

A Multidisciplinary Team Approach to Antibiotic Stewardship: Gathering and using data

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How do you decide where to start?

- Start small; core elements recommend you focus on one thing at a time
- Use data to help decide where to intervene first – data may come from multiple sources like pharmacy, quality, nursing, labs etc.
- Must decide what scope of intervention is possible based on your staffing, medical record system, availability of an in-house pharmacist, relationship with the microbiology lab etc.

You Can't Do it Alone

- Who should be on your team?
- What do your team members need to be effective?
- Involve multiple people from the beginning to account for turn-over and other commitments

Team Members may Include:

- Internal Members:
 - Medical Director
 - Infection Preventionist: with dedicated time to collect data; difficult to engage staff with multiple jobs and priorities
 - Consultant pharmacist/in house dispensing pharmacist
 - DON
 - Nurse managers and educator
 - Nurse practitioner/physician assistant
 - Information Technology (IT)
- External Members:
 - Hospital-based pharmacists/physicians

Ways to Gather Facility-Wide Antibiotic Data

- **Medication Administration data**
 - Often not available electronically
- **Purchasing data**
 - Different from hospital as medications purchased in bulk
 - Can be difficult for dispensing from a central pharmacy location to many facilities
- **Dispensing data**
 - Does not insure the antibiotic was administered
 - Often the dispensing pharmacy is outside the facility
- **Manual collection**
 - Point prevalence
 - Antibiotic start

With many resources....

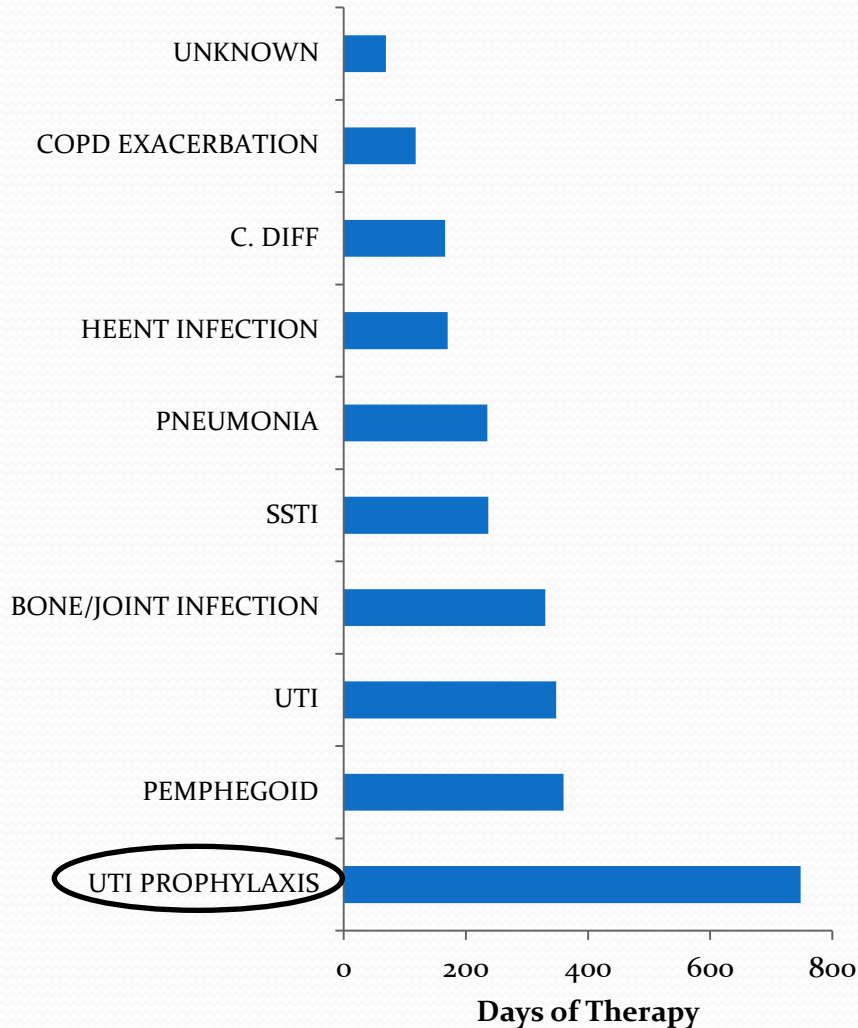
- You can obtain antibiotic dispensing data to get a complete picture of where to intervene:
 - May be obtained from in-house or dispensing pharmacies
 - Useful variables to ask for:
 - Unique number for each patient
 - Drug name and dose
 - Complete “Sig” (contains indication)
 - Start and end dates
 - Days of Therapy (DOT)

Summaries of Antibiotic Data will Determine Interventions

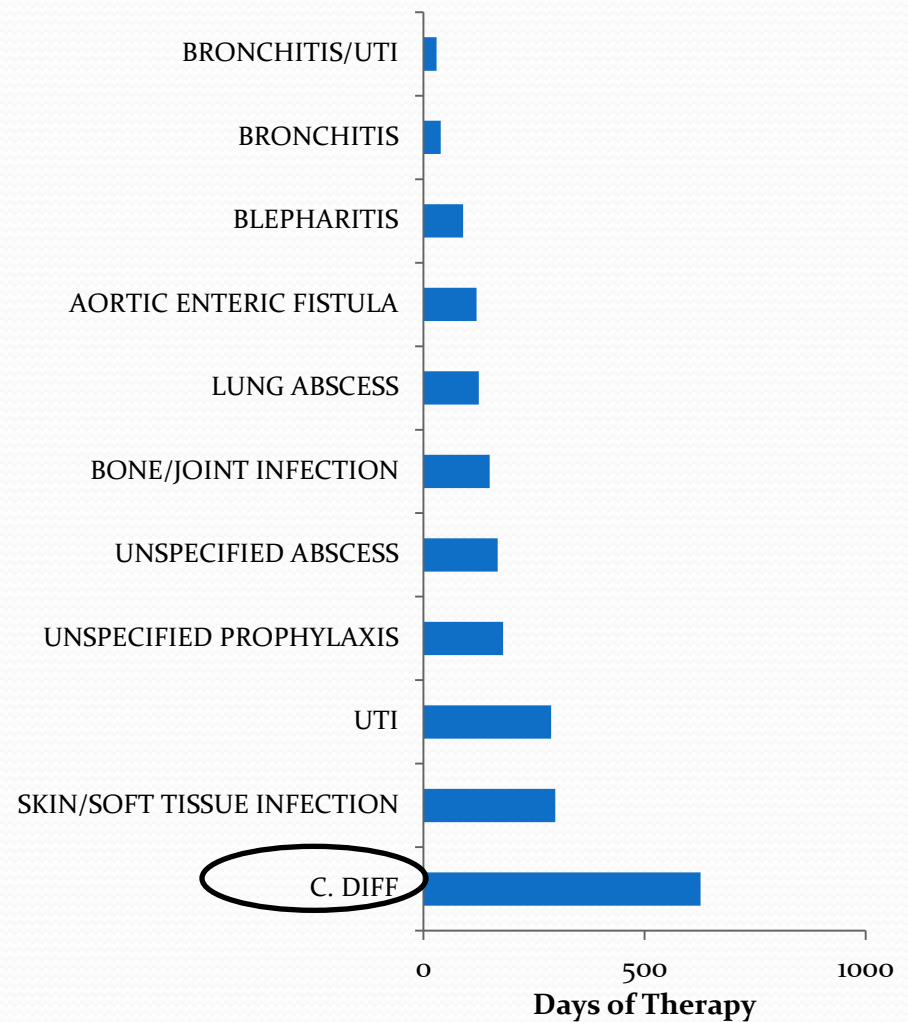
Summary Data	Use
DOT by time period	<ul style="list-style-type: none">• Gross amount of antibiotics in the facility• Monitor progress over time
DOT by Indication	<ul style="list-style-type: none">• Most common indications for which antibiotics are dispensed
DOT by Agent	<ul style="list-style-type: none">• Shows most common antibiotic agents
Indication by number of residents	<ul style="list-style-type: none">• Shows what most residents are being treated for• Does not account for duration of therapy
Antibiotic Starts by Indication	<ul style="list-style-type: none">• Shows how many residents are started on therapy for a new instance of an infection• Commonly used in nursing homes to track antibiotic data

Examples – Antibiotic DOT by Indication

Nursing Home 1 – Quarter 3

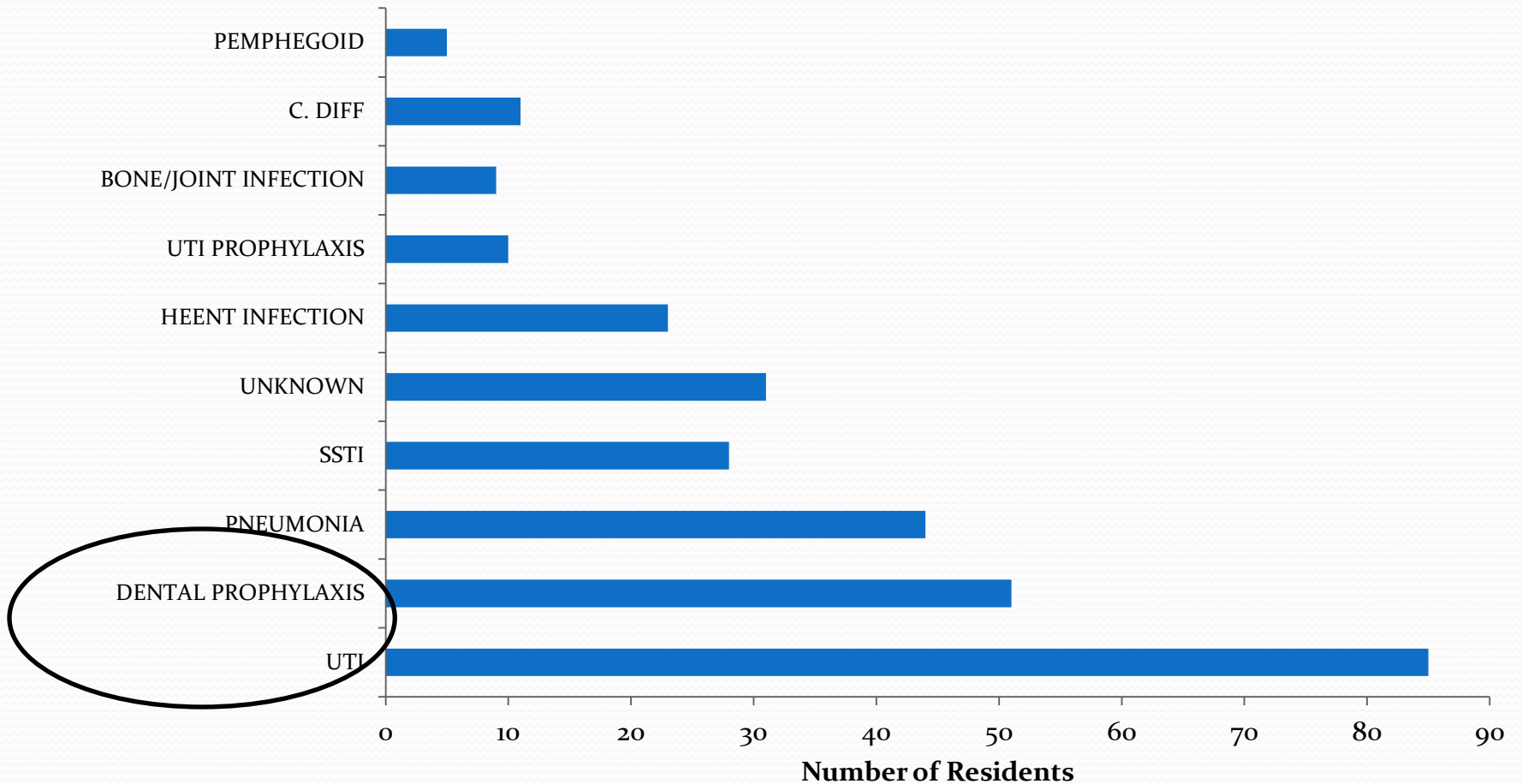


Nursing Home 2 – Quarter 3



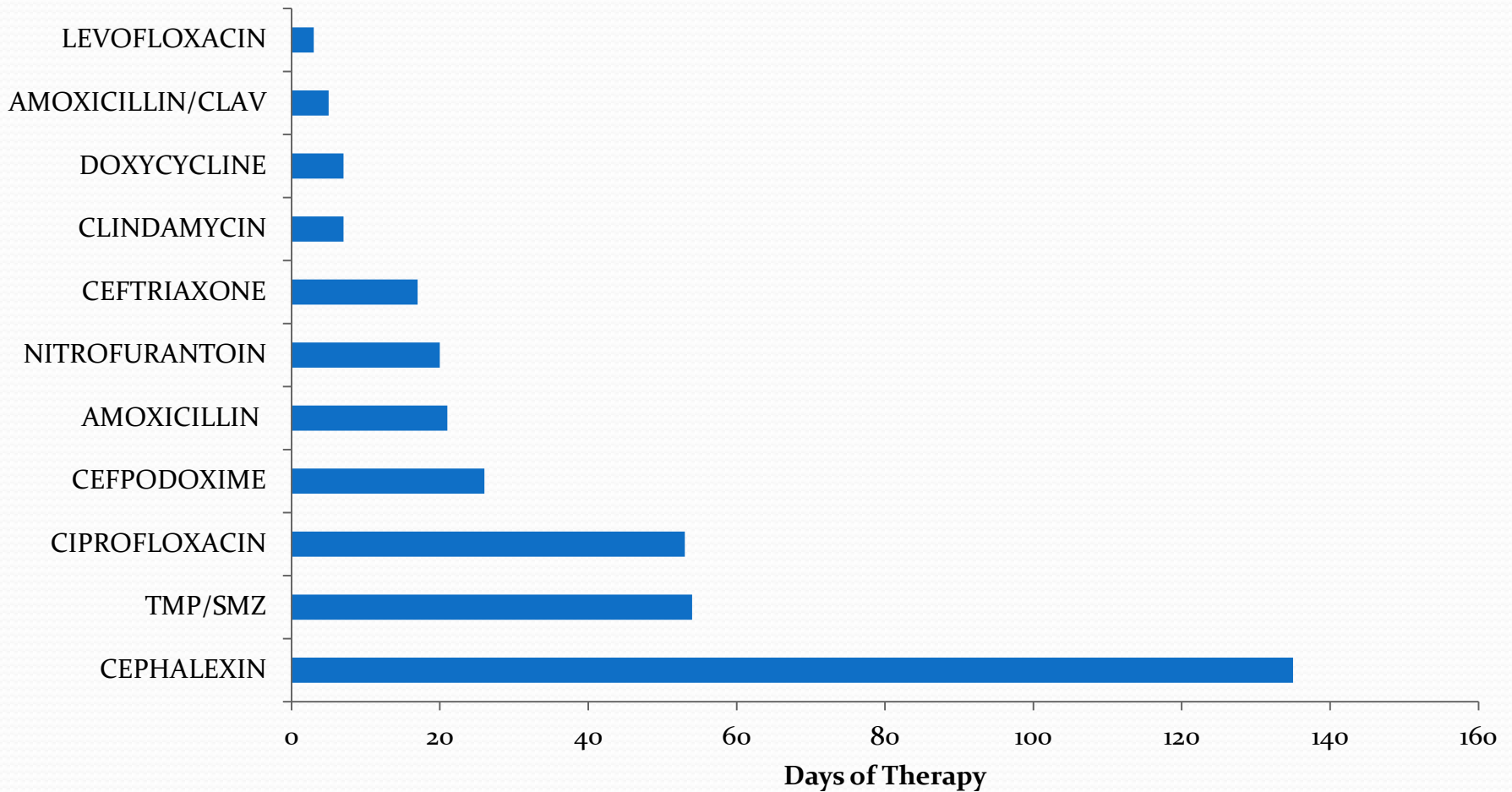
Example – Indication by Number of Residents

Nursing Home 1, Q3



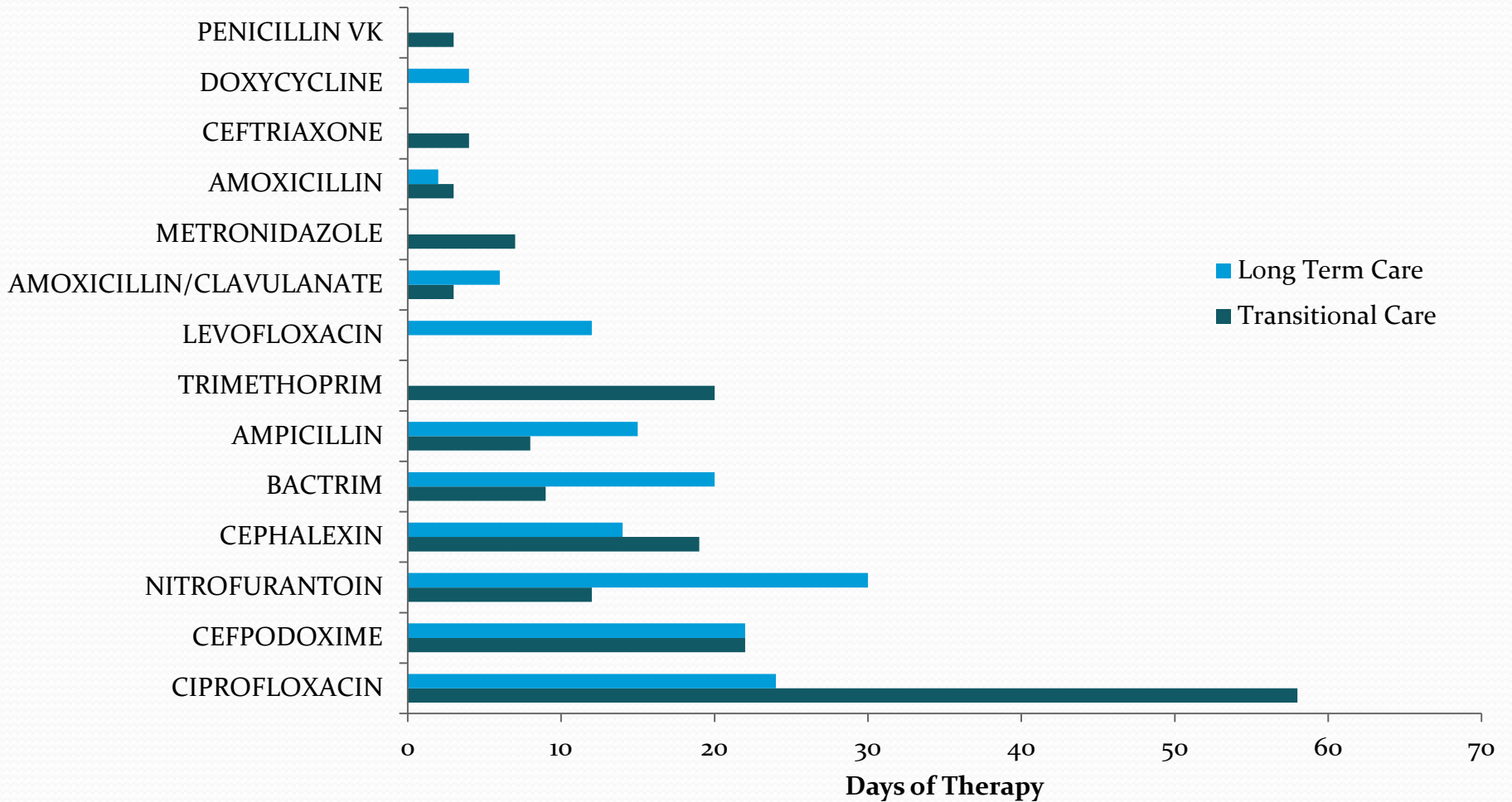
Example – Antibiotics Used for UTI Treatment

Nursing Home 1, Q3



Antibiotics Used for UTI Treatment may Vary by Home and Unit Type

Nursing Home 3, Q3



But this is not easy....

401 CEFPODOXIME 100 MG TABLET	PTAID/PROCA				4/6/2016	4/6/2016	1
401 CIPROFLOXACIN 250 MG TABLET	PYXIS/BOX				5/16/2016	5/16/2016	2
401 CIPROFLOXACIN 500 MG TABLET		TAKE ONE TABLET BY MOUTH	TWICE DAILY FOR 7 DAYS	FOR UTI	5/10/2016	5/10/2016	14
401 FLUCONAZOLE 100 MG TABLET		TAKE 1 TABLET BY MOUTH	EVERY 48 HOURS X 2 DOSES	(VULVOVAGINAL CANDIDIASIS)	5/20/2016	5/20/2016	2
401 METRONidazole 500 MG TABLET		TAKE ONE TABLET BY MOUTH	TWICE DAILY FOR 7 DAYS	FOR UTI	5/10/2016	5/10/2016	14
401 NITROFURANTOIN MCR 50 MG CAP		TAKE 1 CAPSULE BY MOUTH	ONCE DAILY. UTI PROPHY		4/12/2016	4/12/2016	14
401 NITROFURANTOIN MCR 50 MG CAP		TAKE 1 CAPSULE BY MOUTH	ONCE DAILY. UTI PROPHY		4/12/2016	4/25/2016	14
401 NITROFURANTOIN MCR 50 MG CAP		TAKE 1 CAPSULE BY MOUTH	ONCE DAILY. UTI PROPHY		4/12/2016	5/7/2016	14
401 NITROFURANTOIN MCR 50 MG CAP		TAKE 1 CAPSULE BY MOUTH	ONCE DAILY. UTI PROPHY		4/12/2016	6/6/2016	14
401 NITROFURANTOIN MCR 50 MG CAP		TAKE 1 CAPSULE BY MOUTH	ONCE DAILY. UTI PROPHY		4/12/2016	6/22/2016	14
401 SULFAMETHOXAZOLE/TMP DS TAB		TAKE 1 TABLET BY MOUTH	TWICE DAILY TIMES TEN	DAYS FOR UTI	4/5/2016	4/5/2016	20
522 CEFPODOXIME 200 MG TABLET		TAKE 1 TABLET BY MOUTH	TWICE DAILY X 7 DAYS FOR	PNEUMONIA	6/13/2016	6/13/2016	14
522 METRONidazole 500 MG TABLET		TAKE 1 TABLET BY MOUTH	EVERY 8 HOURS X 7 DAYS	PNEUMONIA	6/13/2016	6/13/2016	21
657 DOXYCYCLINE 100mg TABLET		TAKE 1 TABLET BY MOUTH	TWICE DAILY X 7 DAYS FOR	BRONCHITIS *SEP ADMIN	5/3/2016	5/3/2016	14
916 CEFPODOXIME 200 MG TABLET		TAKE 1 TABLET BY MOUTH	NOW THEN 1 TABLET THREE	TIMES A WEEK (M-W-F) AT	6/2/2016	6/2/2016	4
916 DOXYCYCLINE 100mg TABLET		TAKE 1 TABLET BY MOUTH	TWICE DAILY X 7 DAYS.	*BRONCHITIS*	6/2/2016	6/2/2016	14
916 SULFAMETHOXAZOLE/TMP DS TAB		TAKE ONE TABLET BY MOUTH	ONCE DAILY AT BEDTIME X 7	DAYS } UTI	4/23/2016	4/23/2016	7
916 SULFAMETHOXAZOLE/TMP DS TAB		TAKE 1 TABLET BY MOUTH	ONCE DAILY AT BEDTIME FOR	6 DAYS }	4/25/2016	4/25/2016	6
916 VANCOMYCIN 125 MG CAPSULE		TAKE 1 CAPSULE BY MOUTH	FOUR TIMES DAILY X 7 DAYS	C DIFF	4/23/2016	4/23/2016	28
916 VANCOMYCIN 125 MG CAPSULE		GIVE 1 CAPSULE BY MOUTH 4	TIMES DAILY FOR SIX DAYS		4/25/2016	4/25/2016	24
916 CEFEPIM 250 MG 5 ML ORAL SOL		GIVE 100ML (500MG) VIA PEG	THRE THREE TIMES A DAY X	14 DAYS. BRCESS	4/25/2016	4/25/2016	501

- May have to enter data manually into Excel
- Usually requires significant cleaning of the data in order to summarize with a pivot table
 - Standardize drug name
 - Assign drug type (antibiotic, antiviral)
 - Standardize indication
 - Calculate DOT if not provided

And it has limitations

- Dispensing data may not accurately reflect what residents actually receive
- Time consuming and labor intensive; may not be possible with hospital support
- Cannot differentiate between hospital and nursing home initiated antimicrobials
- DOT skewed by long antibiotic courses and long term prophylaxis

So start smaller instead

Starting Small

- **Do you know what infection is the most common reason for antibiotic use?**
 - Could determine this from antibiotic data or from infection logs
 - UTI is usually a common infection where antibiotic treatment is usually unnecessary

Starting Small Example: Infection Preventionist + Consultant Pharmacist

- Targeted one unit and perform an antibiotic review of residents treated for UTI
- IP collects initial data; consultant pharmacist adds treatment data and assesses what percentage of the treated residents fit the updated McGeer surveillance criteria
 - Looks at documentation of urinary symptoms
 - Looks at the culture and if there is bug-drug mismatch

Example

- Red fields filled out by IP; blue fields by consultant pharmacist

Residents without a catheter

Date	Patient Name	Medication	DOT	Indication	Positive UA (Y/N)	Culture Sensitive	Dysuria (Y/N)	Fever (Y/N)	Other Symptoms (Urinary urgency, frequency, pain, hematuria, incontinence)	Allergies	Appropriate abx?	Appropriate DOT?	Appropriate Dose?

Residents with catheter

Date	Patient Name	Medication	DOT	Indication	Positive UA (Y/N)	Culture Sensitive	Symptoms (Fever, rigors, delirium, flank pain, hematuria, pelvic discomfort, lethargy, CVA tenderness)	Allergies	Appropriate abx?	Appropriate DOT?	Appropriate Dose

Examples

Line list of Urines Obtained

Month/Year 12/2016

Name	Room	Date/Symptoms	U/A results	Culture results	Met Criteria	Treated
	134	12/14 Cough, Falls (afebrile)	(+)	12/14 >10 ⁵ E. coli	No	12/14 Azithromycin for Bronchitis
	116	12/20 worsening CKD (afebrile)	(+)	12/22 >10 ⁵ Mixed Colonies	No	None
	206	12/7 D's mental Status weakness, low grade T. (100.2)	(+)	12/12 >10 ⁵ E. coli	No	12/13 Cipro x 7 days
	218	12/13 Emesis, ↓ B/P, ↑ WBC urinary retention (afebrile)	(+)	12/13 >10 ⁵ E. coli	No	12/15 Cipro x 3 days
	236	12/23 ↑ WBC = "Hx of UTI's" (afebrile)	(+)	12/23 >10 ⁵ E. coli	No	12/27 Ampicillin x 2 days
	211	12/7 fall, ↑ confusion (afebrile)	(-)	12/8 No Growth	No	None
	336	12/7 foul odor, ↑ incontinence (afebrile)	(-)	12/7 >10 ⁵ E. coli	No	12/9 Keftex x 5 days
	326	12/8 Fall = 4. ⊕ sided pain (afebrile)	(-)	12/18 None done	No	None
	429	12/23 ↑ T, Lethargy, physical decline	(+)	12/23 >10 ⁵ Proteus mirabilis	No	12/27 Cipro x 3 days
	415	12/19 rigors, wheezing, crackles	(+)	12/20 51-100,000	No	12/20 Cipro x 3 days

Another “small” step

- **Do you know if you all your antibiotic orders have an indication?**
- Develop a system to ensure that all orders include:
 - Indication
 - Duration
- Although this intervention seems simple, it will likely require a coordinated effort between pharmacy, nursing and the providers
 - This is why it's important to form a team first!

Tools for Starting Small

Obtaining Facility-Wide Antibiotic Data

- **Medication Administration data**

- If available electronically, can ask IT to pull on a daily or weekly basis

- **Manual collection**

- Point prevalence
- Antibiotic start



Start on 1 unit and involve nursing and Infection Prevention

Antibiotic and Infection Tracking Sheet

- Excel tool with graphs built in so not as labor intensive
- Allows for monitoring of DOT and antibiotic starts over time
- Data can be obtained from morning report, infection log, chart review, MDS
- Expands on antibiotic data to also track culture results, symptoms, etc. to help measure appropriateness of antibiotics
- Using on even one unit will allow you to better understand the infection and antibiotic patterns in your home
- Tool available at: www.rochesterpatientsafety.com

Starting small – data feedback example

- Data should be monitored over time to measure trends
- Example of summary data for feedback and reporting
- Can be presented at quality and infection prevention meetings

	Number of urine cultures per month	Number of antibiotic starts for UTI	Patient days	Rate of urine cultures Per 1000 residents days	Rate of antibiotic starts Per 1000 residents days	C. Difficile rate per 1000 resident days
June	44	12	10133	4.3	1.2	2
July	37	10	10222	3.6	1.0	1
August	24	5	10450	2.3	0.5	1
September	27	7	11001	2.4	0.6	0

Tips for Success

- It's not one size fits all
- Build processes into your daily routine so can be continued despite turnover and competing priorities
- Present results to medical director and at quality meetings to gain buy-in
- Initial data collection will determine interventions; can be pared down over time to be less labor intensive
- Hospital expertise can help initiate program, provide treatment guidelines and provide education on how to monitor data over time