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Major Article

The impact of health care provider relationships and communication dynamics on urinary tract infection management and antibiotic utilization for long-term care facility residents treated in the emergency department: A qualitative study



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Background: For older adults, over diagnosis of urinary tract infections (UTI) is a primary driver of inappropriate antibiotic use. This risk is increased for patients in long-term care facilities (LTCF), especially as they transition back and forth to emergency departments (ED). In this study, we aimed to understand how health care provider communication and relationship dynamics affect LTCF residents treated in the ED to identify barriers to antibiotic stewardship for UTIs.

Methods: We conducted semi-structured interviews with nurses and physicians from LTCFs and EDs, guided by the Systems Engineering Initiative for Patient Safety framework. Data were systematically coded and underwent iterative, conventional, content analysis.

Results: We interviewed 16 LTCF and 16 ED providers across Wisconsin. ED and LTCF nurses have a critical role in both intrafacility and interfacility communication. Fragmented communication and interprofessional power dynamics were identified barriers to optimal antibiotic prescribing for UTIs. Identified strategies to overcome these issues included using objective diagnostic criteria, development of communication scripts, and nurse-to-nurse education.

Conclusions: Our qualitative approach revealed important insights about how communication and relationship dynamics influence UTI diagnosis and optimal antibiotic stewardship for LTCF residents evaluated in the ED. Future interventions should strengthen communications between settings and across provider types, and address standardization of diagnostic and treatment communication pathways for LTCF residents with suspected infections transitioning between EDs and LTCFs.

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For long-term care residents, urinary tract infections (UTI) are some of the most commonly diagnosed infections in both long-term care facilities (LTCF), and the emergency department (ED),^{1,2} as well as a major contributor to inappropriate antibiotic use.³ Increased

prevalence of asymptomatic bacteriuria, medical comorbidities, and cognitive impairments in the geriatric patient population are barriers to appropriate diagnosis and treatment of UTIs.^{4,5} While many antibiotics for UTIs are given to patients with symptoms, a significant number of antibiotics for UTIs are given for asymptomatic bacteriuria in nursing homes.⁶ Asymptomatic bacteriuria has a point prevalence range between 20% and 50% in LTCFs.⁷ Altered mental status, malaise, and lethargy do not increase the probability of infection in older adults in the ED.⁸ Despite long-established understanding of the lack of association between these statuses and infection in older adults,⁹ a culture of interpreting any change of condition in older adults as an underlying infection still persists in the current generation of providers and caregivers.¹⁰ In fact, urinalyses (UAs) are not just

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ineffective for this population—they contribute to antibiotic overprescribing.¹¹

The number of LTCF residents with complex health care issues is rising,¹² and LTCF residents with suspected infections often are referred to the ED.¹³ The effects of misdiagnoses and inappropriate antibiotic use can extend beyond a single organization, affecting the risk of bacterial resistance in facilities and individuals throughout both the health care system and the local community.¹⁴ Time pressures, incomplete information, poor knowledge of constantly updating diagnostic and treatment guidelines, facility-level policies, and federal guidelines all can influence antibiotic prescribing decisions in the ED.¹⁵ Additionally, interconnected psychological and behavioral factors drive UTI misdiagnosis in the ED.^{15,16} In LTCFs, antibiotic prescribing is influenced by many social and contextual factors, including nursing pressure, nursing gatekeeping, and family satisfaction.¹⁷ Similarly, the CDC's Core Elements of Antibiotic Stewardship for Nursing Homes calls for leadership, accountability, and regular interpersonal feedback in addition to changes in diagnostic techniques and prescribing policies.¹⁸ Building rapport and personal relationships over time to gain the trust of the local clinicians has been recognized as an important component of successful antibiotic stewardship programs,¹⁹ and local organizational culture is an important informer of prescriptions in LTCFs.²⁰ In addition to localized effects, LTCF residents who are treated in the ED are likely subject to combinatorial effects resulting from the interactions between the 2 organizations, but these effects that have not been well documented.

Nurses in particular have been identified as critical stewards of antibiotics due to the personal interactions they have with patients, families, physicians, and other nurses. Research has shown how nurses often act as central communicators, coordinators of care, and monitors of patient status, but nurses are also the operational and communications hub for the antibiotic therapy process.^{21,22} In some facilities, the decision-making of nursing staff surrounding UTIs is integral to antibiotic prescription and de-escalation, in both nursing homes²¹ and LTCFs.^{17,22} It has been suggested that effective communication between nurses and physicians and increasing confidence through education and decision support mechanisms can lead to better antibiotic stewardship outcomes.²³ A study of nurses in Japan found that strict hierarchies, age-based seniority, a perception of having limited knowledge and experience, and concerns about offending a colleague or causing team disharmony were barriers to assertive communication.²⁴

Previous research has called for a focus on infection preventionist and nurse involvement in antibiotic stewardship to identify barriers and facilitators, and craft richer illustrations of their roles, responsibilities, and expectations across different settings.²⁵ The prevalence of inappropriate antibiotic use in the LTCF has been estimated in various locations in the United States to be between 25% and 75%.^{6,26-28} The transition to and from the ED, where antibiotics might be prescribed, is an area that is especially prone to inappropriate antibiotic use.²⁹ Therefore, the goal of this qualitative study was to enhance understanding of how nursing communication and relationship dynamics affect how LTCF residents are treated in the ED, and identify barriers to optimal antibiotic stewardship throughout a frequent transition of care (LTCF to the ED and back) in this high-risk population.

METHODS

Sampling

We conducted semi-structured interviews with LTCF and ED staff members from June 2017 to August 2019. Participants were eligible to participate if they were currently working in an LTCF or ED setting.

To recruit participants from local LTCFs, a signup sheet was passed around at 2 meetings hosted by the local Skilled Nursing Facility Acute Care Coalition and the Wisconsin Healthcare-Associated Infections in Long-Term Care Coalition. Potential LTCF participants were selected through purposeful criterion sampling. While we did not have a prespecified number of participants needed per category, we specifically invited interested individuals to participate based on region in Wisconsin, setting (metro vs nonmetro), years of experience, and size of facility. In this way, we attempted to interview participants representing a range of demographic and setting characteristics. To recruit participants from EDs, the principal investigator sent email invites to groups of emergency physicians and nurses. The sample of ED participants was a convenience sample; however, we did include participants from different types of EDs (eg, academic vs community, high vs low volume) with varying levels of clinical experience. We proceeded with sampling, data collection and preliminary data analysis concurrently and stopped data collection once participant responses became redundant, attempts to uncover new themes failed to reveal novel data and the study team deemed data saturation had been reached.³⁰ All participants received between \$50–100 in appreciation of their time commensurate with their role and estimated hourly wage.

Data collection

We developed a semi-structured interview guide comprised of open-ended questions and structured items informed by the Systems Engineering Initiative for Patient Safety (SEIPS) model.^{31,32} The SEIPS model was selected as it was designed to capture all elements of a health care work system or process that can impact quality and safety outcomes. Open-ended questions were always asked prior to any structured, SEIPS informed items to encourage participants to speak freely and elaborate on expressed ideas. The semi-structured interview guide was similar for all participants; however, we adapted it slightly to be relevant to the participant's role and setting and a sample (LTCF nurse guide) is included in supplemental material. The interviews were conducted in a private office or conference room. According to participant preference, half of the interviews occurred at the participant's office and the other half were conducted at the authors' departmental offices. The second author, a nonclinical study team member with qualitative research expertise, conducted all of the interviews. The senior author, an emergency physician, attended 3 of the early interviews to observe, for the purpose of developing additional clarifying questions for the interview guides. All participants gave verbal consent to participate. Interviews were audio recorded and lasted an average of 60 minutes. Audio files were transcribed verbatim by a professional transcription company and reviewed for accuracy by study team members. The study was deemed exempt by the local Health Sciences Institutional Review Board as we were not collecting identifiable information.

Demographic information was collected from the participants at the time of the interview, specifically regarding the county or counties where participants primarily worked, years of experience, and gender. Counties were grouped into the 1 of 5 regions in Wisconsin—Northeastern, Northern, Southeastern, Southern, Western.³³ We classified counties according to the Economic Research Services' 2013 Rural-Urban Continuum Codes.³⁴ This scheme divides counties into metropolitan (metro) or nonmetro areas and then further divides the nonmetro counties by urban population (20,000 or greater; 2,5000 to 19,999; or less than 2,5000). In Wisconsin approximately 27% of the population is classified as nonmetro and 73% is classified as metro.³⁴ We asked LTCF staff how many beds their facility had and the levels of care offered in their facility (independent care, assisted living, and skilled nursing). We asked the ED staff their annual volume and if they primarily worked in an academic center or community setting.

Data analysis

While the SEIPS model was used to ensure a comprehensive coverage of health care work system elements were included in our interviews, this model did not guide this analysis. Instead, a preliminary codebook based on domains of the interview questions and emerging domains was developed. Interview data were iteratively, deductively and inductively coded using conventional content analysis.³⁵ Coding was performed via Dedoose.³⁶ Two study members coded each interview and then meet to reconcile any differences. During consensus meetings, each coder explained why they coded a segment of text in a certain way. We based our final coding decision on the subsequent discussion. After the initial coding of one or 2 interviews, the entire research team would convene and discuss any additions, consolidations, or edits to the codebook. To ensure consistency in coding across all interviews, whenever a new code was added or a coding definition was updated, all previously coded interviews were reviewed and the new and updated codes were incorporated appropriately. Memos were used to track how code definitions evolved and to capture reactions while coding. This pattern of coding and reviewing was used for the duration of the coding process. We utilized 4 phases to develop themes, initialization, construction, rectification and finalization, taking into account both intensity (frequency) and saliency of potential themes during the consensus meetings.³⁷ We presented and reviewed key findings from our study to the UW Skilled Nursing Facility Acute Care Coalition meetings to learn if the themes that emerged from our work were consistent with and reflective of the Coalition members' experiences. The group consensus was that our identified themes accurately reflected their perspectives.

RESULTS

We conducted interviews with 32 staff members of LTCFs and EDs, including LTCF nurses (12, including floor nurses, nurses in leadership, or nurses holding specialized positions), LTCF medical directors (4), ED nurses (6, including care team leaders and floor nurses), and emergency physicians (10) Summary characteristics for participants and their settings are displayed in [Table 1](#).

In the next section, we describe the findings about the importance of communication in transitions of care, the critical role that ED and LTCF nurses have in communicating within their own health care team and with health care providers in other settings. We describe how these communication dynamics play out during the diagnostic and treatment process for UTIs and the strategies that LTCFs have implemented to promote effective communication across settings. [Table 2](#) highlights the broad themes around communication and [Table 3](#) highlights the strategies LTCFs utilized to enhance communication and optimal antibiotic stewardship for UTIs. In [Tables 2](#) and [3](#) each quote is given an ID number (Q1-Q28). In the results that follow, we reference this ID number when a quote corresponds to the segment of text we are discussing.

Importance of communication in transitions of care

Even though specific facilitators and barriers for communication varied, both LTCF and ED staff noted a need for improved communication for the benefit of LTCF residents who transition from the LTCF to the ED and back. Participants described a lack of clarity and reliability in current communication practices. They commented how this type of communication does a disservice to their patients and recognized opportunities to ameliorate this issue (Q1).

Role of nurses in communicating patient status

Nurses are often heavily involved in patient assessments and drive care through their communication with providers in both care settings. Both LTCF and ED staff recognized that nurse communication has a critical role in both diagnosis and antibiotic utilization. Though providers have the final responsibility for diagnosis and prescribing decisions, providers often rely on the information collected (eg, history and urine testing), interpreted, and delivered by the nurses to make those decisions. This is especially true in situations where the providers have not seen the patient, or have limited time for interaction (Q2 and Q3). The ED nurses also have a frontline role specifically in identifying UTI infections (Q4).

Communication dynamics within health care settings

Within the ED, nurses routinely communicate with physicians before sending a UA, but sometimes UAs, and other tests or procedures, are sent without prior nurse-physician communication. Emergency physicians described trust in the ED nurses' decisions and approval over current ED nurse autonomy (Q5, Q6, and Q7).

In contrast, LTCF nurses are required to report changes of conditions to primary care physicians (PCP) within prespecified time frames. LTCF nurses described balancing the need to report changes in condition while also ensuring UAs were ordered appropriately by requiring nurses to contact the physician or confirm with their manager prior to ordering a UA (Q8 and Q9).

Communication dynamics across health care settings

Both LTCF and ED nurses were often frustrated with the process of trying to communicate across settings. The communication across health care teams occurs primarily through phone communications if it happens at all. The LTCF staff described infrequently receiving a call from the ED staff about returning patients (Q10).

The ED nurses were similarly frustrated with the communication process because sometimes when they tried to call report it was difficult to identify and/or reach the nurse who was going to be receiving the patient upon transfer back to the LTCF (Q11). While many LTCF and ED nurses expressed frustrations with communication, LTCF nurses who worked in nonmetro areas had fewer communication issues due to increased familiarity with the providers. They described how because they worked in a small setting everyone routinely worked with each other, which promoted increased trust and willingness to listen to each other (Q12). Emergency physicians described how LTCF nurses had a tendency to be deferential or nervous when talking to them, and suggested that it might be because of the power dynamic between the positions (Q13). LTCF Directors of Nursing also acknowledge this power dynamic and said it did not just apply to emergency physicians but all physicians with whom the nurses interacted, and it was more common in less experienced nurses (Q14).

Communication challenges in the context of UTI diagnosis and treatment

In this patient population, asymptomatic bacteriuria is common, causing UTI prevalence to appear higher if diagnosis relies solely on UA results. LTCF staff described questioning the frequency and accuracy of UTI diagnosis and antibiotic utilization for residents treated in the ED (Q15 and Q16).

When LTCF nurses and infection preventionists encounter ED-prescribed antibiotics that they believe are inappropriate, they have to communicate with the resident's PCP to request de-escalation. LTCF staff described encountering significant relationship barriers when communicating with physicians about deescalating an antibiotic that was prescribed by a different provider. LTCF staff described

Table 1
Characteristics of participants and participants' practice settings

Participant characteristics	Overall(n = 32)		LTCF staff(n = 16)		ED staff(n = 16)	
	n	%	n	%	n	%
Female	22	69	15	94	7	44
# Years' experience						
1-3	3	9	3	19	0	0
4-6	9	28	1	6	8	50
7-10	3	9	1	6	2	13
10-20	10	31	8	50	2	13
20-30	2	6	1	6	1	6
30 +	5	16	2	13	3	19
Roles/Titles						
Emergency Dept. Care Team Leader	4	13	-	-	4	25
Emergency Dept. Nurse	2	6	-	-	2	13
Emergency Dept. Physician	10	31	-	-	10	63
LTCF Administrator	1	3	1	6	-	-
LTCF Assistant Director of Nursing	1	3	1	6	-	-
LTCF Director of Nursing	4	13	4	25	-	-
LTCF Floor Nurse	11	34	11	69	-	-
LTCF Infection Preventionist	8	25	8	50	-	-
LTCF Medical Director	4	13	4	25	-	-
Setting Characteristics						
Average Number of Beds						
0-49	-	-	2	13	-	-
50-99	-	-	5	31	-	-
100-149	-	-	5	31	-	-
150-200	-	-	2	13	-	-
200+	-	-	2	13	-	-
Levels of care*						
Independent care	-	-	6	37.5	-	-
Assisted living facility	-	-	9	56.3	-	-
Skilled nursing facility	-	-	16	100	-	-
Annual ED volume*						
<10,000	-	-	-	-	5	31
10,001-20,000	-	-	-	-	9	56
20,001-30,000	-	-	-	-	1	6
30,001-40,000	-	-	-	-	1	6
40,001-50,000	-	-	-	-	2	13
50,001-60,000	-	-	-	-	1	6
60,001-70,000	-	-	-	-	8	50
Primary setting of practice						
Academic medical center	-	-	-	-	7	44
Community hospital	-	-	-	-	9	56
Setting*						
Metro	24	75	7	44	16	100
Nonmetro; 20,000 or greater	5	16	4	25	1	6
Nonmetro; 2,500 to 19,999	4	13	4	25	0	0
Nonmetro less than 2,500	1	3	1	6	0	0
Region of Wisconsin						
Northeastern	3	9	2	13	1	6
Northern	1	3	1	6	0	0
Southeastern	7	22	5	31	2	13
Southern	19	59	6	37.5	13	81
Western	2	6	2	13	0	0

*Participants working in >1 facility were captured in multiple categories.

that despite their best efforts to educate providers, they often faced barriers to achieving appropriate de-escalation (Q17 and Q18).

Likewise, there were situations where physicians seemed to need confirmation from nurses in order to accept nurses' suggestions for best practice. LTCF staff described how word choice and communication style when providing feedback to PCPs had an effect on physician's decisions, including decisions to send a resident to the ED or to agree to deescalate antibiotics (Q19 and Q20).

Strategies for promoting interprofessional communication

Reflecting the barriers to effective communication, improving this is an overt area of focus in many facilities. Facilities have developed

scripts to help nurses discuss patient assessments, diagnostic criteria and antibiotic prescribing decisions, including feedback on appropriateness, with physicians in real-time as opposed to a report card from the medical director once a year (Q21).

The scripts and tools used in these facilities have specifically helped nurses communicate effectively about ordering UAs and concerns regarding antibiotic prescriptions that are inconsistent with facility practice guidelines (Q22 and Q23).

The informal, on-site education between health care professionals can be powerful tools in improving interpersonal communication, especially for those encountering and challenging power dynamics. LTCF nurses described the positive impact of nurse-to-nurse education on how to confidently speak to physicians regarding antibiotic

Table 2
Themes and exemplar quotes of importance of communication, roles, within and across teams and challenges specific to UTI diagnosis and treatment

Theme	Exemplar quote
Importance of communication in transitions of care	Q1: The communication is very fragmented, not only at this nursing home, everywhere. And so the way that the change of condition is communicated, the way that who knows about it, right, in this case there was also a nurse supervisor onsite that should have known about that and should have, you know, been involved. And so there are a lot of opportunities, if you will, to make sure that, you know, we're right on top of these change of conditions as they happen. (LTCF Medical Director, 116)
Role of nurses in communicating patient status	Q2. Your physicians aren't coming in to see them. I mean, they're really basing their knowledge off of what the nurses are giving them. (LTCF Infection Preventionist, 104) Q3. The other piece is having the engagement of the nursing staff, right, because, again, it's coming down to that communication piece of collecting the data. They're really the first line, you know, of information for the providers on call and even onsite. (LTCF Medical Director, 116) Q4. When the UA comes back, if I see white blood cells, positive leukocytes, positive bacteria, sometimes blood in the urine, then I'll go up to the physician and say, oh, I notice UA is back, and they have quite a few white cells, you know what I mean. So I will never diagnosis it, but I will certainly let the physician know that I've seen it come back, and it looks suspicious." (ED Nurse, 204)
Communication dynamics within health care settings	Q5. Most of the time they ask, 'hey, do you want a UA', before they order it for me. 95 percent of the time, they'll ask me before they do it. (ED Physician, 103) Q6. I think our charge nurse does a good job of letting us know if they feel we need to know about something in advance. The nurses will kind of prioritize appropriately. (ED Physician, 106) Q7. Emergency nurses, because of the nature of how we work and what we do, they're allowed to do certain things and get things going, which is often very helpful. (ED Physician, 104) Q8. And then before they want to get a UA, anything like that, they also have to call me... because I have been noticing like, well, these people don't have 3 symptoms, you know, and then they wanted to dip them, and I don't believe in that, and it's just, they're always going to have [a UTI]. They're always going to have one. So now, [the nurses] are getting pretty good about calling me to see if they need to get a UA. (Director of Nursing, 103) Q9. You know, if I called [the PCP], they're probably going to you know, order a urine. I try to encourage them [the nurse] if the resident is not acutely ill, but they have some change in their baseline, and it's a urine thing, to monitor 24 hours, push fluids give cranberry juice, all of those things that we can do here before we need to call a doctor. (Infection Preventionist, 109)
Communication dynamics across health care settings	Q10. And we get usually nothing. Every now and then, I'll get a great [ED] nurse, you know that calls me and says, this is what happened. This is what we did. And that's wonderful because then we know how to move forward because otherwise, it's just a guessing game. You know, I'll come in in the morning. Like they came back. Okay, What did they say? I don't know. We didn't get anything. Really? Nothing? So then I'll call. (Director of Nursing, 103) Q11. So you don't know who you're calling to report to. So if they don't give you the number of who to call back to, it's very difficult sometimes, especially with these bigger organizations to try to his somebody's who's actually going to follow up with them. (ED Nurse, 201) Q12. We don't have a lot of challenges with our hospital, because we're so close to all of the providers, the, you know, our medical director, and even having a meeting with the discharge planners of the hospital, they know us all by name... You work with the same providers. You know [physician] was a physician here for like 50 years, and he rounded at this facility for like 50 years. So they know everybody here, you know what I mean? And even our nurses, like I have a nurse that was a nurse for 54 years, 54 years. They all know her, you know what I mean?... But there's a certain level of trust and understanding and willingness to adapt what you usually do because you're in a small setting. Like this certainly would not work every place, because I am sure that not every place, you can literally walk into an ER and get care. (LTCF Director of Nursing 111) Q13. Occasionally, when you make that call [to send the patient back to the LTCF], [LTCF nurses are] surprised. Most of the time, they're fairly accepting. They'll say, 'sure,' and maybe that's that deference. They're just the random faceless person on the phone, and you're the physician, and so they're not going to argue with you. It would be nice sometimes if they did, if they really had a big concern, say, 'this is not going to work,' that they would push back. (ED Physician, 104) Q14. You get a new nurse in here that has to call a physician, and it's only the third time she's called a physician, and the last 2 times she called a physician, he yelled at her because she didn't have her assessment in line, she's going to be meek. And it's very difficult to be meek when you're calling a physician, because you're working as an advocate. (LTCF Director of Nursing, 111)
Communication challenges in the context of UTI diagnosis and treatment	Q15. I've talked across the state about this topic mostly to long-term care nurse audiences. Every place I talk, they ask this question. Why do [patients] always come back [from the ED] with an antibiotic for a diagnosis of urinary tract infection? (LTCF Medical Director, 113) Q16. I don't know that they understand as we now know, and I don't mean to belittle, but this whole idea of antibiotic use, how badly we want to avoid putting our people on antibiotics because they are so at risk for the side effects... So, you know, we want to make certain that the right diagnosis is given, and they're not treated for something partially for those reasons, but partially because then they miss the real diagnosis. (LTCF Director of Nursing, 111) Q17. So 2 days later, the culture comes back, 8,000 colonies of <i>E. coli</i> , which is an insignificant urine culture. The nurse calls back and says, "Doctor, the culture comes back negative. May we stop the antibiotic?" And he said, "How is the resident doing?" And the nurse said, "Well, he's doing fine." He said, "Well, I'd like you to continue the antibiotic for ten days." And she said, "Okay, but that does not satisfy our facility best practice criteria. Why do you want to do that? Why do you want to continue the antibiotic?" And he said, "Because I'm the doctor." (LTCF Medical Director, 113) Q18. I talked to [the emergency department], and I did everything in my power. I sent them the evidence. I sent them the revised McGeer's Criteria. I sent them the FDA recommendations regarding fluoroquinolone use. I sent them her creatinine function that shows that she's a candidate for nitrofurantoin. I sent them the UA that showed <i>E. coli</i> with all the sensitivities. I sent them all of this stuff, and I'm still not successful. (LTCF Director of Nursing, 111) Q19. I feel like I present things a little bit differently than some people do, because I think that a lot of the time, the physician needs me to tell them it's okay that we don't send them over [to the ED]. And I will literally say those words. (LTCF Director of Nursing, 111) Q20. Because I think sometimes, we just say, oh I'm calling, and they have a fever and they're complaining of burning. And [the nurse] doesn't say anything else. And I think a lot of doctors will just jump on, let's start an antibiotic, versus, but they're still up and we can still encourage fluids. We could, you know, and things like that. So the conversation is a huge piece, that I'm trying to get my nurses is painting the picture for the physicians." (Infection Preventionist, 109)

Table 3
Strategies with exemplar quotes that LTCF staff utilize to promote interprofessional communication

Strategy	Exemplar quote
Communication scripts	Q21. The nurses' feedback is much, much more important than mine, because they do it every day. And in the cascade of what happens in antibiotic stewardship program, the nurses themselves are given feedback on how they communicate, because we have very specific, we use very specific communication scripts. (LTCF Medical Director, 113)
Forms for diagnosis of UTIs	Q22. So we have 2 different forms, to be very obvious. This way, the physician doesn't get the wrong idea of what we want. One form says, we evaluated for urinary tract symptoms because of, you know, because of concerns from family, or because of concerns from staff. The following urinary symptoms were found. And then just, you know, there's your McGeer's Criteria, so you can check, you're following urinary symptoms. And then right below that, it says, these symptoms do not meet McGeer's Criteria for urinary tract infection. We recommend watching and pushing fluids. (Director of Nursing, 111)
Facility best practice criteria	Q23. The other feedback that nobody talks about in the literature that I've seen is the communication that the nurse does to the physician about the resident change of condition. Our nurses are encouraged to question the physician about the things they are doing, . . . If the doctor wants to get a urine culture to start antibiotic before even the urine culture comes back out, the nurse might say, 'doctor, this resident doesn't have clinical criteria that I can find that satisfies our facility best practice criteria.' (LTCF Medical Director, 113)
Nurse-to-nurse education on communication with physicians	Q24. The conversation is the huge piece that I'm trying to get to my nurses is painting the picture for the physician, the things that the patient is exhibiting and then also the things that have not changed, that they're still doing well. And then encouraging them, you know, if they do choose to say, 'well, let's send them over for [ED] evaluation,' asking them, 'you know, what are we wanting [the ED] to evaluate?' You know, if it's just, if we're gonna go over there, and they're going to draw labs and test their stool or, you know, can we do that here? Or if they just need, you know, hydration, if they just need fluids, we can put an IV in here, and we can, you know, we can start fluids. We can start blood draws. And it's just building the confidence of our nurses. (LTCF Infection Preventionist, 109)
Educating the physician	Q25. The mindset of nurses sometimes is if the doctor's giving an antibiotic well then the doctor's found what's wrong with them and they're taking care of the patient and why should I question anymore. (LTCF Infection Preventionist, 104) Q26. The education piece of the nurses is to help them understand, so they know how to educate the doctors. Like if we get a new doctor onboard, or we're calling an on-call doctor, as long as they can present it in the correct way, then there's usually no problems. (LTCF Infection Preventionist, 112)
Developing trust through on site in services	Q27. Oftentimes, I will have one-on-one in services with the nursing staff on the floor, to talk about developing this antibiotic stewardship program. I'll talk to them about identifying signs and symptoms of UTI. (LTCF Medical Director, 116)
Supportive and present medical director	Q28. I think if you don't have a supportive medical director that can help your nurses, you're going to see more ED visits. You're going to see more hospitalizations that are perhaps unnecessary. (LTCF Director of Nursing, 110)

de-escalation and the decision to send a patient for an ED evaluation (Q24, Q25, and Q26).

Developing trust within and across health care teams through a pattern of regular communication and longitudinal relationships can help improve coordination and standardization of care. LTCF nurses and medical directors described how their relationships with each other can improve antibiotic stewardship and ED utilization patterns (Q27 and Q28).

DISCUSSION

To our knowledge, this work represents the first qualitative analysis exploring how health care provider communication and relationship dynamics specifically impact antibiotic prescribing for UTIs in LTCF patients treated in the ED. Overall, this qualitative work identified several key themes that influence antibiotic prescribing for patients as they transition from LTCFs to the ED and back again. Consistent with previous literature, both ED and LTCF workers felt that communication between settings was often difficult or fragmented.³⁸ They went on to acknowledge that clear communication across settings and between provider types is critically important given the important role that nurses have in decision making surrounding management of infections. Participants also highlighted the importance of relationship dynamics between nurses and physicians across settings. Power dynamics were somewhat challenging and created barriers to appropriate UTI assessments and antibiotic use. However, we also heard how over time, many health care teams developed trust across provider types and across settings, which was a positive relationship dynamic. Some participants felt that clear communication was so important that they developed dedicated structures and strategies, including communication scripts and trainings, that helped them promote good communication.

Even though both LTCF and ED staff recognized that nurses' communication had a role in UTI diagnosis, the 2 sides differed in how they understood and pursued appropriate urine testing. Emergency physicians described trusting the decision-making of the ED nurses to order a UA for geriatric patients. LTCF nurses, especially those that

were infection preventionists, described having to advocate strongly for a decrease in urine testing, especially when the patient was sent to the ED for reasons unrelated to a UTI. They felt that a positive UA would routinely result in unnecessary antibiotics even if the patient was asymptomatic. This is surprising given the fact that older adults in LTCFs are predisposed to asymptomatic bacteriuria, which does not require antibiotic therapy. LTCF nurses have specialized knowledge of the particular risks and side effects that unnecessary antibiotics have on their older adult residents. In contrast, ED staff work with all age groups and may be less directly familiar with the risks that unnecessary antibiotics pose to this patient population. It is possible that cooperative training and care pathways that include both settings could help improve understanding and standardize care.

Relationships and power dynamics between nurses and physicians have been explored often in the literature and are an established phenomenon.^{39,40} Our results show that these dynamics have the potential to negatively impact relationships surrounding antibiotic stewardship. If a prescriber is not willing to listen to another provider who is acting as an antibiotic steward, then all of the surveillance, education, and diagnostic evidence gathering that leads up to that interaction becomes futile. The development of trusting relationships and shared understanding of the best approach for the patient facilitate antibiotic stewardship. It could be that by keeping the patient at the center of the conversation, health care professionals may be able to overcome some of the challenging power dynamics that have historically existed in medicine.

Perhaps the most illuminating result was regarding the impact of nurse-to-nurse education on how to speak to physicians about de-escalating antibiotics. LTCF nurses indicated that often patients return from the ED with antibiotics prescribed for UTI that do not meet clear LTCF criteria to justify treatment. This is consistent with previous studies which have found that antibiotics for UTIs initiated outside of the facility are significantly more likely to be inappropriate than those initiated within the facility.²⁹ In these situations, LTCF nurses were required to reach out to the patient's PCP, leading to challenging conversations that did not always yield de-escalation. Therefore, LTCF nurses developed specific strategies such as referring to objective

diagnostic criteria (eg, McGeer's), standardized conversation scripts and informal nurse-to-nurse education sessions to ensure that conversations with providers about de-escalation or antibiotic termination are clear, and promote appropriate antibiotic use. Disseminating these techniques more broadly would produce short term gains in antibiotic stewardship but also facilitate longer term behavior change in support of sustainable antibiotic stewardship.⁴¹

The 2017 CMS requirement required the development of antibiotic stewardship programs in LTCF. This requirement gave more social responsibility and autonomy to nursing staff, as the process for initiation and de-escalation involves interpersonal communication with nurses and physicians from other facilities about both facts and personal judgments. However, a recent study of 316 nurses from 3 hospitals found that while 95% believed in antibiotic stewardship interventions, 52% were not familiar with the term "antibiotic stewardship" and only 39.6% indicated that antibiotic stewardship programs were moderately or extremely important in their health care setting.⁴² Promoting antibiotic stewardship education for nurses, in both content and communication, would be a key step toward more appropriate antibiotic usage in EDs and LTCFs.

In our sample, many infection preventionists and nurses took on informal antibiotic steward roles, but given the increased workload, the common issue of turnover, and the time it takes to build trusting relationships, a suggestion for improvement could be to establish a dedicated antibiotic steward nurse position for each facility. A distinct antibiotic steward nurse role could include development of standardized assessment pathways (eg, urine testing criteria) and formal communication training for conversations about antibiotic justification (eg, diagnostic criteria) and de-escalation. Physicians might be more responsive and willing to engage with someone with more specific titling and training. The training efforts described by many interviewees could be focused on a single position, instead of on many. Such a role might reflect a realization from the evaluation of the Missouri Quality Initiative, where researchers noted the importance of communication between care providers and settings. They identified the positive impact of a specific role responsible for working with both nursing homes and hospitals that improved the bidirectional exchange of information.⁴³

Our study population uniquely included many individuals who frequently interacted with both ED and LTCF settings, including infection preventionists, medical directors, and nurses, the vast majority of whom brought up the effects of communication in their work. Infection preventionists in particular have been noted for their increasing participation and leadership in antimicrobial stewardship programs.⁴⁴ While an ideal world would see every individual quickly develop positive relationships with every member in their health system to facilitate that communication, relationship-building is often more challenging with high rates of staff turnover. Effective communication continues to be a critical component of high-quality health care delivery. The COVID-19 era has highlighted the differential effects that fragmented communication can have during transitions of care.⁴⁵ Warm handoffs between hospital and skilled nursing facility clinicians could be one way to improve inter-facility communication⁴⁶ and overall care for LTCF residents.

This manuscript has several limitations that are important to highlight. First, it would have been helpful to obtain the perspectives of emergency medical services, family members, and patients to holistically enhance our understanding of how other channels of communication individually and together impact antibiotic decisions for LTCF patients evaluated in the ED. This paper focused on professional relationships and communications involving nurses and physicians, who are both primary communicators in the LTCF-ED transition, but our research also began to note the influence that these other groups had in how tests were ordered and antibiotics were prescribed. The use of voluntary sampling may have led to

sampling bias through self-selection, influencing the production of a sample population possessing stronger positive or negative comments about the subject matter compared to those who did not feel motivated to volunteer. Additionally, this study contained 3 interviews that were conducted by 2 researchers, one of which is a current emergency medicine physician and promoter of antibiotic stewardship, potentially limiting the depth of conversations and the open expression of the interviewee in those 3 interviews. Finally, this research was done with health care providers in Wisconsin, the results may not be transferable to populations in other states with different demographic profiles or metro/nonmetro distributions.

CONCLUSIONS

Communication and relationship dynamics influence UTI diagnosis and antibiotic utilization in the high risk, yet understudied population of older adults residing in LTCFs evaluated in the ED. Our qualitative approach, which included perspectives from both LTCF and ED providers, revealed important insights about how communication and relationship dynamics within and across settings can influence optimal antibiotic stewardship. Infection preventionists and other LTCF staff may want to consider incorporating the strategies highlighted by their peers to promote interprofessional communication in support of improved process around the diagnosis and antibiotic treatment of UTIs. Future interventions should focus on improving communication between settings and across provider types, and address standardized diagnosis and treatment pathways for LTCF residents with suspected UTIs who transition between ED and LTCF settings.

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