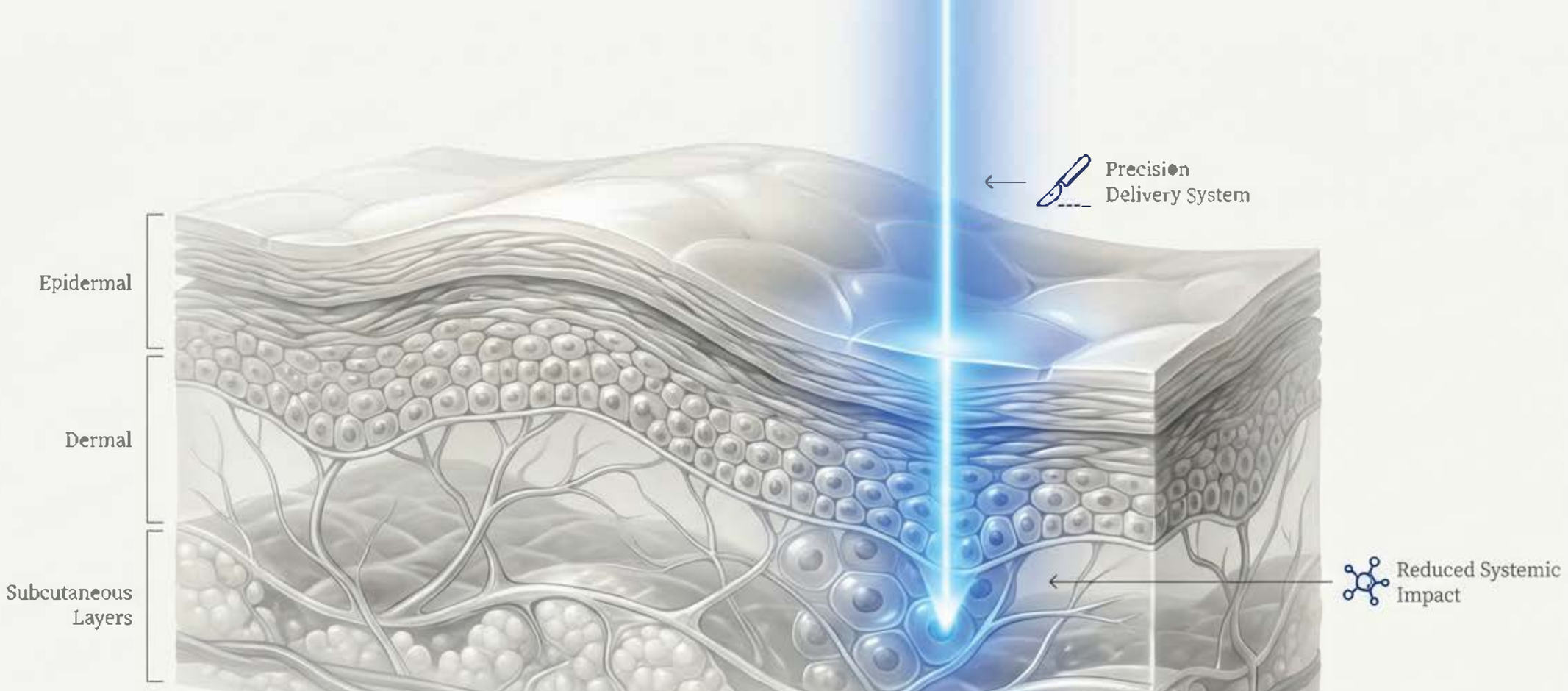


Targeted Antibiotics: A New Surgical Standard

Surgical Site Infections Represent a Major Global Burden of Disease

>20 Million

Patients affected by SSIs annually worldwide.

~290,000

Annual SSIs in the U.S. alone, leading to approximately 8,000 deaths.

2x  more likely to die

5x  more likely to be readmitted

60%  more likely to be admitted to an ICU

SSIs remain a primary source of global morbidity and a significant challenge to patient safety. Despite existing protocols, their incidence continues to place a heavy burden on patients and healthcare systems alike.

The Financial Impact is Staggering and Unsustainable

+7.8 Days

Average incremental Length of Stay (LOS) per surgical site complication for a Medicare patient.

+$15,339

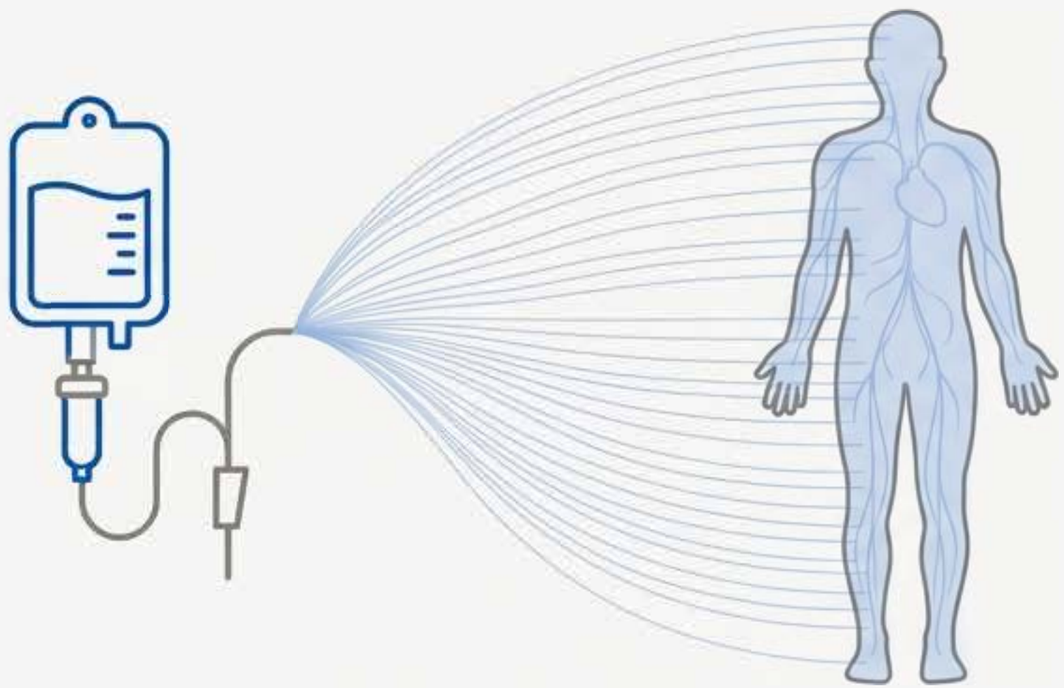
Average incremental cost per complication.

The Devastating Cost of a Single Preventable SSI

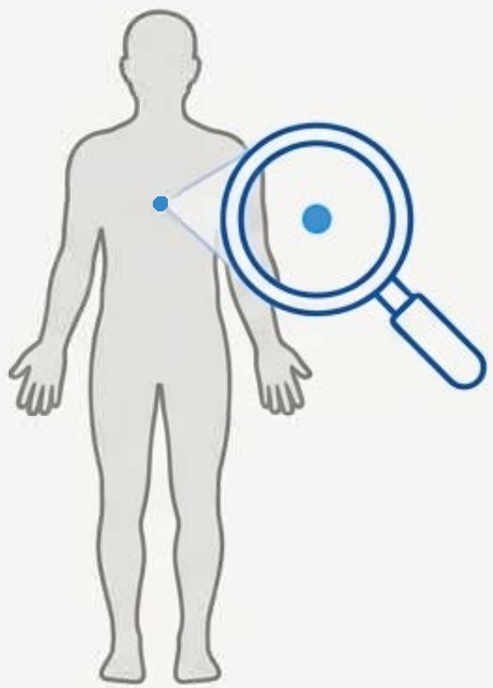
A real-world case study at Maine Medical Center involving a deep sternal wound infection after cardiac surgery resulted in a **$160,000 financial loss** for the institution. This cost is considered preventable and is not reimbursed by CMS.

Maine Medical Center
MaineHealth

Our Decades-Old Strategy Relies on Systemic Flooding



Systemic Delivery / Gram-level Dose

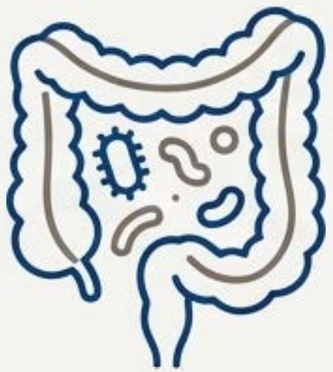


Target: Surgical Incision

The current paradigm for SSI prevention is high-dose, systemic antibiotic prophylaxis. A gram-level dose is administered intravenously, exposing the entire patient microbiome to the antibiotic in an attempt to protect a small surgical site.

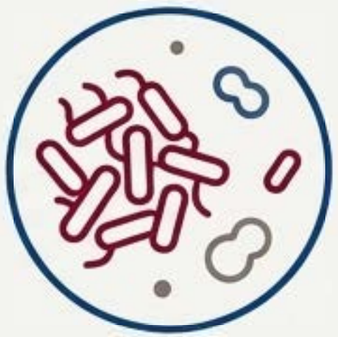
"Modern SSIs represent a 'failure to control the host-microbiome during surgery.'" - Long et al., Anesthesiology

This Protective Shield Inflicts Widespread Collateral Damage



Gut Microbiome Disruption

A single 7-day course of oral clindamycin can alter the gut microbiome for up to 2 years.

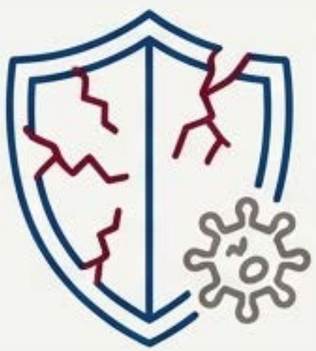


Increased Secondary Infection Risk

Systemic antibiotic use is a significant risk factor for *Clostridium difficile* infection (CDI), a potentially life-threatening condition.

Driving Antimicrobial Resistance (AMR)

Exposing the entire microbiome to gram-scale antibiotics drives resistance selection. 40-50% of SSIs are now caused by microbes resistant to standard prophylactic antibiotics.



Impaired Immune Function

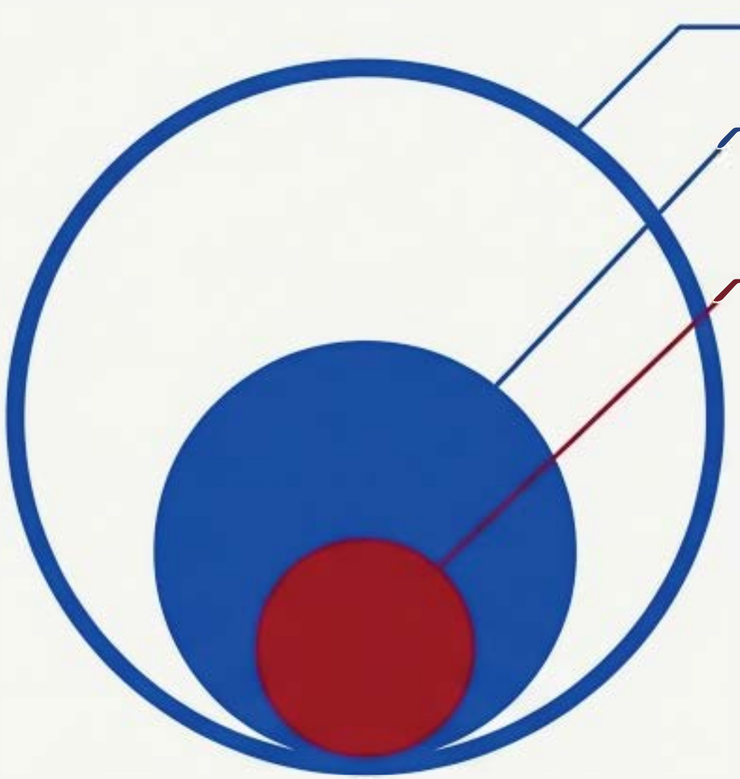
Recent antibiotic exposure is associated with reduced antibody responses to vaccinations and diminished efficacy of cancer immunotherapies.

Systemic Antibiotic Overuse Fuels the Epidemic of *C. difficile*

439,237

Primary *C. difficile* infections (CDI) annually in the U.S.

Source: NIH Modeling Study



439,237 primary infections

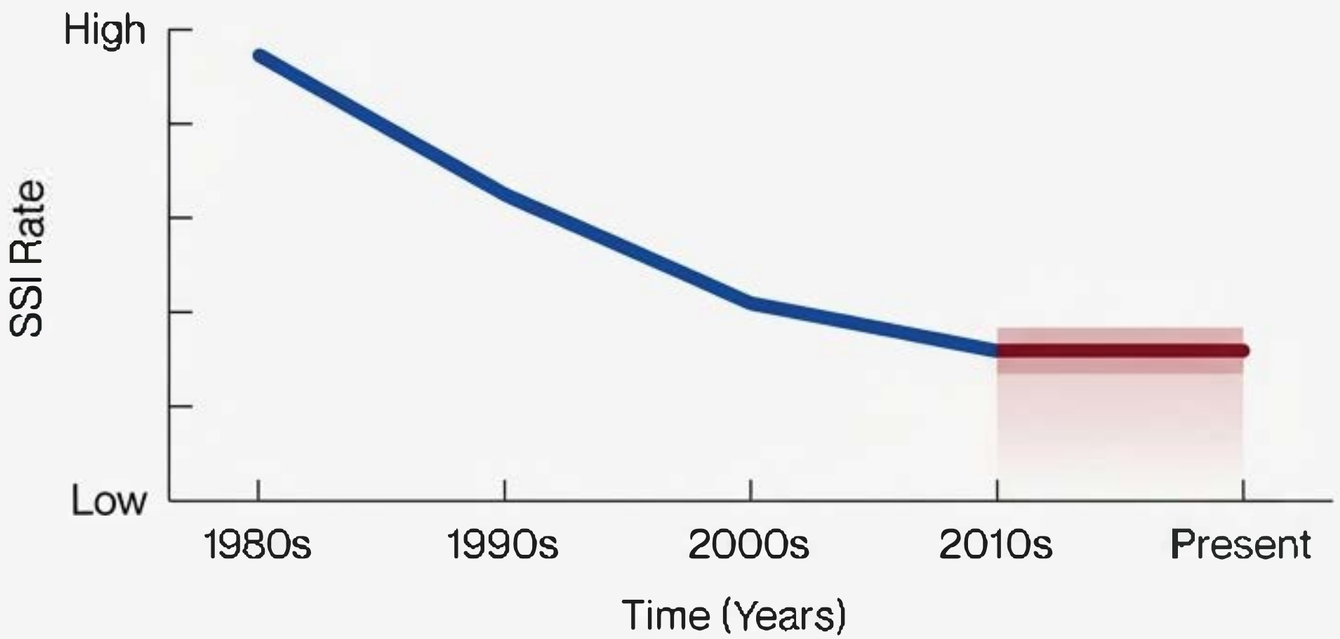
166,821 recurrent cases

44,572 attributable deaths

The link between systemic antibiotic use and CDI is well-established. This is not a rare complication, but a widespread public health crisis directly exacerbated by our current prophylactic strategies.

Despite the Systemic Harm, Our Progress Against SSIs Has Stalled.

Progress in Reducing Surgical Site Infection Rates Has Stalled



Policy Failure

A national study of the CMS HACRP program found it **ineffective in reducing SSIs** for targeted procedures, with rates exhibiting "fluctuations rather than consistent increases or decreases."

Execution Failure

Non-compliance with critical timing guidelines for antibiotic administration has been observed in **up to 88% of patients**, blunting effectiveness.

The current strategy is simultaneously causing harm and failing to protect patients.

The Solution is Not a Stronger Antibiotic. It is a Smarter Delivery System.

Systemic Delivery
Gram-Level Dose
High Collateral Damage

Targeted Delivery
Micro-Dose
Minimal Systemic Exposure

A paradigm shift from indiscriminate flooding to targeted precision.

Precision Delivery: Concentrating Antibiotics Where They Matter Most

Analogous to the Mantoux Test

The principle is a precise, microdose injection directly into the dermis. This delivers high antibiotic concentrations at the incision site—where most SSIs originate—while dramatically limiting systemic absorption.

90% Reduction

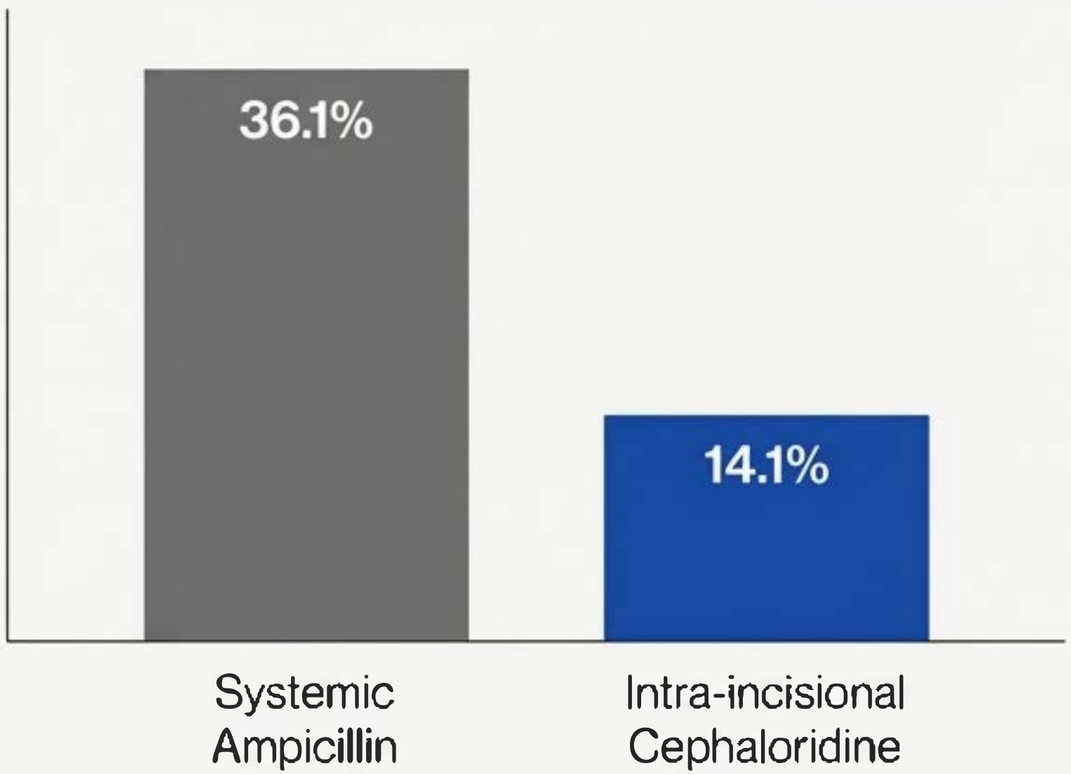
in systemic exposure, selectively lowering global AMR pressure with ID cefazolin." (Quote from ARPA-H Dossier)

A Foundational Concept with Landmark Clinical Evidence

Study Details

- **Publication:** British Journal of Surgery, 1977
- **Authors:** Pollock et al.
- **Title:** "Single dose intra-incisional antibiotic prophylaxis"
- **Summary:** In a controlled trial of 410 high-risk operations, a single dose of intra-incisional cephaloridine was dramatically more effective than systemic ampicillin.

Sepsis Rates in High-Risk Patients (Pollock et al., 1977)



A Rigorous, Phased Pathway to a New Global Standard

Formulation finalization, device optimization (e.g., depth-limited autoinjectors), bench and porcine studies, pilot trials

International pragmatic trials, measurement of both SSI and AMR impact, global mass model validation

Development of implementation package, WHO engagement, global deployment modeling for >100M procedures annually

The New Standard: From Systemic Flooding to Targeted Precision.

Systemic Prophylaxis (The Past)

Method: Indiscriminate ‘Systemic Flooding’

Dose: Gram-level

Impact: **High collateral damage (AMR, CDI)**

Efficacy: Stalled; progress has plateaued

Outcome: **Drives resistance**

Targeted Prophylaxis (The Future)

Method: Precise Intra-incisional Delivery

Dose: Micro-dose

Impact: **≥90% reduction in systemic exposure**

Efficacy: Target of **≥50% SSI reduction**

Outcome: **Preserves antibiotic efficacy**

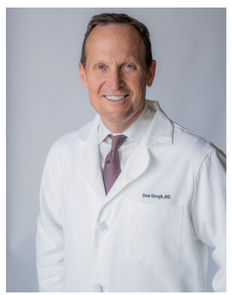
Redefining the Future of Surgical Safety and Antibiotic Stewardship

$$\frac{IR^{*}ID}{IR^{*}IV} \approx 0.1$$

The predicted equilibrium of resistant infections under intradermal (ID) dosing is approximately **10%** of that under intravenous (IV) dosing.

This represents a potential **90% reduction in resistant infections**—a paradigm shift that improves outcomes for millions, reduces healthcare costs, and preserves our most critical medicines for generations to come.

The Special Forces Unit Assembled for This Mission.



Dowling B. Stough, MD (PI)

Clinical trial leader with 200+ trials conducted. Holds patents on surgical devices. Founder of a commercial pharma company. (Burke Therapeutics).

Ryan K. Dare, MD

Infectious Diseases expert. Director of the UAMS Antimicrobial Stewardship Stewardship Program. Nationally recognized
(featured on CBS 60 Minutes).

Patrick J. Quinlan, MD

Health system visionary. CEO Emeritus of Ochsner Health System, recognized as "most powerful physician executive in the US." Deep experience in commercialization and health policy.

Angela Sutterer, PhD

20+ years in pharma development. Proven experience in NOA, ANDA, and OTC product development, from API to finished sterile injectables.