

# Evidencia de la necesidad de tecnología para un PROA exitoso

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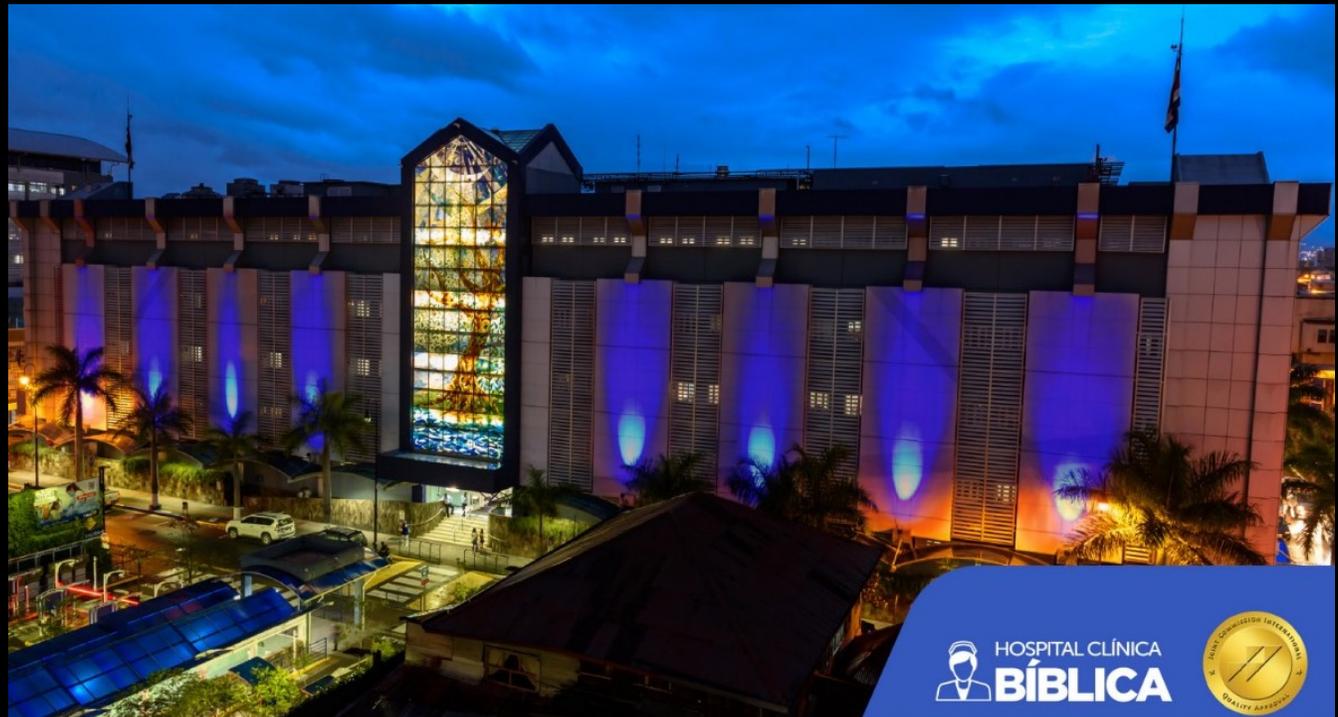
# Disclaimer

- No soy experto en informática y menos en inteligencia artificial.
- No tengo afiliación alguna con ninguna de las compañías de tecnología mencionadas durante esta presentación.

# Agradecimiento

- Oportunidad de participar
- Día 2:
  - 14 sesiones
  - 6 (43%) a cargo o incluyen farmacéuticos
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CONFERENCISTA
Dr. Gabriel Levy (Argentina).
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QF. José Pablo Díaz (Costa Rica).
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# Inteligencia Artificial

La habilidad de una computadora de hacer tareas que son usualmente realizadas por humanos

# IDWeek 2023



**Save the Date**  
Oct. 11-15, 2023  
Boston, Massachusetts

Session: Opening Plenary

## 27 - AI and the Future of ID

📅 Wednesday, October 11, 2023 ⌚ 4:35 PM – 5:00 PM US ET 📍 Location: Ballroom (Third Floor)

### Plenary Speaker(s)



**Isaac Kohane, MD, PhD**

Chair of the Department  
Harvard Medical School  
Boston, MA, United States

### Disclosure(s):

Isaac Kohane, MD, PhD: No financial relationships to disclose



# 2023 Business Meeting and Lecture Series

## October 10th, 2023

2:45 - 3:45 PM

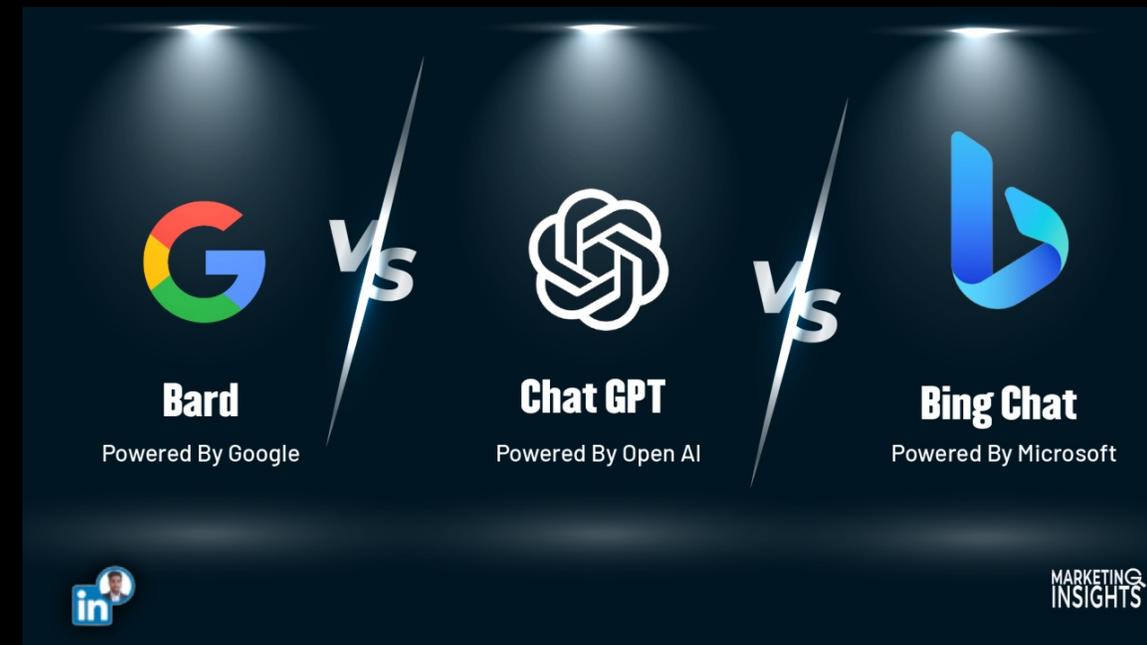
### Educational Session

#### The wAlt is over: Artificial Intelligence Applications in Antimicrobial Stewardship

*Whitney Buckel, PharmD, BCIDP*  
*Helen Newland, PharmD, BCPS, BCIDP*

# Large Language Models (LLMs)

- Tipo de inteligencia artificial
- Algoritmo entrenado con una amplia gama de datos y que puede generar texto que es relevante y coherente.
- Necesitan entrenamiento y ajustes
  - Pueden ser entrenados en literatura médica.
- Alucinaciones
- Pueden ser optimizados



+ New chat

- Recent
- Technology's role in antimicrob...
  - Technology in antimicrobial ste...
  - Translate the next paragraph to ...

What is the evidence of the need for technology for a successful antimicrobial stewardship program?

There is growing evidence of the need for technology to support successful antimicrobial stewardship (AMS) programs. AMS programs are designed to improve the appropriate use of antimicrobials, improve patient outcomes, and reduce the emergence and spread of antimicrobial resistance (AMR). Technology can play a vital role in AMS programs by helping to:

- **Improve data collection and analysis.** Technology can be used to collect and analyze data on antimicrobial prescribing and use, as well as patient outcomes and infection rates. This data can be used to identify areas for improvement, track progress over time, and evaluate the impact of AMS interventions.
- **Provide real-time clinical decision support.** Technology can be used to provide clinicians with real-time guidance on the appropriate use of antimicrobials, based on the latest evidence and patient-specific factors. This can help to reduce the risk of inappropriate prescribing and improve patient care.
- **Facilitate communication and collaboration.** Technology can be used to facilitate communication and collaboration between AMS team members, clinicians, and other stakeholders. This can help to ensure that AMS interventions are implemented effectively and that patients receive the best possible care.

Here are some specific examples of how technology is being used in AMS programs:

- **Electronic health records (EHRs)** can be used to track antimicrobial prescribing and use, identify patients at high risk for inappropriate prescribing, and provide clinicians with real-time clinical decision support.
- **Antimicrobial stewardship software** can be used to collect and analyze data on antimicrobial prescribing and use, identify areas for improvement, and track progress over time.
- **Mobile apps** can be used to provide clinicians with real-time guidance on the appropriate use of antimicrobials, as well as to facilitate communication and collaboration between AMS team members and clinicians.

Evidence suggests that the use of technology can improve the effectiveness of AMS programs. For example, a study published in the journal *Infection*

Enter a prompt here



Could you provide evidence that technology can help Antimicrobial Stewardship Programs in hospitals without electronic medical records?



Certainly, even in hospitals without electronic medical records (EMRs), technology can still play a crucial role in supporting Antimicrobial Stewardship Programs (ASPs). Here are some examples of how technology can be applied:



**1. Paper-Based Tools with Decision Support:**

- **Example:** Hospitals can implement paper-based decision support tools or checklists that offer guidance on appropriate antibiotic selection, dosing, and duration. These tools can be developed based on local antibiograms and clinical guidelines.

**2. Stand-Alone Clinical Decision Support Systems (CDSS):**

- **Example:** Even without a comprehensive EMR, hospitals can invest in stand-alone CDSS software that provides recommendations for antibiotic prescribing. These systems can be integrated into existing workflows.

**3. Surveillance Systems with Manual Data Entry:**

- **Example:** Hospitals can utilize specialized software for surveillance of antimicrobial use and resistance. Although data entry may be manual, the system can still facilitate monitoring and reporting of key metrics.

**4. Pharmacy Management Systems:**

- **Example:** Hospitals can implement pharmacy management systems that include functionalities for tracking and managing antimicrobial inventory. These systems

Regenerate

Send a message



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What is the evidence of the need for technology for a successful antimicrobial stewardship program?  
Please be very specific and provide examples.

SEARCH CHAT



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✓ Searching for: **technology in antimicrobial stewardship program**

✓ Generating answers for you...

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There is increasing evidence that technology can significantly enhance the impact of Antimicrobial Stewardship Programs (ASPs). Here are some specific examples:

- 1. Electronic Medical Record (EMR) Upgrades and Clinical Decision Support Tools:** These can enhance existing stewardship functions such as audit and feedback, de-escalation, and "time-outs" among others <sup>1</sup>. They can also help guide appropriate antimicrobial prescribing that improves selection, dosing, and duration of therapy <sup>2</sup>.
- 2. Antimicrobial Utilization and Resistance Data Reporting:** This enables a deeper understanding of local trends in the context of benchmarked national data <sup>1</sup>.
- 3. User-friendly Smartphone Apps:** These are prescriber-oriented platforms which house stewardship guidelines, antibiograms, and other information which can potentially reach thousands of prescribers <sup>1</sup>.
- 4. Social Media Platforms:** Harnessing social media platforms can increase the visibility of stewardship and infection prevention research <sup>1</sup>.

9:02

← ⌚ Untitled chat ...



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## Using Technology to Enhance Antimicrobial Stewardship Impact in the Acute Care Setting

[Kelsie Cowman MPH](#), [Victor Chen PharmD, BCPS, BCIDP](#), [Yi Guo PharmD, BCIDP](#) & [Priya Nori MD](#) 

[Current Treatment Options in Infectious Diseases](#) 12, 145–157 (2020) | [Cite this article](#)

353 Accesses | 5 Citations | [Metrics](#)

### Abstract

#### Purpose of Review

There are numerous opportunities for antimicrobial stewardship programs (ASPs) to utilize technology to maximize their impact on patient care. Herein we describe different technology platforms, strengths and limitations of each, and provide some examples of their use in clinical settings.

#### Recent Findings



### Infection Control & Hospital Epidemiology

#### Article contents

[Abstract](#)

[Regulatory and accreditation standards driving change](#)

[Connecting with pay for performance and](#)

## The role of electronic health record and “add-on” clinical decision support systems to enhance antimicrobial stewardship programs

Published online by Cambridge University Press: 25 April 2019

[Kristi M. Kuper](#) , [Jerod L. Nagel](#) , [Jarrod W. Kile](#), [Larissa S. May](#) and [Francesca M. Lee](#)

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### Abstract

Increasingly, demands are placed on healthcare systems to meet antimicrobial stewardship standards and reporting requirements. This trend, combined with reduced financial and personnel resources, has created a need to adopt information technology (IT) to help ease these burdens and facilitate action. The incorporation of IT into an antimicrobial stewardship program can help improve stewardship intervention efficiencies and facilitate the tracking and

# Evidencia de la necesidad de tecnología para un PROA exitoso

- La tecnología puede jugar un papel vital en los PROAs al:
  - Mejorar la recolección de datos y el análisis.
  - Proveer de información en tiempo real para la toma de decisiones clínicas.
  - Facilitar la comunicación y colaboración.
- Importante\*:
  - Podemos hacer PROA con poca tecnología.

# Evidencia de la necesidad de tecnología para un PROA exitoso

- Herramientas:
  - Expedientes médicos digitales (Electronic Medical Records: EMR)
  - Clinical Decision support systems (CDSS)
  - Aplicaciones para celular
  - Softwares para manejo de datos
  - Redes Sociales

## Collaborative Antimicrobial Stewardship

### Working with Information Technology

Kristi M. Kuper, PharmD, BCPS<sup>a</sup>, Keith W. Hamilton, MD<sup>b,\*</sup>

#### KEYWORDS

- Antimicrobial stewardship • Technology • Informatics • Metrics
- Electronic health records • Clinical decision support systems

#### KEY POINTS

- Integration of information technology in antimicrobial stewardship programs can improve efficiency and help to scale antimicrobial stewardship interventions.
- Information technology can facilitate administrative tasks of antibiotic stewardship programs, including tracking and reporting antibiotic use data and other metrics.
- Information technology can provide guidance to prescribers at the point of care using clinical decision support and predictive analytics.

## • PROA + Tecnologías de información (TI):

- Mejorar eficiencia
- Ayudar a escalar el PROA
- Facilitar tareas administrativas como el seguimiento y el reporte de datos de uso de antibióticos, entre otras métricas.
- Proveer guía a los prescriptores en el sitio de atención usando sistemas de soporte en la toma de decisiones y análisis predictivos.

# Importante

Modelo Profesional de la salud

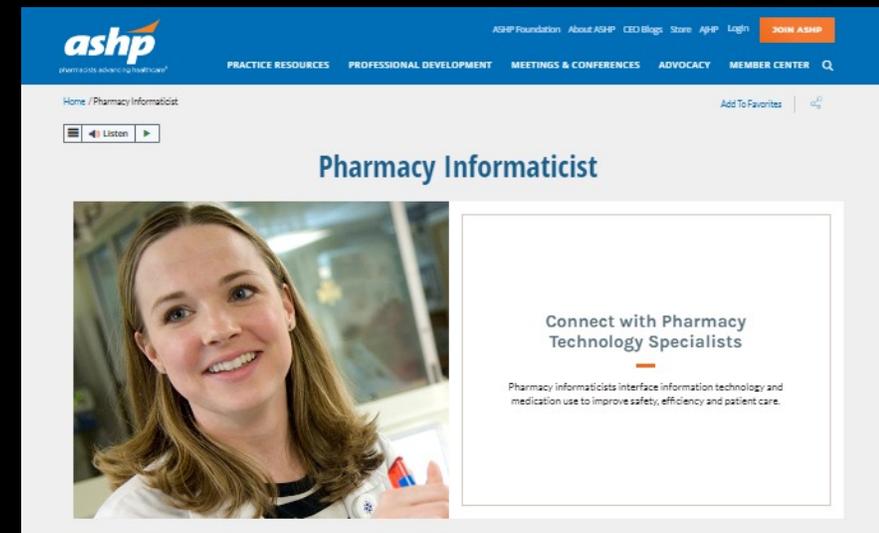
+

Profesional de TI

Modelo profesional de la salud entrenado en TI

+

Profesional de TI con conocimientos de salud



# 1. Expediente Médico Electrónico (EMR)

- Un registro electrónico longitudinal de información de salud del paciente generado por 1 o más encuentros en cualquier entorno de prestación de atención.
  - EPIC
  - TrakCare
- Necesitamos EMR inteligentes. No es tener en digital lo que teníamos en papel

# EMR- Utilidad para los PROA:

Seguimiento de intervenciones.

Alertas de verificación de dosis.

Tiempos de administración de antimicrobianos.

Monitoreo intravenoso a oral

Recordatorios diarios a médicos para la evaluación de indicación y fecha de finalización.

- - en el 96% de los casos se registró una indicación y fecha de finalización.

Exceso de alertas puede causar desensibilización.  
**(Alert fatigue)**

# Machine Learning

- Una rama de inteligencia artificial y ciencias de la computación que se concentra en el uso de datos y algoritmos para imitar la manera en que los humanos aprenden, gradualmente mejorando su exactitud.
- Implica entrenar sistemas informáticos para aprender y mejorar sin ser programados explícitamente.
  - Ejemplos en la vida diaria:
    - Reconocimiento facial
    - Detección de fraudes bancarios
    - Traductores
    - Motores de recomendaciones (ej. recomendaciones de productos)
    - Feed de redes sociales
    - Texto predictivo

## 2. Clinical Decision Support Systems (CDSS)

- Sistemas de apoyo a las decisiones clínicas.
- Generan alertas y reportes en tiempo real para ayudar a los PROA a identificar pacientes que requieren ser intervenidos.
- Los más comunes:
  - Theradoc [Premier].
  - Senti7 [Wolters Kluwer].

CDSS	Vendor	Key Features
SafetySurveillor	Premier, Charlotte, NC	Can be used to generate antibiograms: specific to user-designed time frames and units Integrated stewardship and infection control module Customizable work lists by user Includes access to training modules, cost justification letters, and so forth
TheraDoc Antibiotic Assistant	Hospira, Lake Forest, IL	Antibiotic Assistant: Tool for evidence-based recommendations Can be customized by individual user Integrated ability to track trends and document interventions Pager/e-mail alerts Creates antibiograms: unit, source, and time frame specific Data stored in on-site server
QC Pathfinder	Vecna, Cambridge, MA	Pharmacy and infection control component Pager/e-mail alerts Includes preprogrammed customizable alerts Customizable, real-time antibiograms Can store data on remote or on-site server
MedMined Surveillance Advisor	CareFusion, San Diego, CA	MedMined modules: Virtual surveillance infection: supports infection control activities Generates antibiograms Customizable alerts by user Evidence-based alerts preprogrammed E-mail alerts to users Clinical experts support team
Senti7	Pharmacy OneSource, Bellevue, WA	Supports infection control and stewardship Relies on user-specific reports Creates institution-specific, annual antibiograms Started as tool for notating pharmacy interventions

Kullar R, Goff DA. Transformation of Antimicrobial Stewardship Programs Through Technology and Informatics. Infectious Disease Clinics of North America [Internet]. 2014 Jun [cited 2023 Oct 3];28(2):291–300. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0891552014000130>

Bremmer DN, Trienski TL, Walsh TL, Moffa MA. Role of Technology in Antimicrobial Stewardship. Medical Clinics of North America [Internet]. 2018 Sep [cited 2023 Oct 3];102(5):955–63. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0025712518300452>

# CDSS- Posibles alertas:

Pacientes con cultivos sanguíneos positivos.

Pacientes con resultados de pruebas diagnósticas rápidas.

Pacientes a quienes se les ha prescrito un antimicrobiano específico.

Pacientes con cultivos para un microorganismo específico.

- *Staphylococcus aureus*.
- *Pseudomonas aeruginosa*.

Pacientes que han estado en tratamiento con antimicrobianos durante períodos de tiempo definidos.

Pacientes que son candidatos para la conversión de tratamiento intravenoso a oral.

Pacientes con función renal disminuida.

Pacientes con una posible incompatibilidad entre el medicamento y el microorganismo que podrían estar recibiendo un tratamiento inapropiado.

# CDSS- Impacto:

- Varios estudios han demostrado que los CDSS aumentan el número de intervenciones de los PROA.
- Senti7 generó un aumento del 87% del número de intervenciones.
- La implementación de TheraDoc se asoció a mejoras en la selección de un tratamiento antimicrobiano apropiado.
- Las tarifas iniciales y anuales de suscripción de los CDSS pueden resultar costosas para una institución, oscilando entre \$100,000 y \$500,000 anualmente.
- Se necesita apoyo de IT para el desarrollo y la implementación de CDSS

# Eficiencia en Auditoría Prospectiva y retroalimentación

*Open Forum Infectious Diseases*

MAJOR ARTICLE

 **IDSA**  
Infectious Diseases Society of America

 **hivma**  
hiv medicine association

 **OXFORD**

## Real-world Antimicrobial Stewardship Experience in a Large Academic Medical Center: Using Statistical and Machine Learning Approaches to Identify Intervention “Hotspots” in an Antibiotic Audit and Feedback Program

**Katherine E. Goodman,<sup>1</sup> Emily L. Heil,<sup>2</sup> Kimberly C. Claeys,<sup>2</sup> Mary Banoub,<sup>3</sup> and Jacqueline T. Bork<sup>4</sup>**

<sup>1</sup>Department of Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore, Maryland, USA, <sup>2</sup>Department of Pharmacy Practice and Science, University of Maryland School of Pharmacy, Baltimore, Maryland, USA, <sup>3</sup>Department of Pharmacy, University of Maryland Medical Center, Baltimore, Maryland, USA, and <sup>4</sup>Department of Medicine, University of Maryland School of Medicine, Baltimore, Maryland, USA

- Estudio transversal retrospectivo de órdenes de antibióticos que fueron revisadas para posible auditoria prospectiva con retroalimentación.
  - Estudio buscaba identificar predictores de intervenciones por PROA.

# Eficiencia en Auditoría Prospectiva y retroalimentación

- 17503 revisiones (Jul 17- Dec 19) de las cuales 4219 (24%) resultaron en intervención.
- Estimación a partir de modelo basado en machine learning reduciría la cantidad de revisiones en un 49% con una sensibilidad de 78%.

# Otros ejemplos de uso IA

- Diagnóstico:
  - Probabilidad de sepsis.
- Resistencia:
  - Antibiogramas específicos para el paciente.
- Toxicidad:
  - Daño renal agudo asociado a vancomicina.
  - Aparición de infección por *C. difficile*.
- Tratamiento:
  - Uso de antibióticos asociados al riesgo.

# Aplicaciones móviles

- Fácil acceso.
- Información médica ampliamente disponible.
- Los dispositivos móviles mejoran la toma de **decisiones clínicas** y aumentan la **eficiencia** en las prácticas laborales.
  - Encuesta 2014- Epócrates: el 80% de los médicos utilizan sus dispositivos móviles en su trabajo profesional.



# Review of Infectious Diseases Applications for iPhone/iPad and Android: From Pocket to Patient

**Amaran Moodley,<sup>1</sup> Julie E. Mangino,<sup>2,3</sup> and Debra A. Goff<sup>4</sup>**

<sup>1</sup>Division of Infectious Diseases, Department of Pediatrics, Blank Children's Hospital, Des Moines, Iowa; <sup>2</sup>Division of Infectious Diseases, Department of Internal Medicine, The Ohio State University; <sup>3</sup>Department of Clinical Epidemiology, The Ohio State University Wexner Medical Center and <sup>4</sup>Department of Pharmacy, The Ohio State University Wexner Medical Center, Columbus

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**The explosion of medical applications (apps) in the Apple and Google Play app stores has made it increasingly difficult to find relevant and reliable infectious diseases (ID) apps. Apple created a section called “Apps for Healthcare Professionals”; however, several ID apps are missing. Google Play’s ID category has several non-ID apps. Many apps involve diagnosis and patient management, creating a need for regulations and oversight by the US Food and Drug Administration. There are no standards to guide accuracy or reliability of medical apps’ content. We searched Apple and Google Play app stores to identify new ID apps. Over 1200 apps were identified. We applied several exclusion criteria to identify adult/pediatric apps with data from trustworthy sources that were not reviewed within the last year. Twelve new ID apps were identified with a comprehensive list of 24 ID apps to assist healthcare professionals at the point of care.**

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# Aplicaciones Móviles (Apps)

Revisión 2013



Available on the  
**App Store**



GET IT ON  
**Google Play**

+1200 ID Apps

24 detectadas

- Confiables.
- Fácil de utilizar.
- Inglés.
- Relevantes.

**Table 1. Overview of Applications**

Category	Android Phone	Apple iPhone/iPad	Cost (US \$)	Updates (last or frequency)	Wi-Fi iOS	General Description	References Provided
<b>Pediatric</b>							
AAP Red Book	Yes	Both	124.99	June 2013 ongoing	No 4.3	Comprehensive epidemiology, presentation, diagnosis, and treatment of >200 childhood infections	No
Nelsons Pediatric Antimicrobial Therapy	Yes	Both	29.99	December 2012	No 4.3	Preferred, evidence-based therapies for pediatric clinical syndromes and specific pathogens	Yes
Infectious Diseases in Children	No	iPhone	Free	Daily	Yes 5.0	News feed that provides daily updates on hot topics in pediatrics and infectious diseases	Yes
CDC Vaccine Schedule for Adults and Children	No	iPhone	4.99	February 2013 Yearly	No 5.0	Pediatric and adult vaccination schedules, catch-up schedules, and vaccine contraindications	Yes
SHOTS STFM 2012	Yes	iPhone	Free	August 2012	No 4.0	Child, adolescent, and adult vaccination recommendations in easy color-coded charts	Yes
<b>Infection Prevention/Control</b>							
Infection Control Pocketbook	No	iPhone	Free	May 2012	No 4.0	Disease and pathogen-specific isolation precautions adapted from CDC guidelines	Yes
iScrublite <sup>a</sup>	No	iPhone	Free	May 2010	No 3.0	Healthcare providers can record hand hygiene observations. Easy to use.	No
<b>Antimicrobial reference</b>							
Lexi-Drugs <sup>a</sup>	Yes	iPhone	75.00/year	Weekly	Yes 4.3	Comprehensive drug database with international brands, new FDA warnings. Works on only 1 device.	Yes
Sanford Guide to Abx <sup>a</sup>	Yes	Both	29.99/year	Ongoing	No 5.1	Clinical conditions and anti-infective drug information. Can install content on 3 devices.	Yes
2013 EMRA Antibiotic Guide <sup>a</sup>	Yes	Both	15.99	6 mo	No 5.0	Targeted to emergency medicine physicians. Complete antibiotic dosing guide and general information.	No
Epocrates Rx <sup>a</sup>	Yes	Both	Free	Weekly	No 4.3	Easy to navigate drug information and drug interactions. John Bartlett, MD, provides up-to-date scientific news and reviews abstracts.	Yes
Johns Hopkins Abx Guide <sup>a</sup>	Yes	Both	29.99/year	Ongoing	No 4.3	Comprehensive easy to use antimicrobial guide. Allows voice search on iPhone 4S/5 and iPad 3	Yes
Micromedex Drug Information <sup>a</sup>	Yes	Both	Free	As needed	No 3.0	Useful resource on over 4500 drugs including off-label indications	Yes
<b>Clinical References</b>							
Uptodate <sup>a</sup>	Yes	Both	499.00 1 y	Monthly	Yes 5.0	Provides evidenced-based recommendations of current clinical information for adults and kids	Yes
Medscape <sup>a</sup>	Yes	Both	Free	Every few months	No 5.0	From WebMD, features drug information, diseases, calculators, and free CME and ACPE credit. Easy to navigate	Yes
Infectious Disease Compendium <sup>a</sup>	Yes	Both	5.99 1.29 -android	December 2012	Yes 5.0	Over 600 pages on antibiotics, organisms and disease. Popular and easy to navigate.	Yes
Sepsis Guide	Yes	iPhone	Free	April 2012	No 4.3	Surviving sepsis campaign guideline and checklist with detailed references for each recommendation and links to websites. Limited antibiotic data.	Yes

*Table 1 continued.*

Category	Android Phone	Apple iPhone/iPad	Cost (US \$)	Updates (last or frequency)	Wi-Fi iOS	General Description	References Provided
CDC Yellow Book 2012	No	Both	9.99	2013	No 5.0	Detailed travel information on vaccinations, chemoprophylaxis epidemiology, diagnosis and treatment. 2012 version unavailable, new version to be released	Yes
FluView—CDC	No	iPhone	Free	Weekly	Yes 4.0	An interactive color-coded map of the US and flu data. Click on state to link to up-to-date flu prevalence from specific state's health department.	Yes
CDC Influenza (Flu)	No	Both	Free	Weekly	Yes 4.0	Comprehensive up-to-date influenza app with detailed information on flu activity, vaccines, diagnostics and treatment.	Yes
ACP Immunization Advisor	No	Both	Free	February 2013 Yearly	No 4.3	Adult vaccine information on generic/brand names, indications, contraindications, administration, side effects and storage/handling.	Yes
ID Podcasts USF <sup>a</sup>	Yes	Both	Free	Weekly	No 5.0	Podcasts from Univ. S. Florida Division of Infectious Diseases weekly case conferences. Over 100 hours of ID topics streamed over Wi-Fi/3G/4G.	No
Management of Candidemia in Stewardship Era	No	Both	Free	Quarterly	Yes 5.0	Provides 6 categories to help clinicians manage patients with candidemia. Stewardship concepts are included.	Yes
Healthmap: Outbreaks Near Me <sup>a</sup>	Yes	Both	Free	Real time	Yes 4.3	Provides real-time disease outbreak information. Integrates data ranging from news sources, personal accounts, and CDC.	No

Abbreviations: 3G/4G, third-generation/fourth-generation mobile communication technology standards; ACPE, Accreditation Council for Pharmacy Education; CDC, Centers For Disease Control and Prevention; CME, continuing medical education; FDA, Food and Drug Administration; ID, infectious diseases; OS: operating system; Wi-Fi, wireless Internet.

<sup>a</sup> These apps have been previously reviewed in detail [11, 12].

# Aplicaciones Móviles (Apps)

- Desarrollo de Apps institucionales para incorporar **Guías** para la prescripción de antimicrobianos.



En un estudio británico, las guías de bolsillo fueron reemplazadas por una aplicación para teléfonos inteligentes.

- La aplicación se utilizó mucho más que la guía de bolsillo.
- Se cuestionó con mayor frecuencia **la prescripción inapropiada** por parte de colegas.
- Los usuarios de la App eran más conscientes de la importancia de la administración de antimicrobianos.



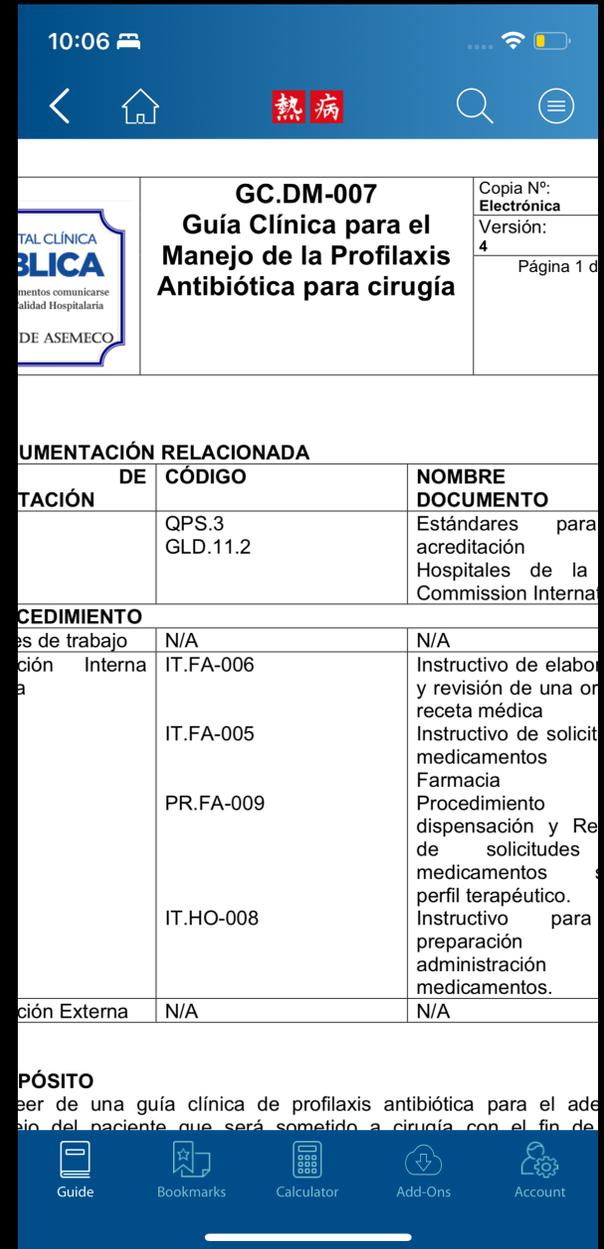
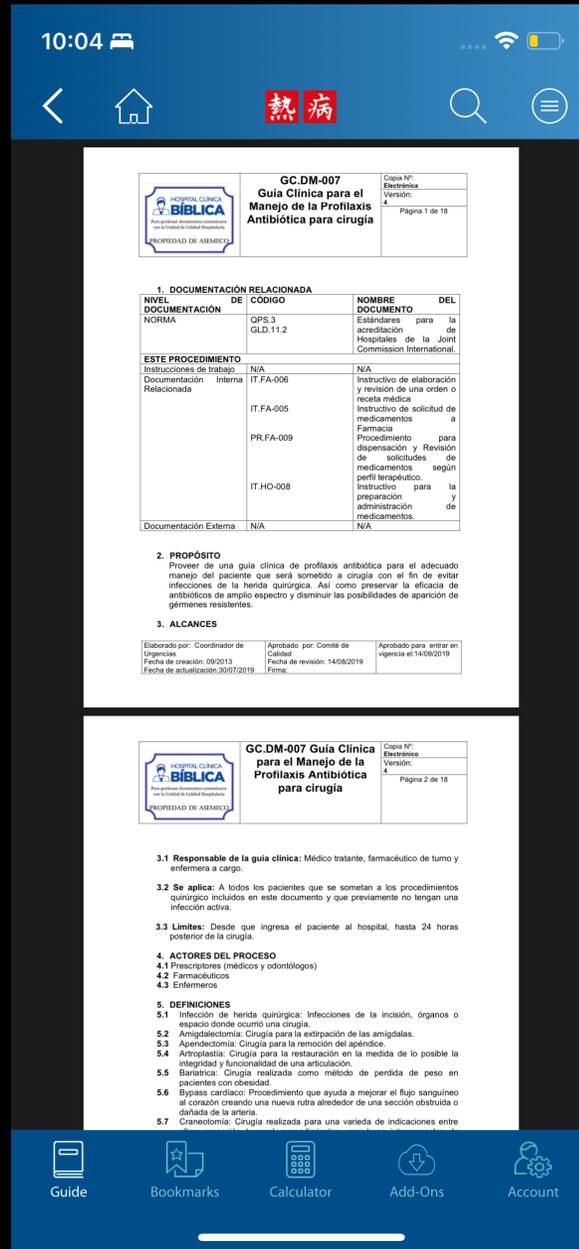
En Brasil, en un estudio observacional se vinculó la implementación de un app con la **disminución del consumo promedio mensual** de piperacilina-tazobactam y meropenem.

- Los perfiles de susceptibilidad de meropenem y polimixina mejoraron.
- Ahorros netos de casi **\$300,000** durante los 12 meses posteriores a la implementación de la App.

# Aplicaciones Móviles (Apps)

- Desarrollo de Apps institucionales para incorporar **Guías** para la prescripción de antimicrobianos.

Otro estudio observo un aumento en el cumplimiento de las políticas de prescripción de antimicrobianos en la especialidad de cirugía al implementar una app con la guía de prescripción.





# Softwares

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- User Guide
- Micromedex Compendia Resources
- Citing Micromedex

### Resources

- Do Not Crush Drugs List
- Extravasation
- Drug Classes
- Drug Consults
- Black Box Warnings
- Dosage and Class Comparison Tables
- REMS

Feedback

- Home
- Drug Interactions
- IV Compatibility
- Drug ID
- Drug Comparison
- Tox & Drug Product Lookup
- Calculators

Search Drug, Disease, Toxicology, and more

- All
- Drug
- Disease
- Toxicology

Keyword search

### Latest News

- Content Update Highlights
- Pharmaceutical Knowledge Updates

### Support & Training

- Training Center
- User Guide
- Micromedex Compendia Resources
- Citing Micromedex

**Micromedex Assistant** ✕

Meropen... Clear

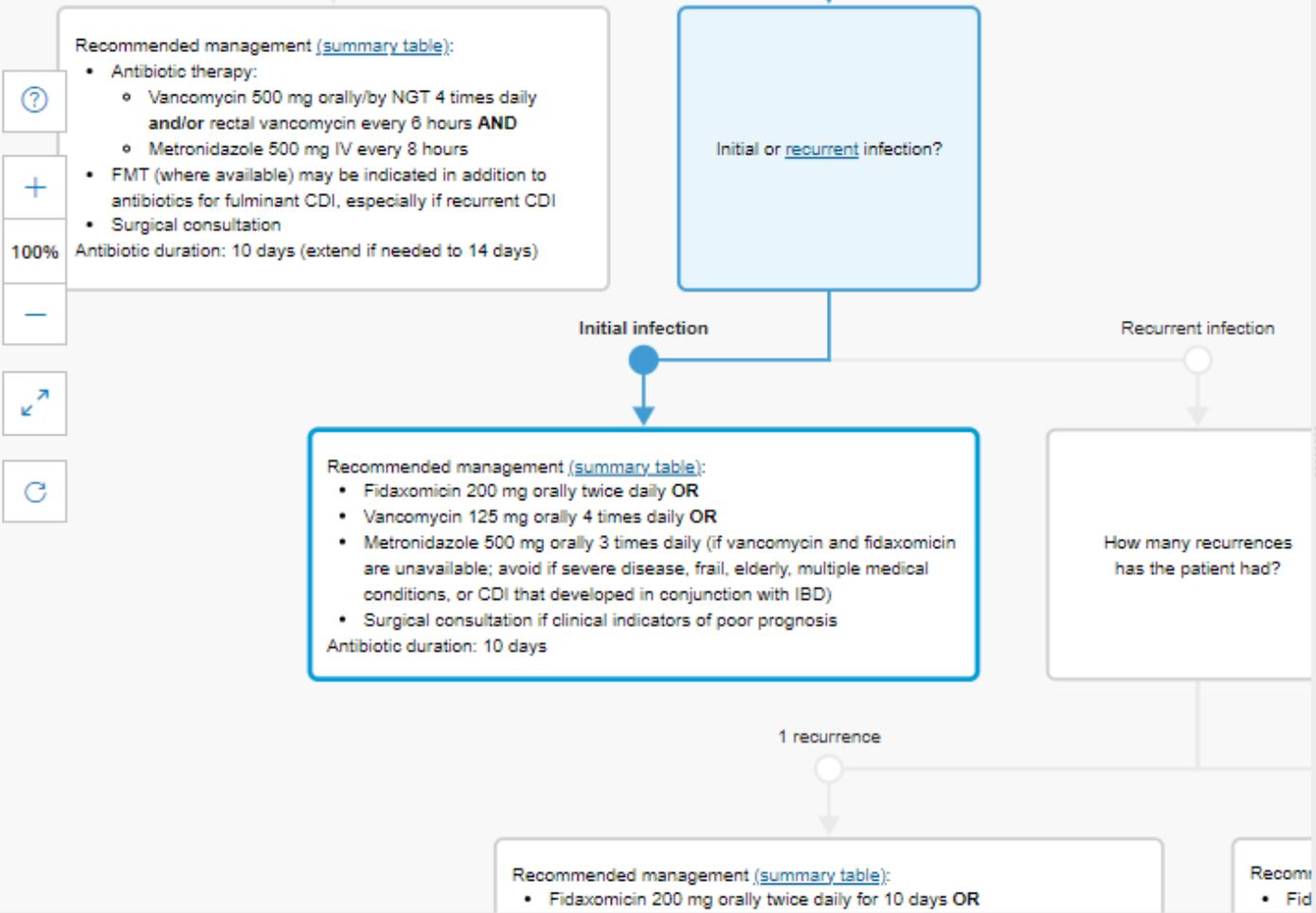
meropenem renal impairment dosing

Here are the meropenem dose adjustments:

- Renal impairment (CrCl greater than 50 mL/min) in adults: No dosage adjustment required
- Renal impairment (CrCl 26 to 50 mL/min) in adults: Increase dosing interval to every 12 hours
- Renal impairment (CrCl 10 to 25 mL/min) in adults: One-half recommended dose depending on type of infection; increase dosing interval to every 12 hours
- Renal impairment (CrCl less than 10 mL/min) in adults: One-half recommended dose depending on type of infection; increase dosing interval to every 24 hours
- Augmented renal clearance (CrCl 130 mL/min or greater): 8 to 10 g/dav either as intermittent boluses or continuous infusion

Was this helpful? 👍 🗨️

Type something...



> Cost of medications

Select an antibiotic approach.

- Fidaxomicin 200 mg orally twice daily for 10 days
- Vancomycin 125 mg orally 4 times daily for 10 days
- Metronidazole 500 mg orally 3 times daily for 10 days
- Approach other than the options provided

Select an approach to consulting surgery.

- Consult surgery
- Surgical consult not required
- Approach other than the options provided

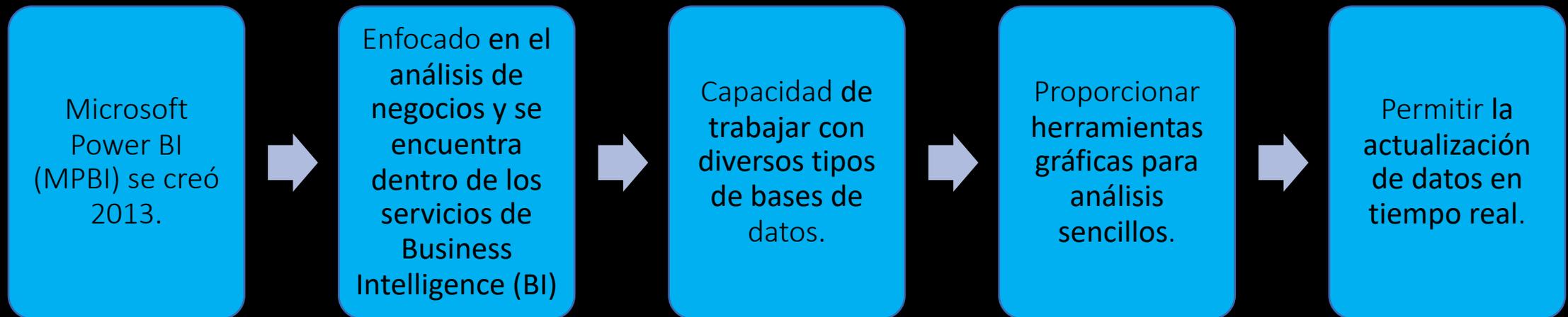
> Medication Disclaimer

Review Assessment & Plan

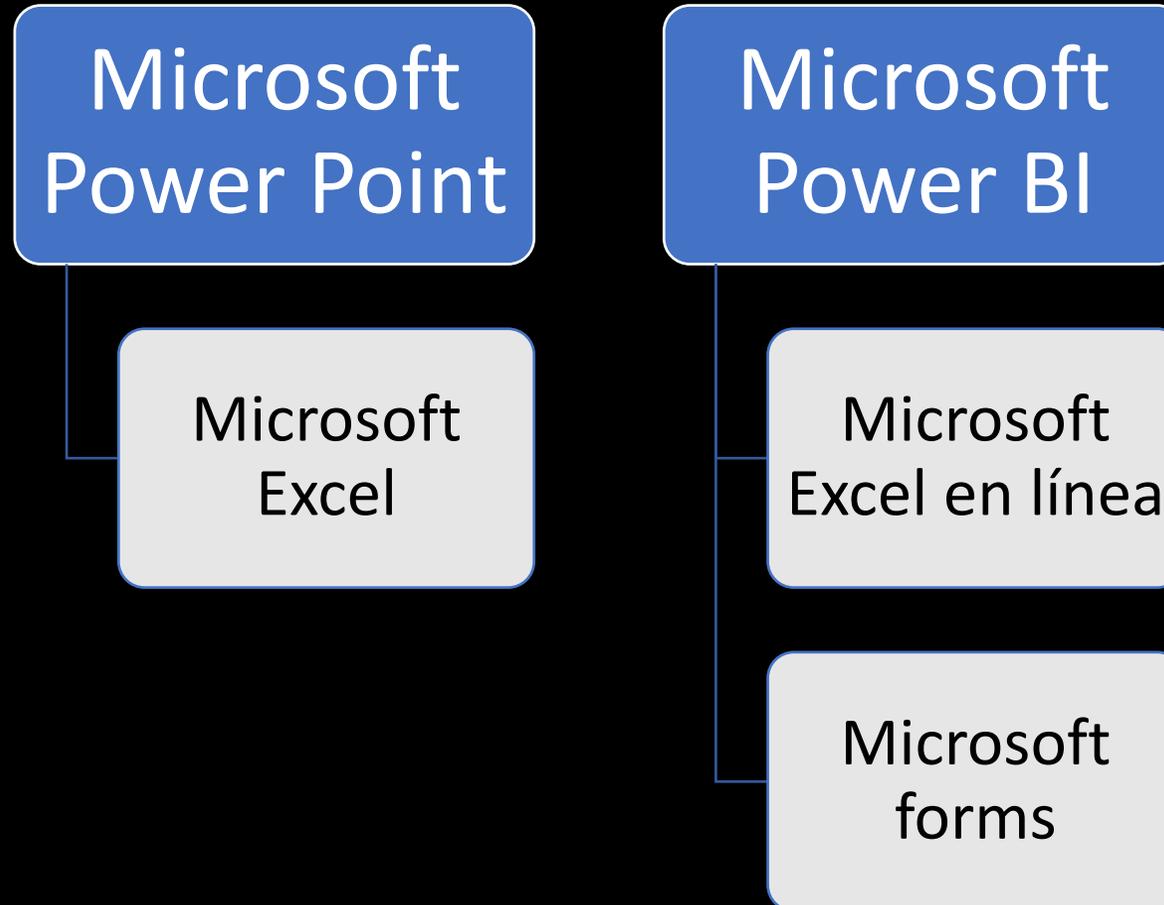
Related Content

# Power BI

- Servicios de “Business Intelligence” están enfocados al uso de datos para facilitar la toma de decisiones a través de fácil accesibilidad a la información y comprensión de la misma.
  - Implementación en el sector de salud progresiva.



# Cambiar el flujo de trabajo



# PROA| Hospital Clínica Bíblica 2022

**Evaluación de Desempeño**

Descripción del Programa



Evaluación del Riesgo Anual



Plan Anual



Consumo de Antimicrobianos



Sensibilidad



Click en cada recuadro para ver el dashboard



Investigación



Intervenciones



Guías Clínicas



Seguimiento de Antibióticos Específicos



Manejo ambulatorio



# PROA: DDDs/1000 días-paciente

Área: Hospital Clínica Bíblica

Benchmark: HCB reportes propios

Meta: 100%

Indicador: (Cantidad de Informes/4) x 100

30/06/2013

30/09/2022

100 %

Porcentaje de Cumplimiento

Carbapenémicos

Quinolonas

Cefalosporinas 3<sup>o</sup>G

Equinocandinas

Profilaxis Quirúrgica

Betalactámicos  
espectro reducido

MRSA

Azoles

DDD's/1000 días-paciente por Año, Trimestre y Antimicrobiano

Antimicrobiano

Selección múltiple



Fuente PROA HCB



# PROA: Caracterización de Prescripciones Recibidas en las Farmacias

Área: Hospital Clínica Bíblica

Benchmark: HCB reportes propios

## Origen de la Receta

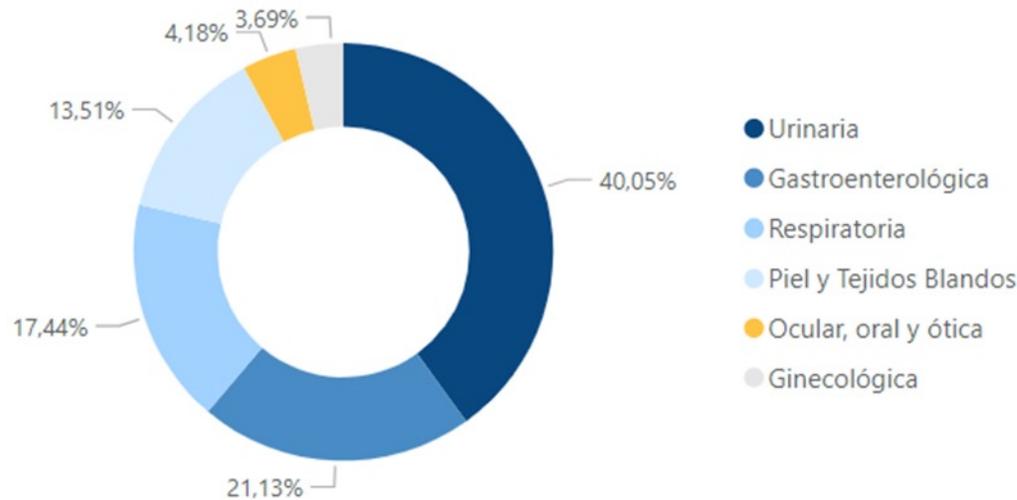


## Trimestre



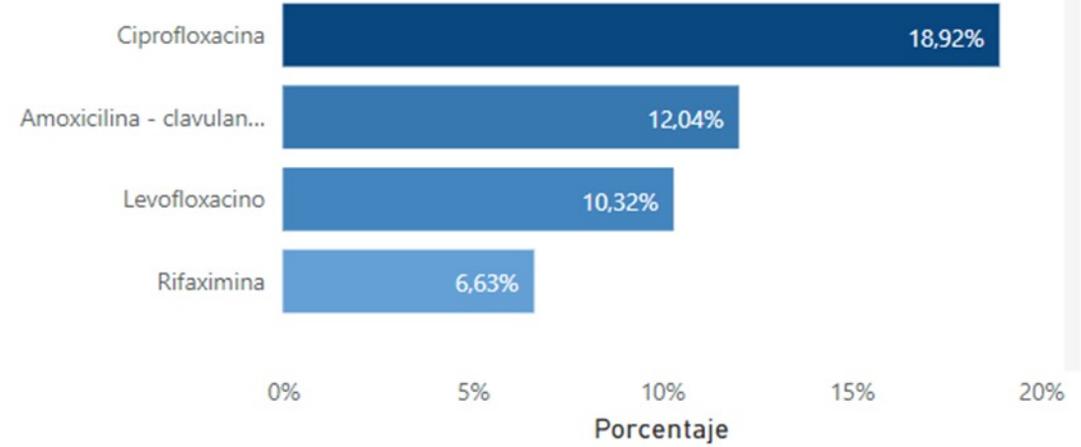
**407**  
Recetas

## Posible sitio de infección



Fuente PROA HCB

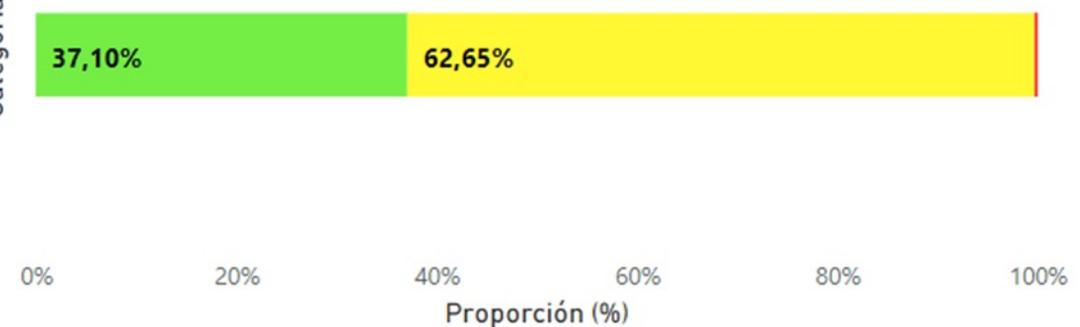
## Antibiótico prescrito



## Prescripciones según Clasificación AWaRe

● 1. Access ● 2. Watch ● 3. Reserve

Categoría



# PROA: Manejo Ambulatorio de ITU en Pacientes Adultos

Área: Hospital Clínica Bíblica    Benchmark: HCB reportes propios    Meta: 20% mejora u 80% cumplimiento    Indicador: (Ptes con manejo óptimo/Total ptes) \* 100



Trimestre

21-Q1	21-Q3	22-Q1	22-Q3
21-Q2	21-Q4	22-Q2	22-Q4

**58 %**

Selección Óptima

**253**

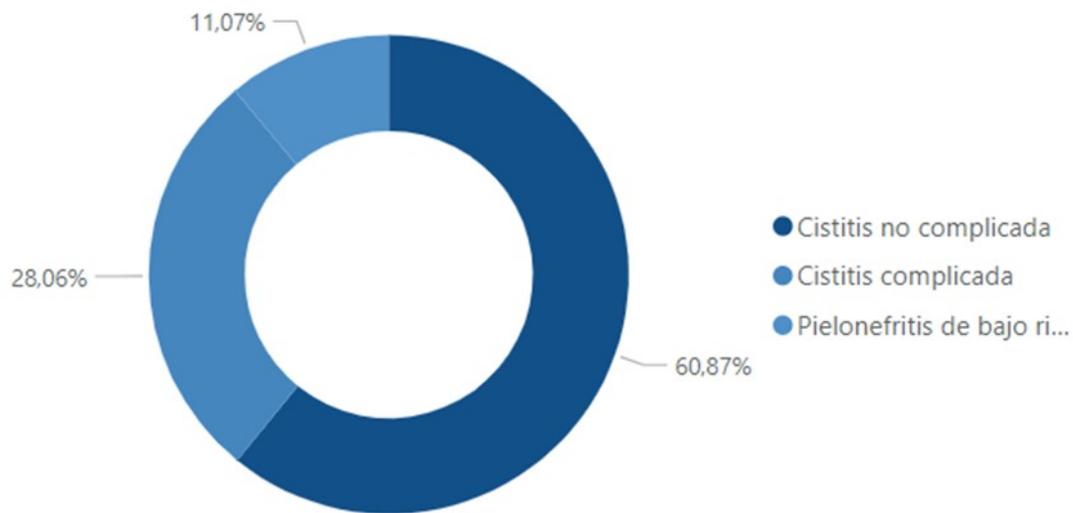
Total de Evaluaciones

Selección de Tratamiento

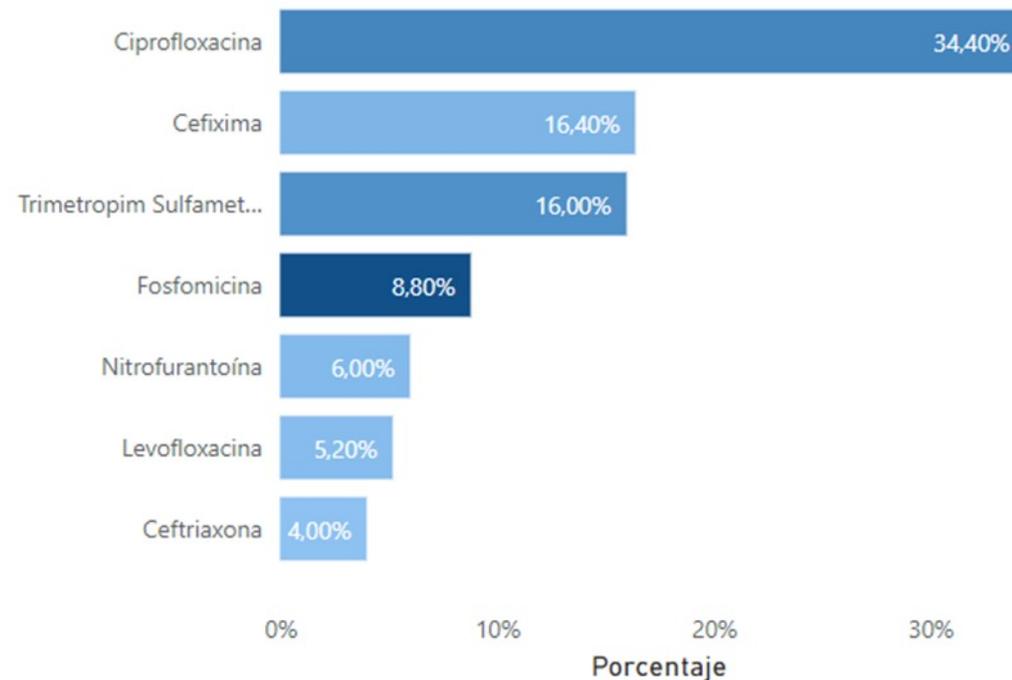
No óptima

Óptima

Tipo de Infección del Tracto Urinario



Antibióticos prescritos fijos



# PROA: Manejo Ambulatorio de ITU en Pacientes Adultos

Área: Hospital Clínica Bíblica    Benchmark: HCB reportes propios    Meta: 20% mejora u 80% cumplimiento    Indicador: (Ptes con manejo óptimo/Total ptes) \* 100

Trimestre

21-Q1	21-Q3	22-Q1	22-Q3
21-Q2	21-Q4	22-Q2	22-Q4

95 %

Selección Óptima

126

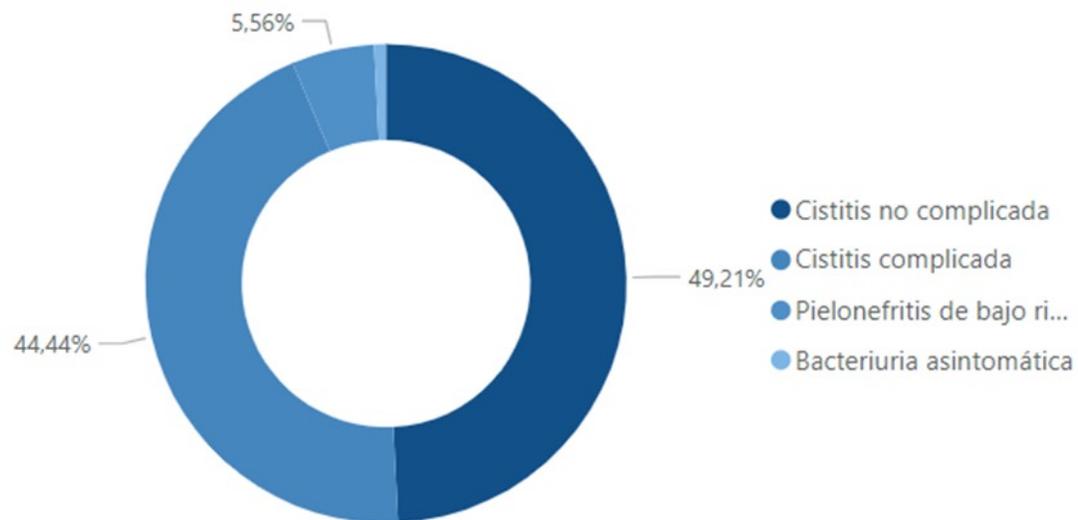
Total de Evaluaciones

Selección de Tratamiento

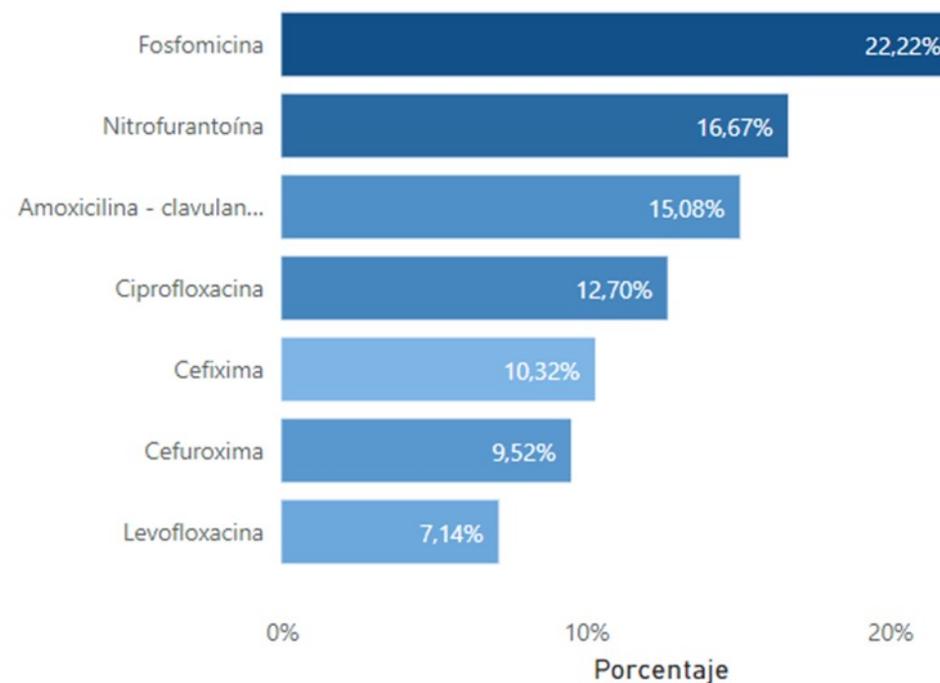
No óptima

Óptima

Tipo de Infección del Tracto Urinario



Antibióticos prescritos fijos



Área: Hospital Clínica Bíblica

Benchmark: HCB reportes propios

Trimestre

21-Q1 21-Q2 21-Q3 21-Q4 22-Q1 22-Q2 22-Q3 22-Q4

## Infecciones del Tracto Urinario

Médico	Total	Óptimas	Calificación
MED 030	18	14	78 %
MED 004	8	6	75 %
MED 027	4	3	75 %
MED 001	51	28	55 %
MED 021	2	1	50 %
MED 032	2	1	50 %
MED 033	21	10	48 %
MED 035	18	8	44 %
MED 002	6	2	33 %
MED 015	30	7	23 %
MED 011	11	2	18 %
MED 019	6	1	17 %
MED 006	1	0	0 %
MED 008	1	0	0 %
MED 013	1	0	0 %
MED 016	1	0	0 %
MED 023	1	0	0 %
MED 024	3	0	0 %
MED 025	1	0	0 %

## Neumonía Adquirida en la Comunidad

Médico	Total	Óptimas	Calificación
MED 011	1	1	100 %
MED 014	1	1	100 %
MED 015	5	5	100 %
MED 019	1	1	100 %
MED 023	3	3	100 %
MED 026	1	1	100 %

Área: Hospital Clínica Bíblica

Benchmark: HCB reportes propios

Trimestre

21-Q1 21-Q2 21-Q3 21-Q4 22-Q1 22-Q2 22-Q3 22-Q4

## Infecciones del Tracto Urinario

Médico	Total	Óptimas	Calificación
MED 016	2	2	100 %
MED 018	1	1	100 %
MED 019	15	15	100 %
MED 020	14	14	100 %
MED 022	2	2	100 %
MED 023	1	1	100 %
MED 024	3	3	100 %
MED 025	1	1	100 %
MED 028	3	3	100 %
MED 030	5	5	100 %
MED 036	9	9	100 %
MED 037	7	7	100 %
MED 039	1	1	100 %
MED 001	15	14	93 %
MED 010	7	6	86 %
MED 033	4	3	75 %
MED 027	3	2	67 %
MED 034	2	1	50 %
MED 021	1	0	0 %

## Neumonía Adquirida en la Comunidad

Médico	Total	Óptimas	Calificación
MED 009	1	1	100 %
MED 015	2	2	100 %
MED 028	1	1	100 %
MED 037	1	1	100 %

# PROA | Hospital Clínica Bíblica 2023

## Pacientes

UCI

Intermedios  
COVID

Intermedios  
Este

Intermedios  
Oeste

Tercer piso Este

Tercer piso  
Oeste

## Dashboards

Reporte diario de pacientes  
PROA



Datos  
Generales

MIASTENIA  
Diagnóstico

Médico

UCI7

14/5/2023  
Ingreso

Orden

Edad

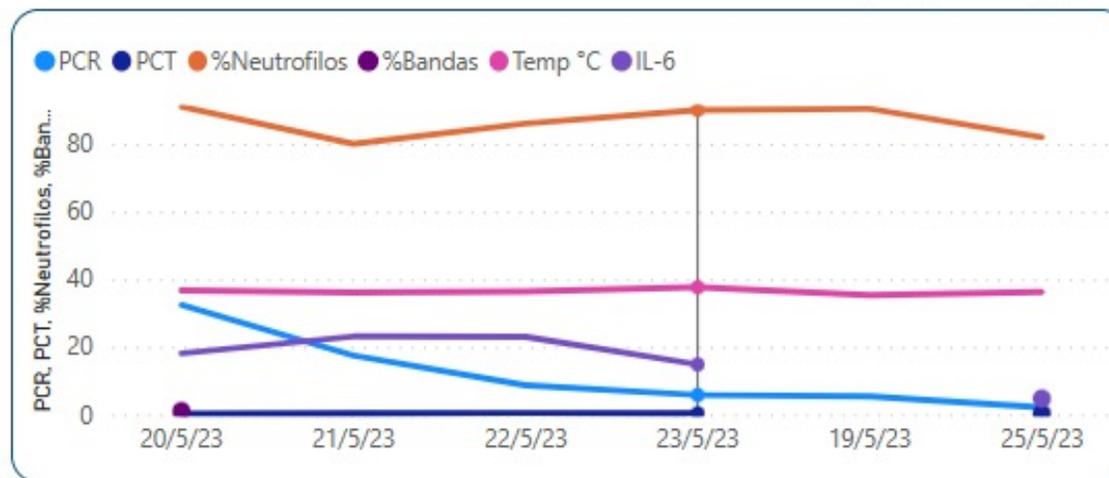
(En blanco)  
Duplicidades

2  
Intervención

Laboratorios



Fecha	Detección	Prueba	Fuente	PSA	Cultivos negativos
21/5/23	Parasitos (quistes) Citrobacter freundii, Staphylococcus aureus	Biología Molecular Cultivo	Heces Lavado bronquial	Citrobacter sensible a cetriaxona	Hemocultivo negativo por bacterias a las 48 horas
17/5/23					



Tratamiento

ABs	Dosis	Vía	DOT	Inicio	Final	AWaRe	Estado
Ceftazidima	1g TID	IV	7	19/5/23	25/5/23	Watch	Finalizado
Fluconazol	400mg QD	VO	6	21/5/23	26/5/23		Finalizado
Oxacilina	1g cada 4h	IV	7	19/5/23	25/5/23	Access	Finalizado

Fuente PROA HCB

Observaciones

Sin notas hoy. Ayer por la noche estable, buen manejo de secreciones, significativa recuperación de debilidad, extubado, sin inotrópicos.

- ←
- ⬠
- UCI
- Int.E
- Int.O
- T.O
- T.E

Área: Hospital Clínica Bíblica

Benchmark: HCB reportes propios

información actualizada diariamente

Q1-23

Q2-23

Mes

Todas

Todas

382

Pacientes PROA

6

Pacientes CDI

3

MRSA

25

Ajustes de dosis

29

Duplicidades

6

BLEES

1

VIM-IMP

51

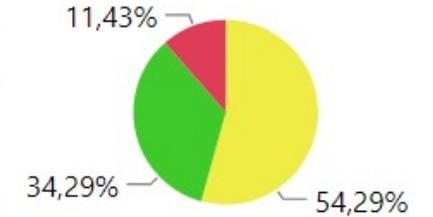
Intervenciones

28

IVOST

## Consumo AWARE

● Watch ● Access ● Reserve

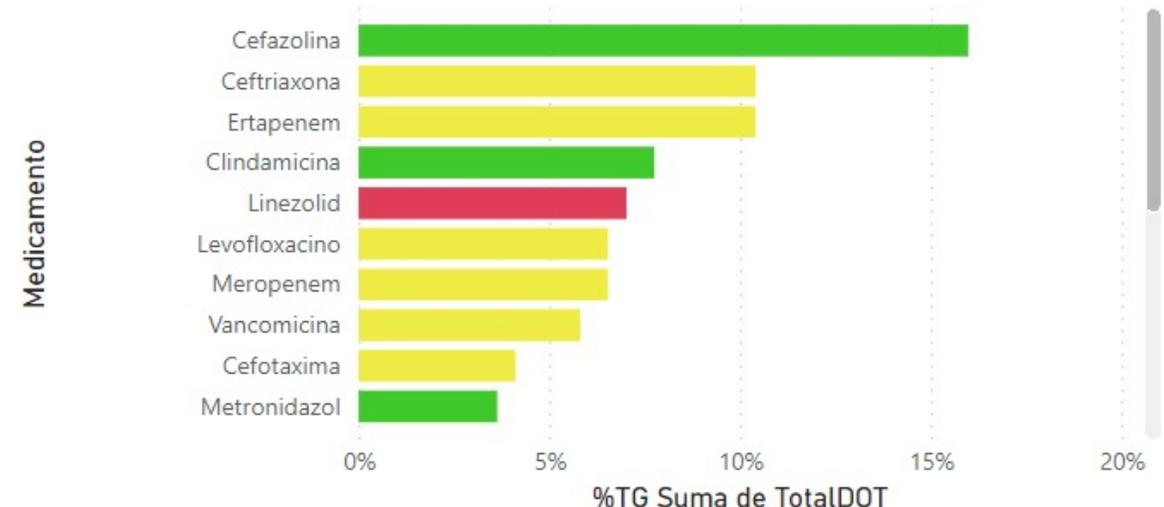


Microorganismo	TipoCultivo	PSA	Fuente-Sitio
Cultivo negativo por bacterias a las 48 horas líquido abdominal			
Abundantes bacilos Gram negativo			
Candida lusitanae			
Clostridioides difficile Toxigénico y gen de la toxina B			
Clostridioides difficile Toxina Av B			

Fuente PROA HCB

## Consumo de antibióticos (%)

● Access ● Reserve ● Watch





**Informes Interactivos**

Vigilancia genómica SARS-CoV-2

Resistencia a los Antimicrobianos

**Centros Nacionales de Referencia**

Bacteriología

Bromatología

Química clínica

Micobacteriología

Virología

Parasitología

Inocuidad Microbiológica de Alimentos

**Unidades de vigilancia especializada**

Malformaciones Congénitas

Salud Oral

**Unidad de Salud y Nutrición**

# Informe Interactivo

## Resistencia a los Antimicrobianos

The cover features the INCIENSA logo and the text: "ESTRATEGIA PARA LA VIGILANCIA DE LABORATORIO DE LA RESISTENCIA A LOS ANTIMICROBIANOS DE MICROORGANISMOS DE IMPORTANCIA EN SALUD PUBLICA EN COSTA RICA (EVILABRA)". It also includes the logo of the Centro Nacional de Referencia de Bacteriología (CNRB) and the logo of the Instituto Tecnológico de Costa Rica (TEC) BIBLICA. A button labeled "INICIAR RECORRIDO" is visible at the bottom.

**Noticias**

17-07-2023

[Visita\\_OPS-OMS\\_representantes\\_2023-05-19.pdf](#)

[Visita\\_OPS-OMS\\_representantes\\_2023-05-19.pdf](#)

17-07-2023

[Taller\\_secuenciacion\\_genomica\\_Cov-2\\_11\\_paises\\_2023-06-12.pdf](#)

[Taller\\_secuenciacion\\_genomica\\_Cov-2\\_11\\_paises\\_2023-06-12.pdf](#)

**Recursos**

Informes Epidemiológicos

Informes EED

### Pasos para obtención y manejo de los datos:

**i** Coloque el cursor sobre los números, íconos o siglas para más detalles



### Información adicional (presione el ícono):

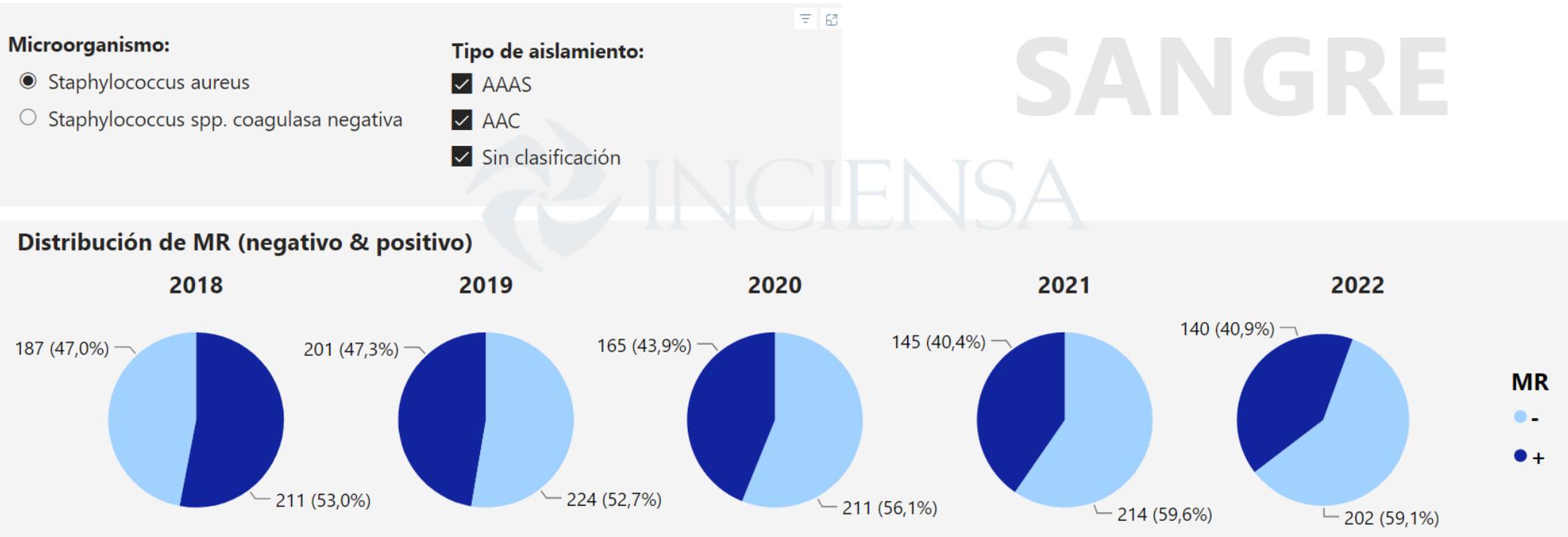
-  CNRB-Inciensa
-  Análisis
-  Interpretación
-  Control de Calidad
-  Descargo de responsabilidad
-  Uso de datos



## Resistencia a meticilina (MR):

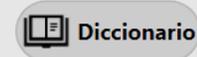
Distribución de *Staphylococcus* spp. resistentes a meticilina. Seleccione el grupo de microorganismos, año(s) y tipo(s) de aislamientos por graficar.

**NOTA:** sólo se grafican los datos que cumplan con el mínimo requerido de aislamientos.



**AAAS:** aislamiento asociado a la atención de la salud. **AAC:** aislamiento asociado a la comunidad.

Fuente: Estrategia para la Vigilancia de Laboratorio de la RAM (EVILABRA), CNRB-Inciensa & Hospitales participantes. Fecha de última actualización: 2023/07/25





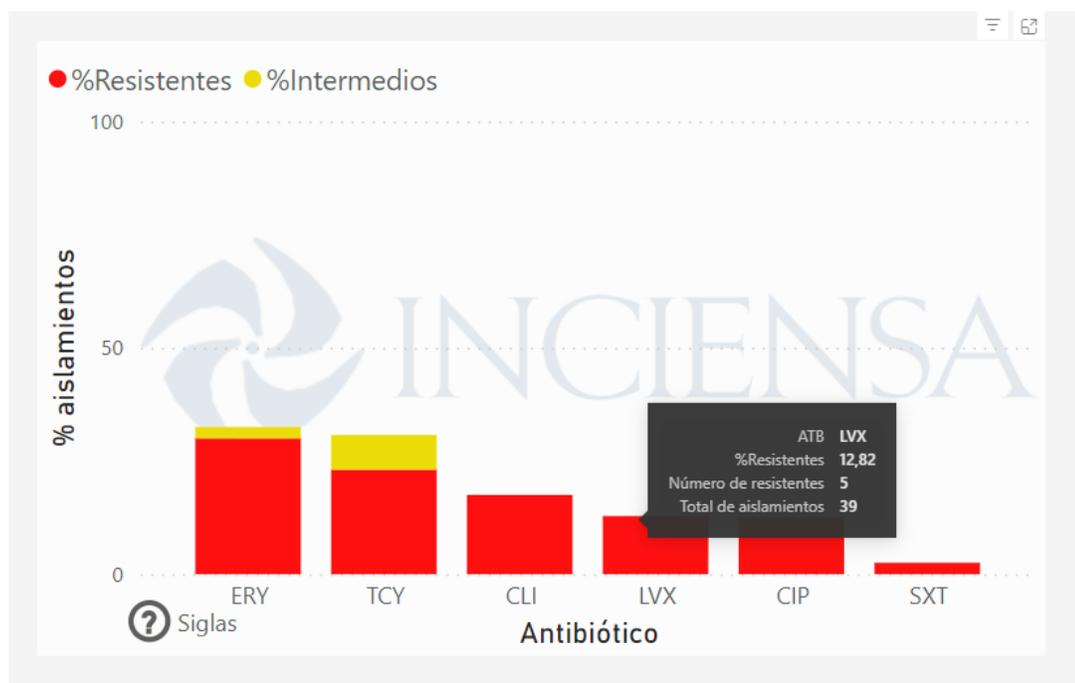
## Staphylococcus aureus

### Instrucciones:

Escoja el perfil de resistencia que desea graficar de acuerdo al tipo de *S. aureus* (MRSA +/-). El cuadro de la derecha presenta el número de aislamientos con PSA disponible para cada antibiótico por año y su resultado.

**NOTA:** sólo se grafican los datos que cumplan con el mínimo requerido de aislamientos.

# SANGRE



**MRSA**

-  +

**Tipo de aislamiento**

AAAS

AAC

Sin clasificación

**Año**

2018

2019

2020

2021

2022

Antibióticos	R+I	S	Total de aislamientos
Ciprofloxacina	5	35	40
Clindamicina	7	33	40
Eritromicina	13	27	40
Levofloxacina	5	34	39
Linezolid	0	40	40
Rifampicina	0	40	40
Tetraciclina	12	27	39
Trimetoprima-Sulfametoxazol	1	39	40
Vancomicina	0	40	40



Fuente: Estrategia para la Vigilancia de Laboratorio de la RAM (EVILABRA), CNRB-Inciensa & Hospitales participantes. Fecha de última actualización: 2023/07/25



ver atrás Sangre - MRSA RIS < > ↗

# Redes Sociales

- Las redes sociales como Twitter, Facebook, Instagram, LinkedIn se utilizan como complemento a la educación clínica tradicional sobre terapia antimicrobiana.
- Los profesionales de la salud pueden encontrar y brindar información de fácil acceso, en tiempo real y de alto rendimiento a compañeros, colegas y profesionales no sanitarios.



*Article*

## **Social media and physicians: Exploring the benefits and challenges**

**Sirous Panahi<sup>1</sup>, Jason Watson<sup>2</sup>, and Helen Partridge<sup>2</sup>**

### **Abstract**

Healthcare professionals' use of social media platforms, such as blogs, wikis, and social networking web sites has grown considerably in recent years. However, few studies have explored the perspectives and experiences of physicians in adopting social media in healthcare. This article aims to identify the potential benefits and challenges of adopting social media by physicians and demonstrates this by presenting findings from a survey conducted with physicians. A qualitative survey design was employed to achieve the research goal. Semi-structured interviews were conducted with 24 physicians from around the world who were active users of social media. The data were analyzed using the thematic analysis approach. The study revealed six main reasons and six major challenges for physicians adopting social media. The main reasons to join social media were as follows: staying connected with colleagues, reaching out and networking with the wider community, sharing knowledge, engaging in continued medical education, benchmarking, and branding. The main challenges of adopting social media by physicians were also as follows: maintaining confidentiality, lack of active participation, finding time, lack of trust, workplace acceptance and support, and information anarchy. By revealing the main benefits as well as the challenges of adopting social media by physicians, the study provides an opportunity for healthcare professionals to better understand the scope and impact of social media in healthcare, and assists them to adopt and harness social media effectively, and maximize the benefits for the specific needs of the clinical community.

# Perfiles de interés

 **Bug Pharmacist** 🧴🩺 **Tim Gauthier** ✓  
@IDstewardship Following  
I ❤️ bugs & drugs. #Pharmacist #SaveABX 🌟: 35K, ✉️: 25K, 👍: 22K 🌐:  
5M. 🗣️ Opinions mine. SUBSCRIBE: [bit.ly/SubscribeYea](https://bit.ly/SubscribeYea)

 **Paul Sax**  
@PaulSaxMD Following  
Harvard/Brigham Infectious Diseases doctor, writer, @CIDJournal editor, educator. Prefer baseball to football, pizza to sushi, dogs to cats, Beatles to Stones.

 **Antibiotic Steward Bassam Ghanem** ID 🌟  
@ABsteward Following  
Stay up-to-date in Infectious Diseases, Clinical Pharmacist, #IDXposts  
AKA #IDTwitter T🌟P influencer, @Wiki\_Guidelines ,Interstellar, 🌹❤️ Misk

 **Erin McCreary**  
@ErinMcCreary Following  
Director of Infectious Diseases Improvement & Clinical Research Innovation @UPMC @PittDeptofMed. Host, Breakpoints @SIDPharm. Passionate about patients.

 **SIDP**  
@SIDPharm Following  
Official Twitter account of the Society of Infectious Diseases Pharmacists (SIDP). #AntimicrobialStewardship #IDTwitter COVID-19 Resources: [sidp.org/covid19](https://sidp.org/covid19)

 **Sochinf**  
@SochinfOficial Following  
Sociedad Chilena de Infectología. Trabajamos en la prevención, diagnóstico y tratamiento de las enfermedades infecto-contagiosas.

# Imágenes generadas por IA

Generar, por  
favor, una  
imagen de un  
farmacéutico  
chileno del  
PROA

# Imágenes generadas por IA

Darme por favor una imagen de farmacéutico chileno del PROA



# Muchas gracias por la atención

Correo electrónico:  
[jp.diazm27@gmail.com](mailto:jp.diazm27@gmail.com)

