ESCAPE:

Preparing healthcare professionals for cyberattacks

Puzzles for learners

Cybersecurity games

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Cybersecurity games	
Language	English

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1) Cybersecurity games

This puzzle consists of 3 mini-games related to different aspects you may face when it comes to cybersecurity. Every game has its own description.

2) Classification

Category	**Mark if applies**
Sector	☑ Healthcare
	☐ General
Topics covered	☑ Cybersecurity
	☑ Data protection
Situation type	☑ Prevention
	☑ Impact (i.e. when it is occurring or has occurred) on patient care.
	☐ Impact on all other activities not involving direct patient care.
Language of the original materials	☐ Dutch
	☑ English
	☐ German
	☐ Italian
	☐ Spanish
Type of the material	☑ Quiz questions
	☑ Games

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	☐ Applications & interactive videos
	☐ Checklists

3) Games

1) Cybersecurity Word Search for Pharmacy
   a) Look for the words in any direction: horizontal, vertical, and diagonal, from left to right or backwards. Mark or highlight the words when you find them.

List of words: Antivirus, Firewall, Phishing, Malware, Encryption, Password, Credentials, VPN, Backup, Two Factor, Patch, Update, Ransomware, Access, Data, Scam, Spyware, Link.

Ü	A	N	T	I	V	I	R	U	S	B	H	Á	Ñ	F
U	M	Q	S	Ó	Y	X	B	D	F	A	H	R	R	M
P	P	Á	C	Í	A	E	R	T	E	C	K	Ó	D	C
D	W	V	A	O	R	O	W	R	W	K	R	Í	Ú	C
A	D	F	M	A	W	O	A	S	K	U	W	Z	Ñ	R
T	O	G	W	S	F	W	K	R	Y	P	T	S	W	E
E	B	L	S	A	M	X	A	C	C	E	S	S	S	D
Ü	A	A	C	O	N	O	I	T	P	Y	R	C	N	E
M	P	T	S	Q	F	I	R	E	W	A	L	L	T	N
D	O	N	C	N	G	N	I	H	S	I	H	P	Z	T
R	A	Y	O	G	P	P	Ü	A	Ñ	P	Í	K	C	I
R	H	Ñ	É	Ü	C	V	H	E	A	K	B	A	O	A
S	P	Y	W	A	R	E	B	T	R	B	Ü	T	E	L
F	R	W	N	R	Ó	Ó	C	X	Á	Í	L	A	Y	S
K	N	I	L	N	Ó	H	M	É	I	R	Z	D	B	Ú

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Feedback: The solutions are the following:

*	A	N	T	I	V	I	R	U	S	B	*	*	*	*
U	*	*	S	*	*	*	*	D	*	A	*	*	*	*
P	*	*	C	*	*	E	R	T	E	C	*	*	*	*
D	*	*	A	*	R	O	W	R	*	K	*	*	*	C
A	*	*	M	A	W	O	A	*	*	U	*	*	*	R
T	*	*	W	S	F	W	*	*	*	P	*	*	*	E
E	*	L	S	A	M	*	A	C	C	E	S	S	*	D
*	A	A	C	O	N	O	I	T	P	Y	R	C	N	E
M	P	T	S	*	F	I	R	E	W	A	L	L	*	N
*	O	N	*	N	G	N	I	H	S	I	H	P	*	T
R	A	*	*	*	P	*	*	*	*	P	*	*	*	I
R	*	*	*	*	*	V	*	*	A	*	*	A	*	A
S	P	Y	W	A	R	E	*	T	*	*	*	T	*	L
*	*	*	*	*	*	*	C	*	*	*	*	A	*	S
K	N	I	L	*	*	H	*	*	*	*	*	D	*	*

2) Solve the following riddles:

Riddle: I am the rule that hides the patient's name, yet shows what they need when authorized. I never reveal too much, only what's allowed. What am I?

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Hint: A principle governing who can see health information.

Right answer: Privacy Rule.

Feedback: Privacy rules is a regulatory standard that limits the use and disclosure of protected health information (PHI) to the minimum necessary to accomplish the intended purpose, while preserving the right of individuals to access and request amendments to their health records.

Riddle: I travel with every chart and every file, ensuring access is granted only to those with a key. When I'm strong, data stays secure; when I'm weak, it's a door left ajar. What am I?

Hint: A security mechanism for controlling who reads data.

Right answer: Access control.

Feedback: Access control is a set of mechanisms and policies that restrict system access to authorized users, programs, or entities, ensuring that only permitted individuals can read, modify, or transmit confidential data, based on verified credentials and defined permissions.

Riddle: I am the shield between a patient's memory and the world, turning raw data into a story that only the right hands can read. What am I?

Hint: I transform data into understandable, but protected, information.

Right answer: De-identification (and sometimes pseudonymization)

Feedback: De-identification is a procedural and technical process of removing or obfuscating identifying information from data sets such that the risk of re-identification is minimized to an acceptable level, thereby enabling secondary use without compromising patient privacy.

Riddle: I am the promise that even when data must leave a hospital, it wears a cloak so that the patient's identity cannot be easily traced. What am I?

Hint: A process used when sharing data for research or collaboration.

Right answer: Anonymization (or pseudonymization, depending on method)

Feedback: Anonymization is the irreversible process of erasing or transforming identifiers to prevent re-identification of individuals in any data set; pseudonymization replaces identifiers with pseudonyms while allowing certain linkages under controlled conditions, preserving data utility under safeguards.

Riddle: I am the quiet rule that tells you to speak softly: say what you must, never what you shouldn't, and always verify who is listening. I guide every keystroke and every whispered exchange. What am I?

Hint: A discipline of careful, compliant communication in healthcare.

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Right answer: Confidentiality (or data confidentiality).

Feedback: Confidentiality is a fundamental principle of information governance requiring that PHI be protected from unauthorized access or disclosure, ensuring that information is only accessible to individuals who are explicitly authorized and who have a legitimate need to know, through organizational controls and legal obligations.

3) Here is a set of definitions to develop a “The alphabet game” with students:

A: Abstraction: The process of hiding details to focus on essential features of data, often used to protect identity.

B: Breach: An incident where protected health information is accessed or disclosed without authorization.

C: Confidentiality: The principle of keeping patient information private and secure.

D: De-identification: Removing or masking identifying information to prevent patient re-identification.

E: Encryption: Transforming data into a coded form to protect confidentiality during storage or transmission.

F: Firewall: A security system that monitors and controls incoming and outgoing network traffic.

G: Geolocation minimization: Reducing or masking location data to protect patient privacy.

H: Hacker-awareness: Training and practices to recognize and respond to unauthorized data access attempts.

I: Identifier: Any data that can uniquely identify an individual within a dataset.

J: Justification: The documented reason required to access or disclose patient information.

K: Key management: The processes for generating, storing, and handling cryptographic keys.

L: Least privilege: Giving users the minimum access necessary to perform their duties.

M: Masking: Replacing sensitive data with non-identifying characters or tokens.

N: Notice: The requirement to inform patients about how their data is used and shared.

O: Opt-out: A patient's right to decline certain data sharing or processing.

P: Pseudonymization: Replacing identifiers with pseudonyms to reduce identifiability.

Q: Quarantine: Segregating data or systems suspected of compromise to prevent spread.

R: Records governance: Policies and procedures for managing health records securely.

S: Stored-procedure access: Controlling who can run database routines that handle sensitive data.

T: Trauma-informed privacy: Integrating privacy protections with care practices sensitive to patient experiences.

U: User authentication: Verifying a user’s identity before granting access.

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V: Versioning control: Tracking changes to data to maintain integrity and accountability.

W: Watermarking: Marking data with an identifying mark to deter misuse.

X: eXfiltration prevention: Measures to prevent unauthorized data leaving a network.

Y: You-anonymize: The practice of removing identifiers to protect privacy.

Z: Zero-knowledge: A cryptographic method enabling verification without revealing data.

4) More information

These questions have been inspired and adapted to the healthcare sector by the scenarios presented by INCIBE in the following web https://www.incibe.es/menores/juegos/juegos-didacticos. This material is published in Spanish, as INCIBE is a Spanish institution.

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