UWTASP
tele-antimicrobial stewardship program

November 7th, 2023

Agenda

- What's the Situation and Why? Surgery Practice and Stewardship
- Community Case and Discussion

IDWeek

Clinical Infectious Diseases
MAJOR ARTICLE

Adherence to Antimicrobial Prophylaxis Guidelines for Elective Surgeries Across 825 US Hospitals, 2019–2020

Stephanie M. Cabral,[1] Anthony D. Harris,[2] Sara E. Cosgrove,[3] Laurence S. Magder,[2] Pranita D. Tamma,[4] and Katherine E. Goodman[2]

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	All Surgeries (N = 521 091)	Guideline Adherent (n = 308 760; 59%)	Guideline Nonadherent (n = 212 331; 41%)
Procedural characteristics			
Procedure			
Craniotomy	20 974 (4.0)	12 901 (4.2)	8073 (3.8)
Hip replacement	149 059 (28.6)	97 158 (31.5)	51 901 (24.4)
Knee replacement	192 872 (37.0)	119 050 (38.6)	73 822 (34.8)
Spinal procedure	143 357 (27.5)	70 576 (22.9)	72 781 (34.3)
Hernia repair	14 829 (2.8)	9075 (2.9)	5754 (2.7)
Year			
2019	357 378 (68.6)	212 961 (69.0)	144 417 (68.0)
2020	163 713 (31.4)	95 799 (31.0)	67 914 (32.0)
Patient characteristics			
Age, mean (SD), years	64.8 (11.5)	65.0 (11.4)	64.5 (11.7)
Male sex	225 080 (43.2)	134 080 (43.4)	91 000 (42.9)

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	All Surgeries (N = 521 091)	Guideline Adherent (n = 308 760; 59%)	Guideline Nonadherent (n = 212 331; 41%)
Documented antibiotic allergy[a]	44 683 (8.6)	29 433 (9.5)	15 250 (7.2)
MRSA carrier or high risk for MRSA[b]	7409 (1.4)	5197 (1.7)	2212 (1.0)
Hospital characteristics			
Teaching hospital	256 586 (49.2)	155 299 (50.3)	101 287 (47.7)
Bed size			
0–99	38 337 (7.4)	22 016 (7.1)	16 321 (7.7)
100–199	85 654 (16.4)	53 393 (17.3)	32 261 (15.2)
200–299	93 345 (17.9)	55 727 (18.0)	37 618 (17.7)
300–399	88 454 (17.0)	51 917 (16.8)	36 537 (17.2)
400–499	61 177 (11.7)	38 491 (12.5)	22 686 (10.7)
≥500	154 124 (29.6)	87 216 (28.2)	66 908 (31.5)

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Table 2. Reason(s) for Guideline Nonadherence Across 212 331 Nonadherent Elective Surgical Procedures, Stratified by Surgery Type

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Inappropriate vancomycin use[a]	4406 (54.6)	40 010 (77.1)	55 722 (75.5)	62 330 (85.6)	962 (16.7)	163 430 (77.0)
Vancomycin + cefazolin	1903 (23.6)	28 348 (54.6)	37 536 (50.8)	42 937 (59)	198 (3.4)	110 922 (52.2)
Vancomycin monotherapy	926 (11.5)	4199 (8.1)	5906 (8.0)	8554 (11.8)	313 (5.4)	19 898 (9.4)
Vancomycin, cefazolin + gram-negative agent[b, c]	261 (3.2)	3018 (5.8)	4986 (6.8)	3715 (5.1)	98 (1.7)	12 078 (5.7)
Vancomycin, cefazolin + other[b]	274 (3.4)	1605 (3.1)	2973 (4.0)	1864 (2.6)	126 (2.2)	6842 (3.2)
Vancomycin + clindamycin	141 (1.7)	1669 (3.2)	2296 (3.1)	2032 (2.8)	20 (0.3)	6158 (2.9)
Vancomycin + other[b]	710 (8.8)	588 (1.1)	1089 (1.5)	1707 (2.3)	158 (2.7)	4252 (2.0)
Vancomycin + gram-negative agent[c]	191 (2.4)	583 (1.1)	936 (1.3)	1521 (2.1)	49 (0.9)	3280 (1.5)
Inappropriate gram-negative use[c, d]	1281 (15.9)	10 579 (20.4)	16 230 (22.0)	11 181 (15.4)	1746 (30.3)	41 017 (19.3)
Inappropriate clindamycin use[e]	831 (10.3)	5225 (10.1)	7672 (10.4)	5399 (7.4)	936 (16.3)	20 063 (9.4)
Spectrum too broad	1924 (23.8)	1855 (3.6)	2984 (4.0)	2721 (3.7)	2018 (35.1)	11 502 (5.4)
Inappropriate oral antibiotic use	500 (6.2)	2162 (4.2)	2851 (3.9)	2577 (3.5)	405 (7.0)	8495 (4.0)
Inappropriate spectrum[b]	197 (2.4)	273 (0.5)	458 (0.6)	134 (0.2)	973 (16.9)	2035 (1.0)
Spectrum too narrow	1481 (18.3)	990 (1.9)	3336 (4.5)	1105 (1.5)	96 (1.7)	7008 (3.3)

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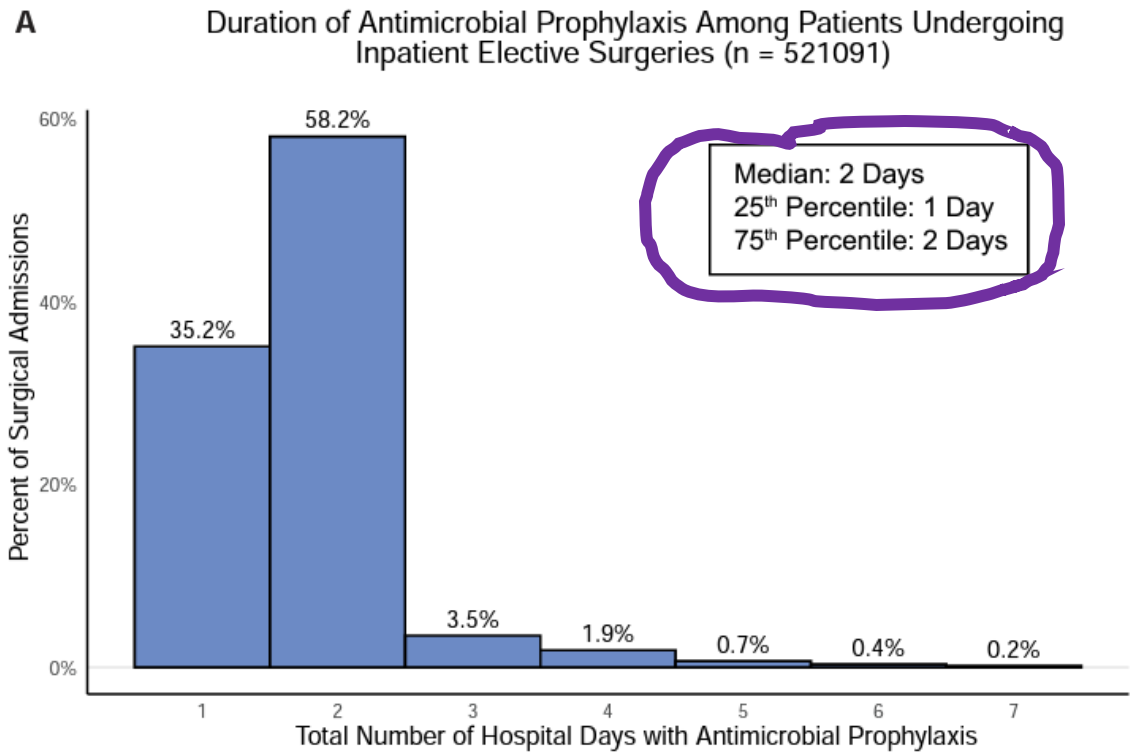
A



B

Duration Distribution for Select Antimicrobial Agents

Antimicrobial Agent	No. (%) Patients Receiving Agent	Patients Receiving Agent Only on Day 1	Patients Receiving Agent For 2 Days	Patients Receiving Agent > 2 Days
Cefazolin	458092	163667 (35.7)	273002 (59.6)	21423 (4.7)
Vancomycin	176966	147846 (83.5)	21802 (12.3)	7318 (4.1)
Clindamycin	24680	11684 (47.3)	11351 (46.0)	1645 (6.7)

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RESEARCH ARTICLE

Tipping the balance: A systematic review and meta-ethnography to unfold the complexity of surgical antimicrobial prescribing behavior in hospital settings

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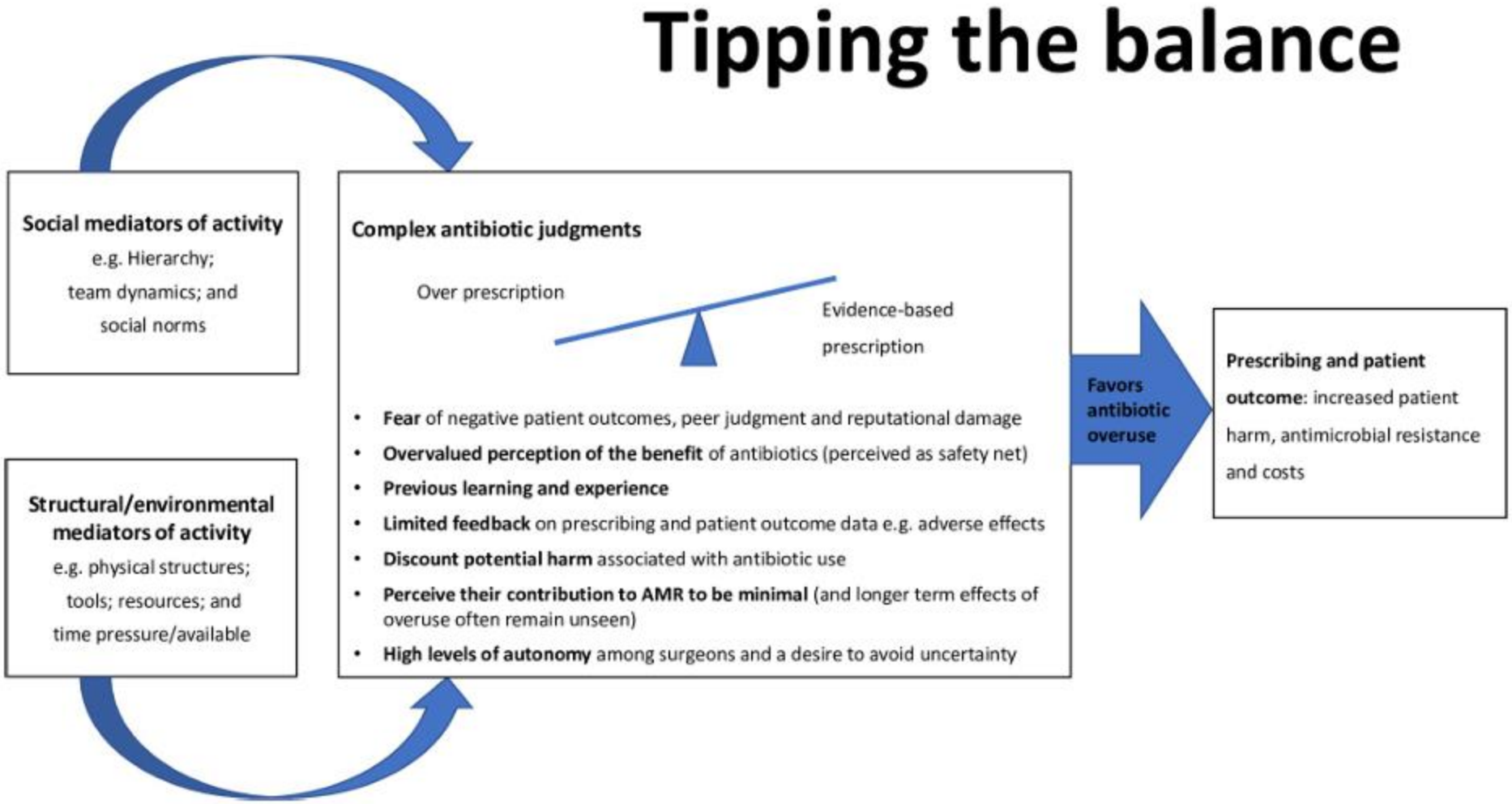

Fig 2. Conceptual model showing how social and structural mediators influence individual complex judgements about whether to prescribe antimicrobials for surgical patients, currently tipping the balance towards unnecessary antimicrobial use and resulting in increased patient harm, AMR and cost.

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Table 4. Translation of second order concepts, from the 14 included papers, into overarching (third order) concepts.

Overarching concept*	Second order concepts contributing to the overarching (third order) concept
Hierarchy	• Hierarchical relationships and power • Uptake in knowledge and change in practice • Senior ownership and engagement • Individualism • Hierarchy • SAP decisions are entrenched within hierarchical relationships • Responsibility and power dynamics
Fear drives action	• Fear of infectious complications drives overuse of SAP • Ownership of surgical risk • Fear and the need and expectation to intervene • Fear and the impetus to "do something" • Fear is a driving factor for the prolongation of SAP • Surgeons fear adverse patient outcomes • Antibiotics a safety net
Deprioritized	• SAP decision making is a peripheral issue • Other tasks are prioritized above antibiotic decision making • Antibiotic management is a peripheral issue • Antimicrobial stewardship has a low priority • SAP is a low priority for surgeons • SAP prescription is not considered a priority • Antibiotic prescribing is not prioritized and is rarely discussed

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Overarching concept*	Second order concepts contributing to the overarching (third order) concept
Convention trumps evidence: skepticism and improvisation limit the impact of surgical antibiotic prophylaxis (SAP) evidence-based guidelines, and social norms shape action	• Improvisation behaviors • Trust, disagreement and clinical judgement • Guideline limitations and autonomy • Gaps warrant exceptions • Skepticism
Complex judgements	• Tolerance of uncertainty • Lack of feedback • Antibiotic decision making • Risk assessment • Overvalued perception of the benefit of antimicrobials • Antibiotics a conservative intervention
Discontinuity of care: physical and team structures create silos and barriers to communication and workflow	• Separation of the infectious diseases team • Constant state of flux • Time • Not part of the team • Physical work environment • Physical proximity • Consulting service
Team dynamics and interactions create unrealized potential	• Unrealized potential • Relationship dynamics • Inter-specialty team dynamics • Collaboration and challenge between diverse practice groups

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Discontinuity of care: physical and team structures create silos and barriers to communication and workflow	• Separation of the infectious diseases team • Constant state of flux • Time • Not part of the team • Physical work environment • Physical proximity • Consulting service
Team dynamics and interactions create unrealized potential	• Unrealized potential • Relationship dynamics • Inter-specialty team dynamics • Collaboration and challenge between diverse practice groups

RESEARCH ARTICLE

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Hazel Parker[1]*, Julia Frost[2], Jo Day[2], Rob Bethune[3], Anu Kajamaa[4], Kieran Hand[5], Sophie Robinson[2], Karen Mattick[2]

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Overarching concept*	Second order concepts contributing to the overarching (third order) concept
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Overarching concept*	Second order concepts contributing to the overarching (third order) concept
Practice environment: organizational features and resources nudge decision-making	• Absence of structured handover tools • Organizational and structural determinants can promote overuse of SAP • Unavailability or interrupted supply of antimicrobial agents • Structural issues • Private context

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Among surgical specialties, there is typically a very steep hierarchy [26,71]. This can limit input from the wider healthcare team, such as from those at the bedside providing direct patient care and from infection experts, which represents a missed opportunity [62,64]. Furthermore, uptake of knowledge and change in practice is often determined by the hierarchy as exemplified by a quote from a doctor involved in a surgical quality improvement intervention: '*When your boss says, "This is what I want done," that's how you start to go, "Right, well this is not just something that the fairies are telling me must happen, but this is something that my boss wants," and. . . that tends to sometimes just get it to happen*' [58]. The comment epitomizes the unquestioning fashion with which juniors follow the the consultant surgeon (who has the clinical decision making power to make things happen), and shows how other players (fairies) may be ineffective to drive change. In this way, the hierarchy can perpetuate rituals (such as non-evidence based, prolonged surgical prophylaxis); reinforce mistrust in the current evidence-base; and maintain a status quo in which antimicrobials are not prioritized, underscoring the importance of the surgical milieu vis-a-vis antimicrobial misuse [6,72].

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The important role of team dynamics suggests that stewardship teams should prioritize building relationships with consultant surgeons and chiefs of surgery. They must also be mindful that much of the 'errant' prescribing comes from a good place i.e. a sense of benevolence towards the patient [28]. Rather than criticizing surgical teams for poor performance, stewardship teams must step up as infection experts, to present convincing arguments, backed by high-quality evidence from relevant patient populations, to demonstrate benefits and lack of unintended consequences for patients, thereby challenging entrenched behaviors. Additionally, feedback on clinical outcomes (e.g. SSIs and adverse drug reactions), and prescribing, should be provided to individual surgeons, benchmarked with their peers, to demonstrate (and reassure) that over-prescribing does not deliver better outcomes.

10 GOLDEN RULES FOR OPTIMAL ANTIBIOTIC USE IN HOSPITAL SETTINGS

1. Enhancing infection prevention and control
2. Prescribing antibiotics when they are truly needed
3. Prescribing the appropriate antibiotic(s) at the right time
4. Administering antibiotics in adequate doses and routes
5. Initiating, as soon as possible, targeted treatment based on the results of culture and susceptibility testing
6. Using the shortest duration of antibiotics based on evidence
7. Achieving source control by identifying and eliminating the source of the infection or reducing the bacterial load
8. Supporting surveillance of HAIs and AMR, monitoring of antibiotic use, consumption, and the quality of prescribing
9. Educating staff and improving awareness
10. Supporting multidisciplinary ASPs and enhancing collaboration of healthcare professionals from various disciplines

doi: 10.1186/s13017-023-00518-3