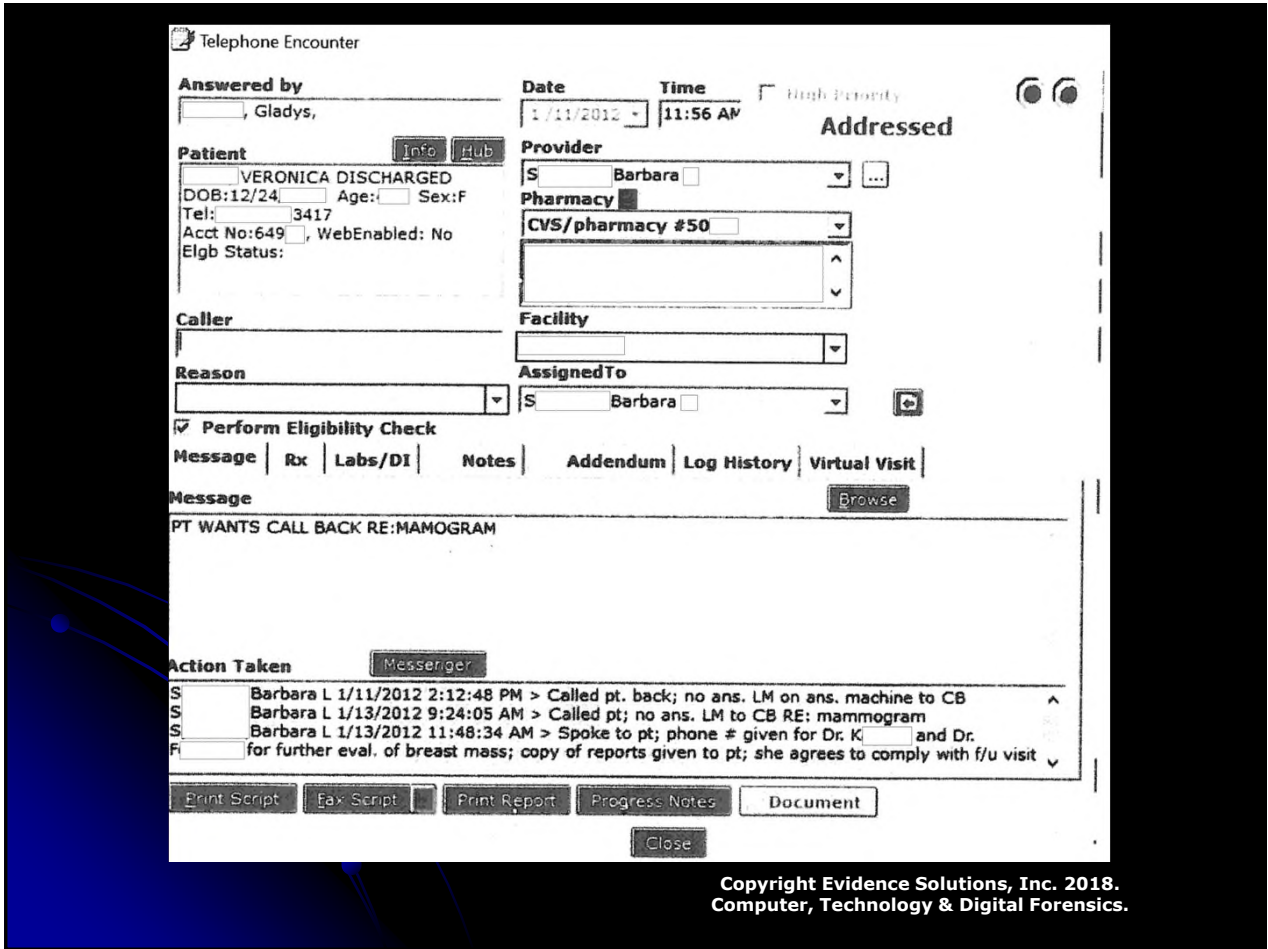
Patient	Claim Date	Claim Dateent	Claim Number	Provider	Procedure Amount
75	02/22/05	04/13/05	77	B	3,500.00
77	04/13/05	04/13/05	79	B	12,500.00
Total for: April					16,000.00
Grand Total for Report:					16,000.00

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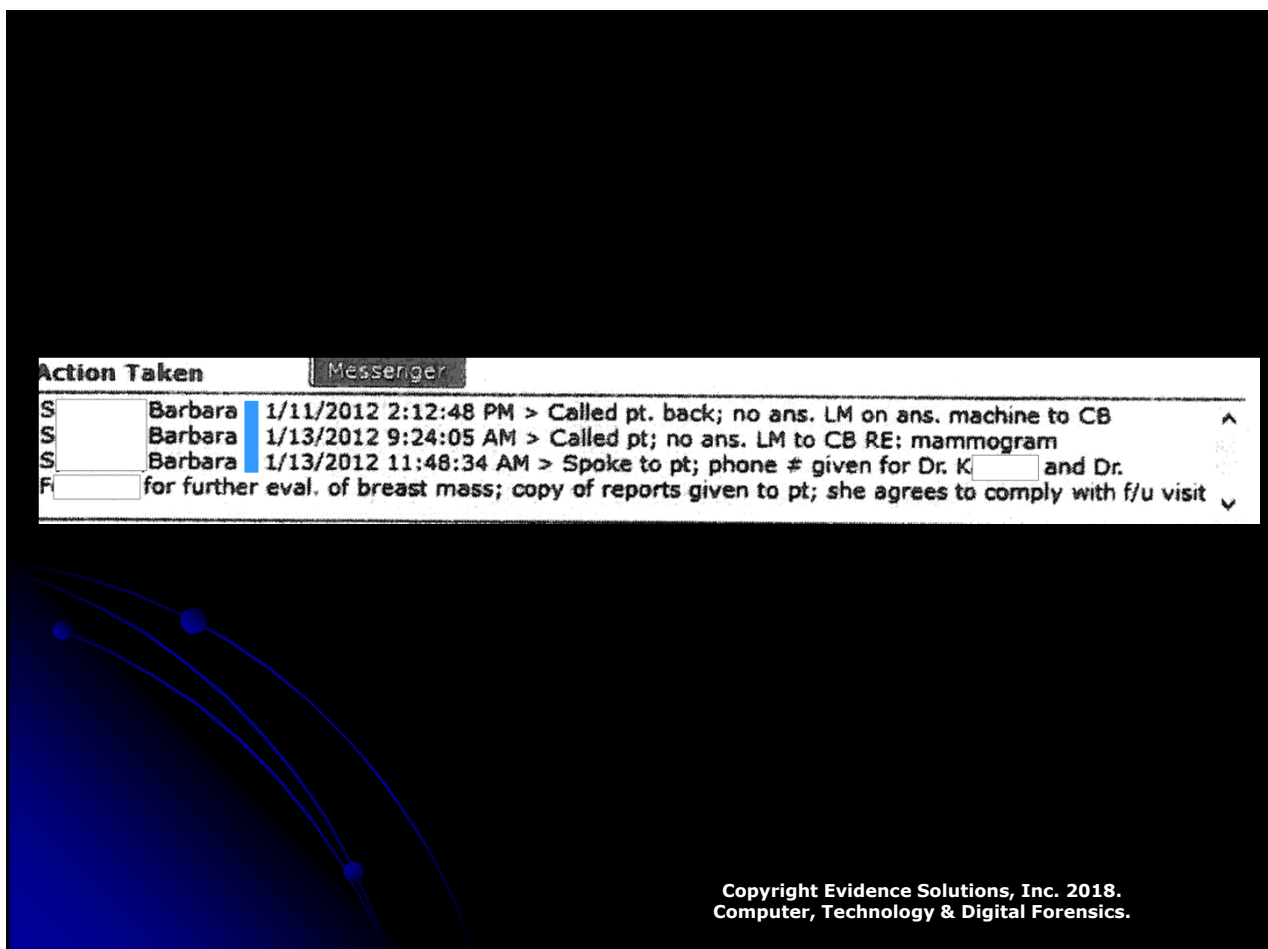
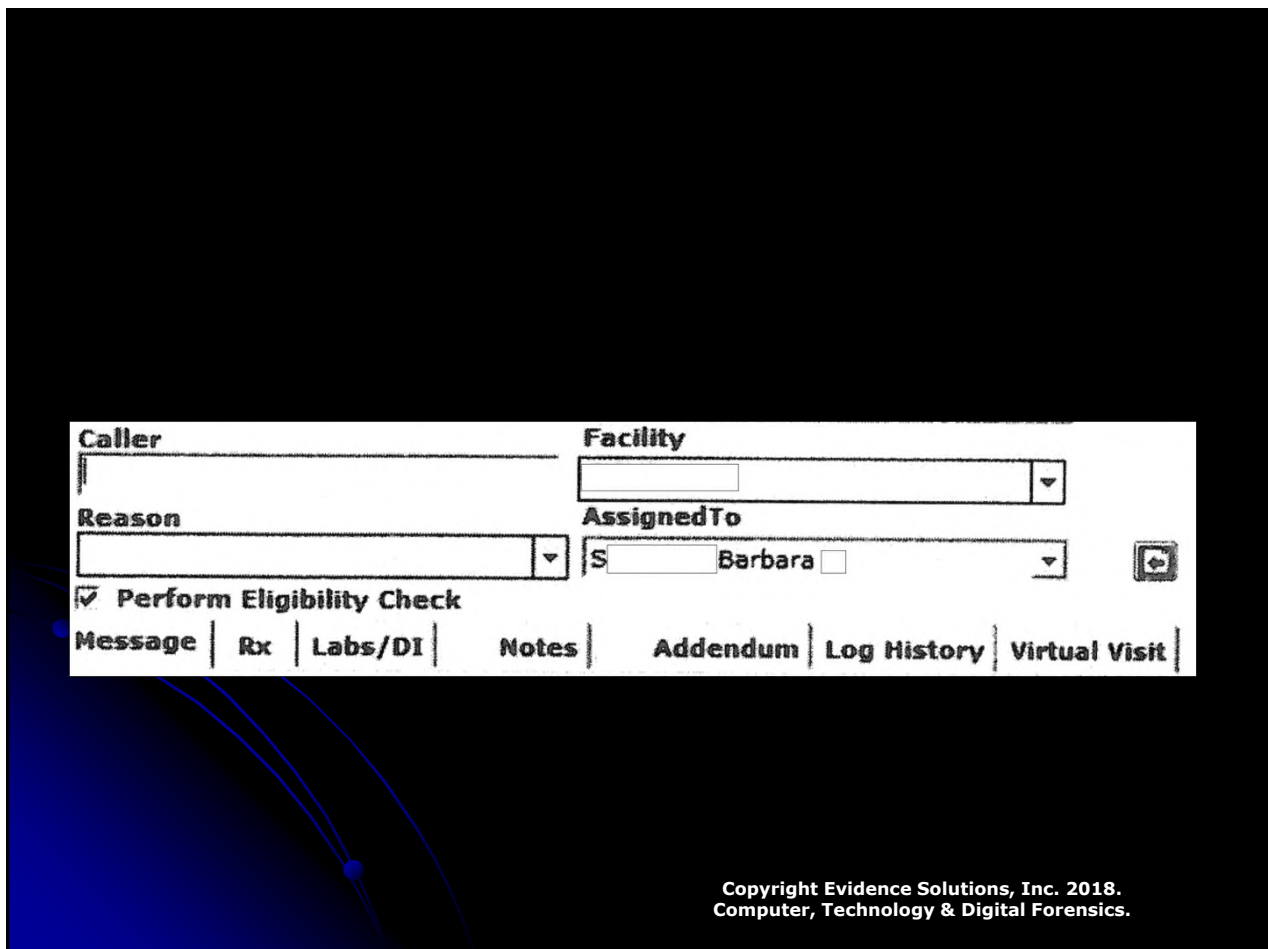
Payment Amount	%	Adjustment or Writeoff Amount	%	Write off Date	Activity Dateent
0.00	0.0	-3,500.00	100.0	09/27/05	09/27/05
0.00	0.0	-12,500.00	100.0	12/31/06	05/14/09
0.00		-16,000.00			
0.00	0.0	-16,000.00	100.0		

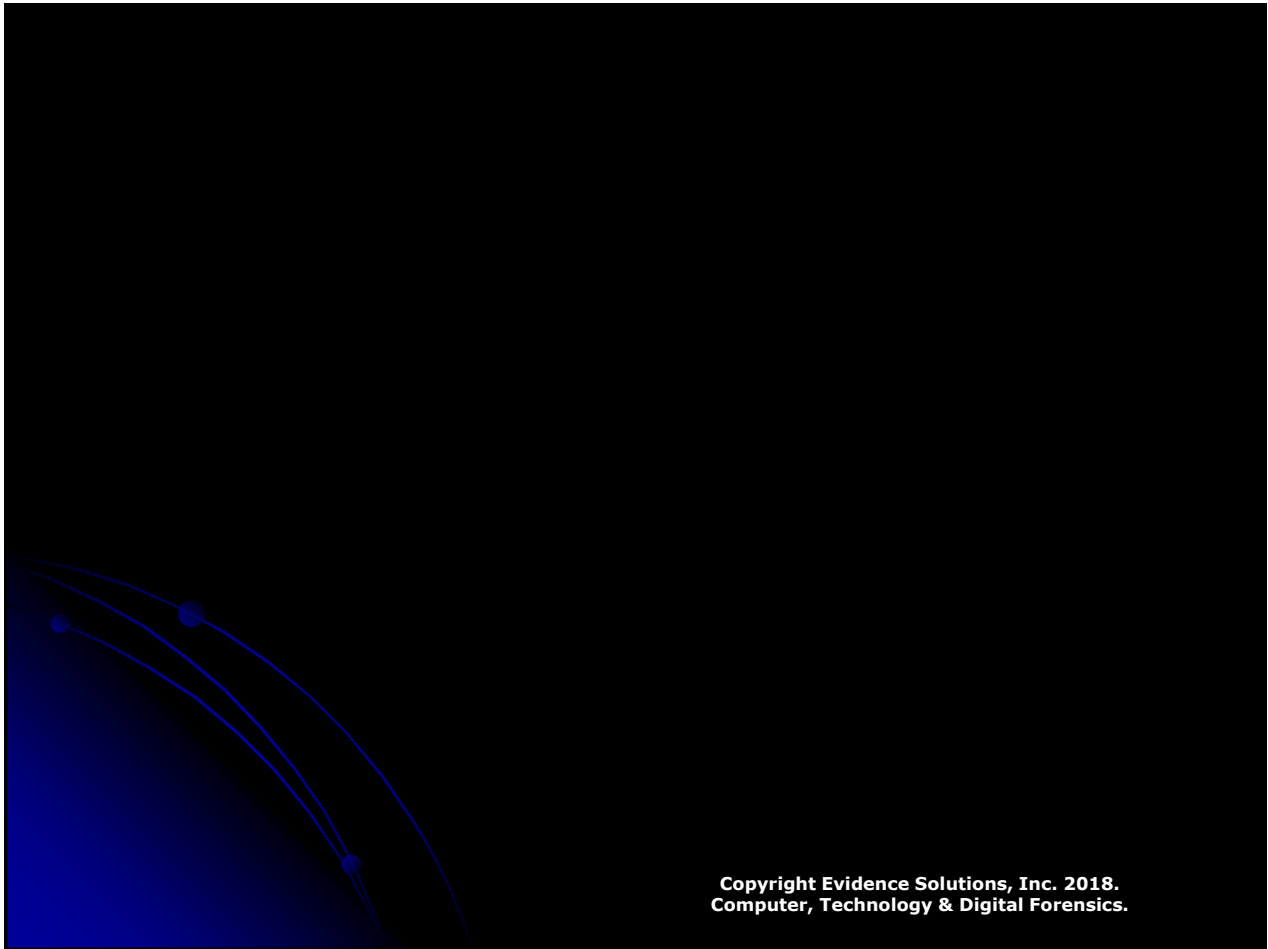
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# EMR Data What to Look For

6/18/2012 3:05:23 PM	F800209	View	5769395	CCF IP NURSING ORDERS ONE DAY [120100760]	MR_REPORTS
6/18/2012 3:06:21 PM	F800209	View	5769395	CCF IP NURSING ORDERS ONE DAY [120100760]	MR_REPORTS
6/18/2012 3:06:16 PM	F800209	View	5769395	FLW ORD ACKNOWLEDGEMENT [120101031]	MR_REPORTS
6/18/2012 3:06:00 PM	F800209	View	5769395	Weston All Report [120101450]	MR_REPORTS
6/18/2012 3:05:59 PM	F800209	View	5769395	HOSPITAL ENCOUNTER 05/11/2012	UOW_RELATED_ENCOUNTERS
6/18/2012 3:05:53 PM	F800209	View	5769395	FLW IP ENCOUNTER REPORT [120100378]	MR_REPORTS
6/18/2012 3:05:52 PM	F800209	View	5769395	REGISTRATION REPORT (HTML) [80051003]	MR_REPORTS
6/15/2012 19:52	F800209	View	5769395	Weston All Report [4045002]	MR_PATIENT_SELECT
6/15/2012 19:47	Exit	Exit		HOSP ENC 5/11/2012	Clinical Notes
6/15/2012 19:47	Exit	Exit		HOSP ENC 5/11/2012	Inpatient MAR
6/15/2012 19:47	Exit	Exit		N/A	Allergies
6/15/2012 19:47	Exit	Exit		HOSP ENC 5/11/2012	Encounter
6/15/2012 19:47	Exit	Exit		HISTORY 6/12/2012	History
6/15/2012 19:47	View	View		N/A	Chart Review Imaging tab
6/15/2012 19:47	View	View		N/A	Chart Review Encounters tab
6/15/2012 19:47	View	View		N/A	Report
6/15/2012 19:43	View	View		HOSP ENC 5/11/2012	Inpatient MAR

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# EMR Data What to Look For

6/18/2012 3:06:29 PM	F800209	View
6/18/2012 3:06:21 PM	F800209	View
6/18/2012 3:06:16 PM	F800209	View
6/18/2012 3:06:00 PM	F800209	View
6/18/2012 3:05:59 PM	F800209	View
6/18/2012 3:05:53 PM	F800209	View
6/18/2012 3:05:52 PM	F800209	View
6/18/2012 3:05:51 PM	F800209	View
6/15/2012 19:52		Exit
6/15/2012 19:52		Exit
6/15/2012 19:52		Exit
6/15/2012 19:52		Exit
6/15/2012 19:47		View
6/15/2012 19:47		View
6/15/2012 19:47		View
6/15/2012 19:43		View

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# EMR Data What to Look For

5769395	CCF IP NURSING ORDERS ONE DAY [120100760]	MR_REPORTS
5769395	CCF IP NURSING ORDERS ONE DAY [120100760]	MR_REPORTS
5769395	FLW ORD ACKNOWLEDGEMENT [120101031]	MR_REPORTS
5769395	Weston All Report [120101450]	MR_REPORTS
5769395	HOSPITAL ENCOUNTER 05/11/2012	UCW_RELATED_ENCOUNTERS
5769395	FLW IP ENCOUNTER REPORT [120100378]	MR_REPORTS
5769395	REGISTRATION REPORT (HTML) [90051003]	MR_REPORTS
5769395		MR_PATIENT_SELECT
		Clinical Notes
		Inpatient MAR
		Allergies
		Encounter
		History
		Chart Review Imaging tab
		Chart Review Encounters tab
		Report
		Inpatient MAR
	Weston All Report [4045002]	
	HOSP ENC 5/11/2012	
	HOSP ENC 5/11/2012	
	N/A	
	HOSP ENC 5/11/2012	
	HISTORY 6/12/2012	
	N/A	
	N/A	
	N/A	
	HOSP ENC 5/11/2012	

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Rank	TIMESTAMP	MRN	PATIENT NAME	FACILITY	NURSE_UNIT
0	11/20/2011 16:38:51 EST	ESI936273	MARY	SMY	EMRM
1	11/20/2011 16:39:07 EST	ESI936273	MARY	SMY	EMRM
2	11/20/2011 16:39:07 EST	ESI936273	MARY	SMY	EMRM
3	11/20/2011 16:39:08 EST	ESI936273	MARY		
4	11/20/2011 16:41:58 EST	ESI936273	MARY	SMY	EMRM
5	11/20/2011 16:42:05 EST	ESI936273	MARY	SMY	EMRM
6	11/20/2011 16:42:05 EST	ESI936273	MARY	SMY	EMRM
7	11/20/2011 16:42:05 EST	ESI936273	MARY	SMY	EMRM
8	11/20/2011 16:42:06 EST	ESI936273	MARY	SMY	EMRM
9	11/20/2011 16:42:06 EST	ESI936273	MARY		
10	11/20/2011 16:42:06 EST	ESI936273	MARY	SMY	EMRM
11	11/20/2011 16:42:07 EST	ESI936273	MARY	SMY	EMRM
12	11/20/2011 16:44:05 EST	ESI936273	MARY	SMY	EMRM
13	11/20/2011 16:44:06 EST	ESI936273	MARY	SMY	EMRM

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USER_NAME	PRSNL_NAME	ROLE	DEVICE_NAME	CITRIX_SERVER
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO
RJOHNSON1	Ryan	AHTU_PathNet: Medical Technologist	BA108588	AHTUAZCTX19
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO
SYSTEM	SYSTEM	DBA	ahtuaz2	NO INFO

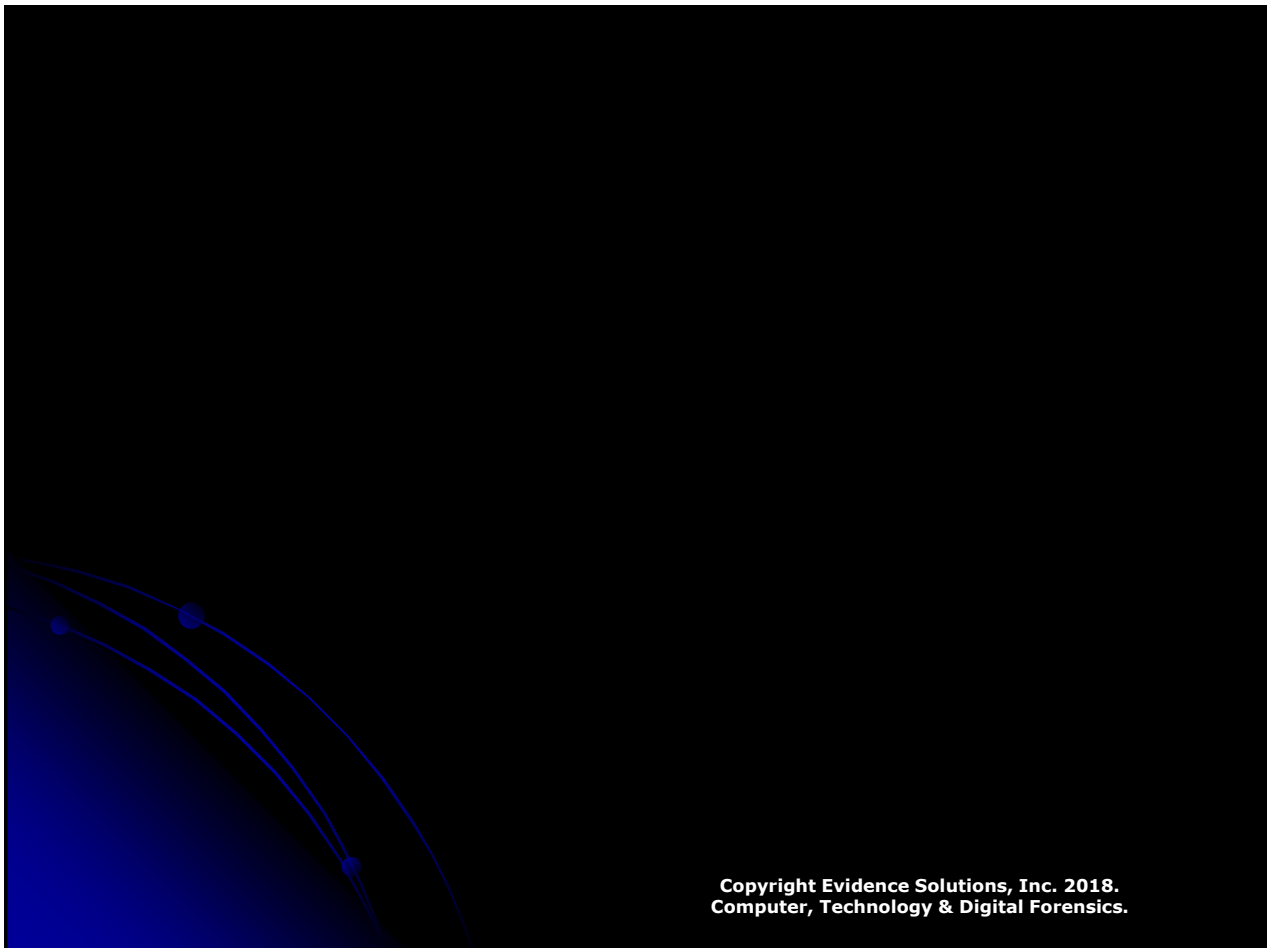
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APPLICATION	EVENT_NAME	EVENT_TYPE
PathNet General Lab: Accession Result Entry	Lab Common Inquiry	View Results
PathNet General Lab: Accession Result Entry	Lab Common Modify	Maintain Results
PathNet General Lab: Accession Result Entry	Maintain Order	Tasks
PathNet General Lab: Accession Result Entry	Maintain Clinical Events	Write/Update Results
PathNet General Lab: Accession Result Entry	Lab Common Inquiry	View Results
PathNet General Lab: Accession Result Entry	Lab Common Modify	Maintain Results
PathNet General Lab: Accession Result Entry	Maintain Order	Tasks
Servers and Services: Discern Expert Server	View Orders	Modify Details
Servers and Services: Discern Expert Server	View Orders	Modify Details
PathNet General Lab: Accession Result Entry	Maintain Clinical Events	Write/Update Results
Server: Orm Order Write	Maintain Order	Tasks
Server: Orm Order Write	Maintain Order	Tasks
Server: Inbound Dispense Server	Maintain Order	Medication
Server: Inbound Dispense Server	Maintain Order	Medication

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task	PARTICIPANT_ID_TYPE	PARTICIPANT_ID	PARTICIPANT_NAME
	Accession	7281766 11-324-01330	
	Accession	7281766 11-324-01330	
			Urine, Nurse collect, Collected, Start Date 11/20/11 13:55, Stat collect, 11/20/11 13:55, Clean Catch, Urine Culture if nitrite + or >., 10 WBC/hpf or Leukocytes
UPDATE: Results	Order	303398568	Reason: ul symptoms
UPDATE: Results	Patient	2187382	Mary
	Accession	7281763 11-324-01327	
	Accession	7281763 11-324-01327	
UPDATE: Results	Order	303393269	Blood, Nurse collect, Stat collect, Start Date 11/20/11 13:41, 11/20/11 13:41
RUN Discern Expert: Server Task	Order	303393269	Blood, Nurse collect, Stat collect, Start Date 11/20/11 13:41, 11/20/11 13:41
RUN Discern Expert: Server Task	Order	303393269	Blood, Nurse collect, Stat collect, Start Date 11/20/11 13:41, 11/20/11 13:41
UPDATE: Results	Patient	2187382	Mary
UPDATE: SCS Netting Task	Order	303403241	Blood, Nurse collect, Collected, Stat collect, Start Date 11/20/11 13:55, 11/20/11 13:55
UPDATE: SCS Netting Task	Order	303403248	Blood, Nurse collect, Collected, Stat collect, Start Date 11/20/11 13:55, 11/20/11 13:55
RUN Fill Server	Order	303393436	4 mg. = 1 mL, Soln, IV Push, q30min, PRN, PRN Reason Pain, Routine, Start Date 11/20/11 13:41, Max total = 12 mg, ED order only
RUN Fill Server	Order	303397652	Soln, As Directed, Once, Start Date 11/20/11 14:05, Physician Stop, Stop date 11/20/11 14:05

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## What to Ask for?

- **Request for Production**
- **No. 1**: All information in your possession regarding your patient Jane Smith. This request is specifically intended to require production of information beyond what may be deemed the medical records or the “designated record set.”

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## What to Ask for?

- **No. 1:** In the event you maintain an electronic medical records system, this request for production is intended to require the production of every possible data set (or categories of data) that your electronic medical record system can provide. In the event you claim that information in your possession is privileged or work product, provide a privilege log specifying the privileged items.

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## What to Ask for?

- **No. 2:** The print screen of Defendant's EMR computer system that provides the data sets that Defendant may select for printing of Plaintiff's medical records.

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## What to Ask for?

- **No. 3**: Any Room Activity Report, Detailed Room Activity Report, and/or any report documenting any visit by hospital personnel or health care providers to decedent/patient's room or that tracks the location and timing of decedent/patient in the hospital

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Doctor's Company: ehr are causing medical errors

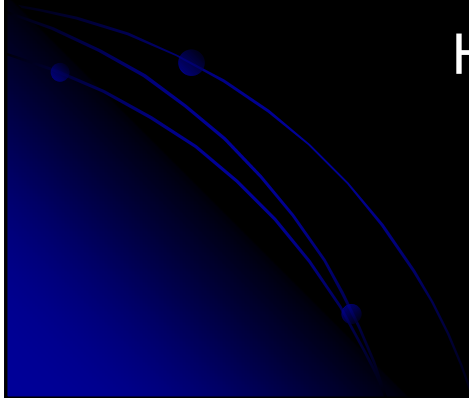
- **Analysis of EHR Contributing Factors in Medical Professional Liability Claims**
- **Lack of Physician training:** Not seeing available data, including radiology. GYN not seeing recent CT.
- **Alerts:** Failure of system to transmit data to caregivers, including critical value alerts

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Doctor's Company: ehr are causing medical errors

- **Analysis of EHR Contributing Factors in Medical Professional Liability Claims**
- **Data Entry:** wrong patient, wrong test, wrong data.

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What to Ask For

Meta Data

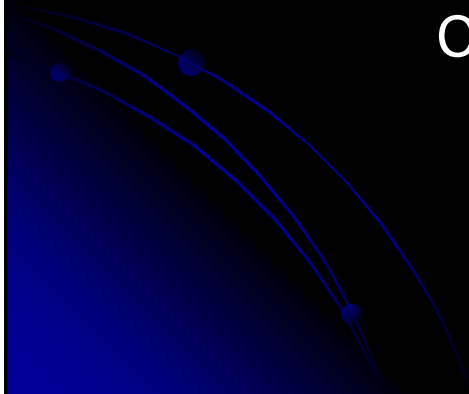
Inside The System

Outside The System

Hosted Locally

Cloud Based

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Each System is Unique

Data Dictionaries

Exports of Data

Reviewing Other Relevant Data – HIPAA  
Issues

Copy and Paste

Templates

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Manipulation

Back Charting

Changing Dates

New Data Entered Later

Editing of the Database

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## What to do / How to do it

- Meta Data is Everywhere
  - – it can tell a much different story than the data
- How do you know when to call for help?
  - - upfront a consultant can steer a case in the right direction
  - - data that looks suspicious

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## What to do / How to do it

- Are there things that should signal suspicion that data has been altered?
  - If it is too good to be true, it probably is.
- Can you do a quick review of data produced to advise on what deeper review is possible?
  - Yes

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## What to do / How to do it

- Do you have some practical tips for us in writing discovery requests?
  - Yes I have templates that can be used for all sorts of discovery requests

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