



# Bioinformatics and Security Technology in São Paulo and the US

NINA ALLI

H2HC - SÃO PAULO, BRASIL

# Medical Ecosystem

SPOT THE PATIENT?



Why is MedTech InfoSec so fucking hard?



# “HOPE” ISN'T A SECURITY STRATEGY



HOW DID WE GET TO THIS POINT: QUICK BACKGROUND

# Technologic Pillars of Care

## DEVICES

IMPLANTABLES

PATIENT MONITORS

LIFE SUPPORT SYSTEMS

SURGICAL TOOLS

IMAGING MACHINES

## INFRASTRUCTURE

ELECTRONIC MEDICAL RECORDS

LABORATORY ORDERS

TELEMEDICINE

PUBLIC HEALTH

POWER GRID

# Pain Points?

Latest Industry Issue:  
WannaCry

- ▶ Isolated Silos
- ▶ Operating Systems
- ▶ Servers

Still more to come:

What will be done with the remaining NSA leaked hacks?



**“Healthcare data represents the ‘holy grail’ in terms of data theft.”**



# Patient Identity Theft: PHI/PII what can they steal?

- ▶ Patient First, Middle, Last Names
- ▶ Address
- ▶ DoB
- ▶ SSN
- ▶ Telephone Number
- ▶ CC info
- ▶ Drivers License
- ▶ Passport Info
- ▶ Insurance
- ▶ Blood Type
- ▶ Allergies
- ▶ Medications
- ▶ Diagnoses
- ▶ Procedures
- ▶ Emergency Contact - name and phone number
- ▶ NOW INCLUDING!!!  
GENOMIC/DNA Data




# Dream Market and Alpha Bay


The screenshot shows a web browser window with a dark theme. The browser's address bar is empty, and the page title is not visible. The main content area displays a grid of listings. The central listing, titled "MEDICAL FULLZ (DOB, SSN, PHOTO, Insurance, Drugs)", is highlighted with a red border. It features a thumbnail image of a person in a balaclava holding documents, a price of \$0.99, and a seller named TuttiFrutti\_store with a 4.88 star rating and 50 reviews. Other listings include "5g Critical-Mass AAA+" for \$60.2, "1 GR BLONDE HASH SUPER POLM" for \$14.24, and "Track 1/2 atm cards with pin - Dumps with pin cont" for \$10. Each listing includes a thumbnail image, a price, a seller name with a star rating and review count, and an "Order" button. Some listings also have "ESCROW" or "NO ESCROW" labels. At the bottom, there is a pagination bar with page numbers 1 through 17, and a search bar with the number 7 entered.

Most Visited Learn more about Tor The Tor Blog


**MEDICAL FULLZ (DOB, SSN, PHOTO, Insurance, Drugs)**

 **\$0.99**  
TuttiFrutti\_store (50) (4.88★)  
WW → WW


**Track 1/2 atm cards with pin - Dumps with pin cont**

 **\$10**  
octopussi (36) (4.80★)  
WW → WW

**5g Critical-Mass AAA+**

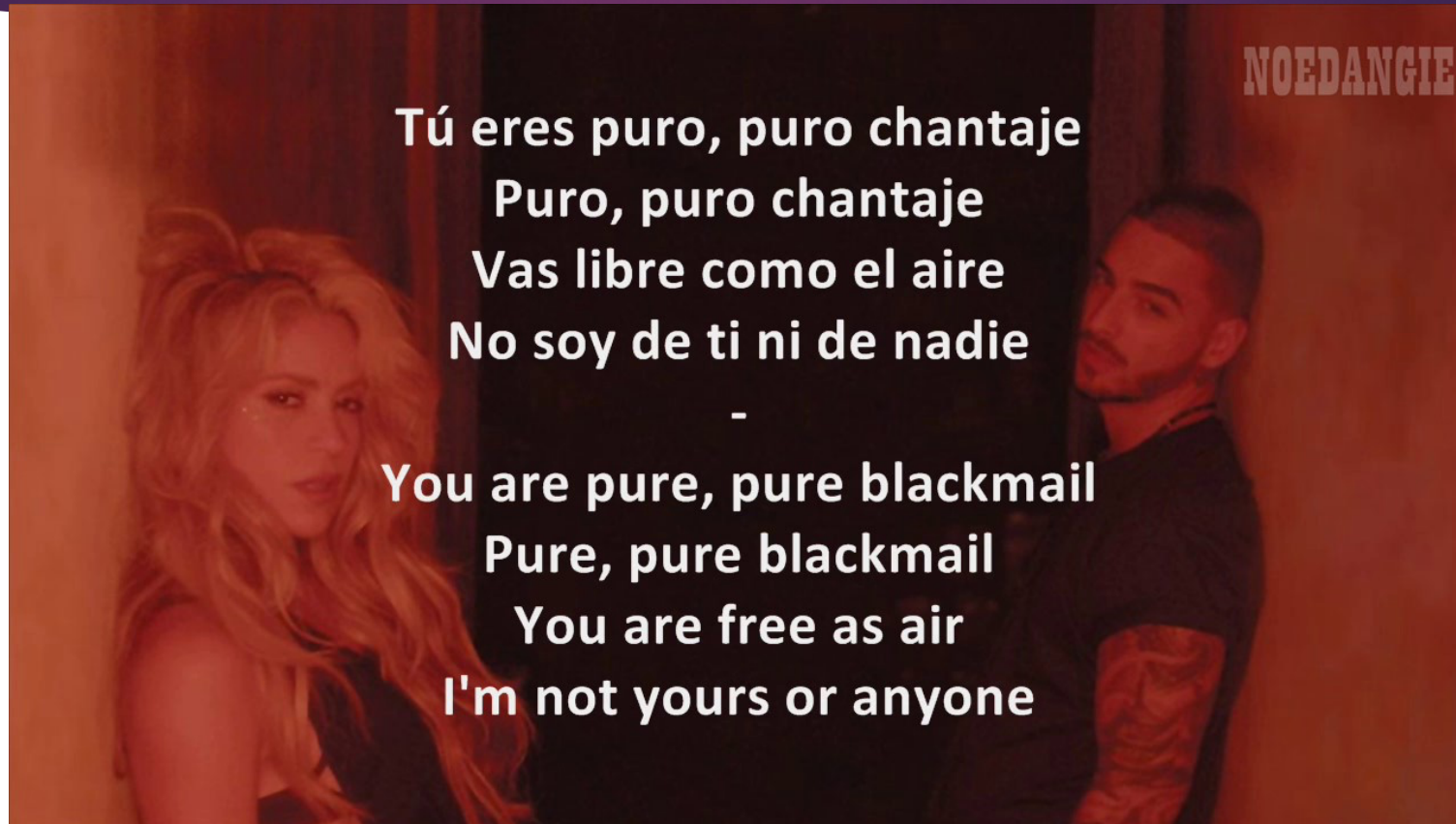
 **\$60.2**  
CLUBMEDIA (600) (4.93★)  
DE → EU

**1 GR BLONDE HASH SUPER POLM**

 **\$14.24**  
POWERSALES (13) (5.00★)  
DE → DE, EU

← 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 →  
18 19 20 21 22 ... 2640 2641 2642 2643 2644 2645 2646 2647 →

# What does this leave patient data open to?



Who wants this info and why do “THEY” care so much?



# COST OF BUSINESS OR ACTIVITIES OF DAILY LIVING

▶ \$ of ONE Medical Record:  
500 - 1000 USD vs 40 - 1000 LATAM

▶ \$ of ONE credit card:  
50-150 USD vs 2-5 LATAM

➤ \$ of Medical Database  
➤ 5000-10,000 USD

# Fun Attack Vectors

▶ EASY: LISTEN

▶ MEDIUM: LOOK

▶ COMPLEX: DO

# Medical Devices

## WIRELESS IMPLANTABLE MEDICAL DEVICES

Deep Brain  
Neurostimulators



Cochlear Implants



Cardiac Defibrillators/  
Pacemakers



Gastric  
Stimulators



Insulin Pumps



Foot Drop  
Implants



# Sharing Patient data



# internet Tender: Bitcoin



- ▶ Obfuscated funding
- ▶ Anonymity
- ▶ Non-traceable
- ▶ Quick turnover and release



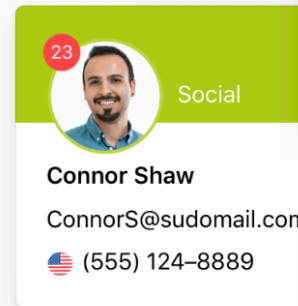
# Recent patient attack: Plastic surgery clinic says “we wont Pay”



# Hi, My name is . . .

Create special-purpose avatars for any situation.

Have up to 9 Sudo avatars for free. Each includes a custom phone number, email address, private browser and SudoPay virtual cards.



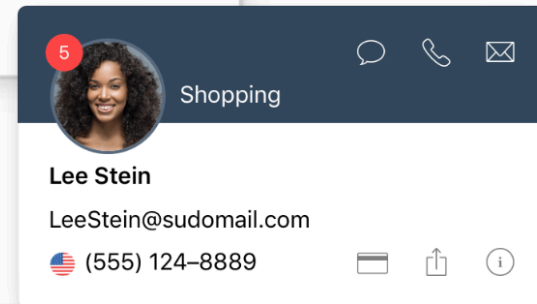
23  
Social

**Connor Shaw**  
ConnorS@sudomail.com  
🇺🇸 (555) 124-8889



13  
Calling

**Eileen Johnson**  
EileenJohnson@sudomail.com  
🇺🇸 (310) 124-8889



5  
Shopping

**Lee Stein**  
LeeStein@sudomail.com  
🇺🇸 (555) 124-8889



# Simple Guidelines to Better security

Assist doctors and hospitals in improving quality of care for patients

Publish transparent ratings on usability and security to transform information technology

Prevent information blocking

Enhance interoperability

Leverage health information technology to improve patient care

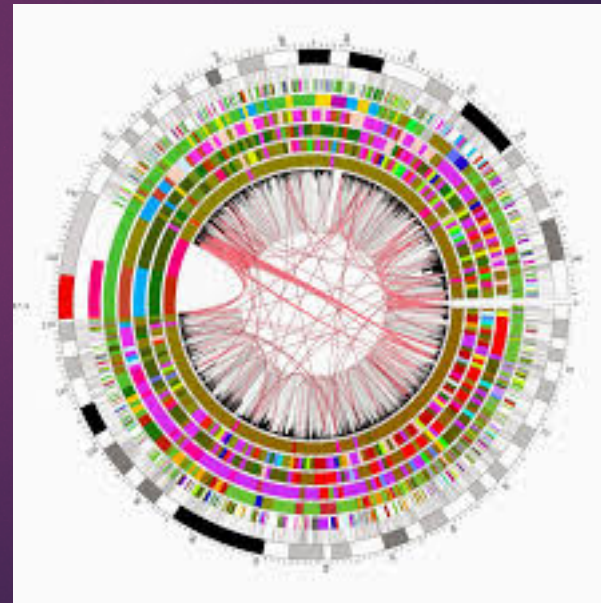
Empower patients and improving patient access to their electronic health information

Direct Govt Accountability Office to study patient matching



# AI in Healthcare

IBM WATSON, APPLE,





# Gene Editing (Insane in the Membrain)

FDA APPROVED!



# New Discoveries!

MISSING HIV COMPONENT FOUND

# Big Data

TO THE RESCUE?



# Paradigm Shift

BIOHACKING

# Politics

WHO KNEW MEDICINE WAS THIS HARD?

# Incident Response and Forensics

THE DOCTOR WILL SEE YOU NOW...



Where is all the security?



“What should I do?”



!!!HIRE A HACKER!!!  
!!!HIRE A HACKER!!!  
!!!HIRE A HACKER!!!

DEF CON

BIOHACKING



VILLAGE





# Ordem e Progresso

# Obrigada

NINA ALLI

@HEADINTHEBOOTH