



Texas Children's Hospital: Pediatric Collaboration to Develop an Antimicrobial Stewardship Program



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Antimicrobial Stewardship Program

Texas Children's Hospital

Department of Pharmacy

DISCLOSURES

- Grant support from Pfizer for the Sharing Antimicrobial Reports for Pediatric Stewardship (SHARPS) collaborative
- Jason Newland, MD gave permission to utilize selected SHARPS slides

Background

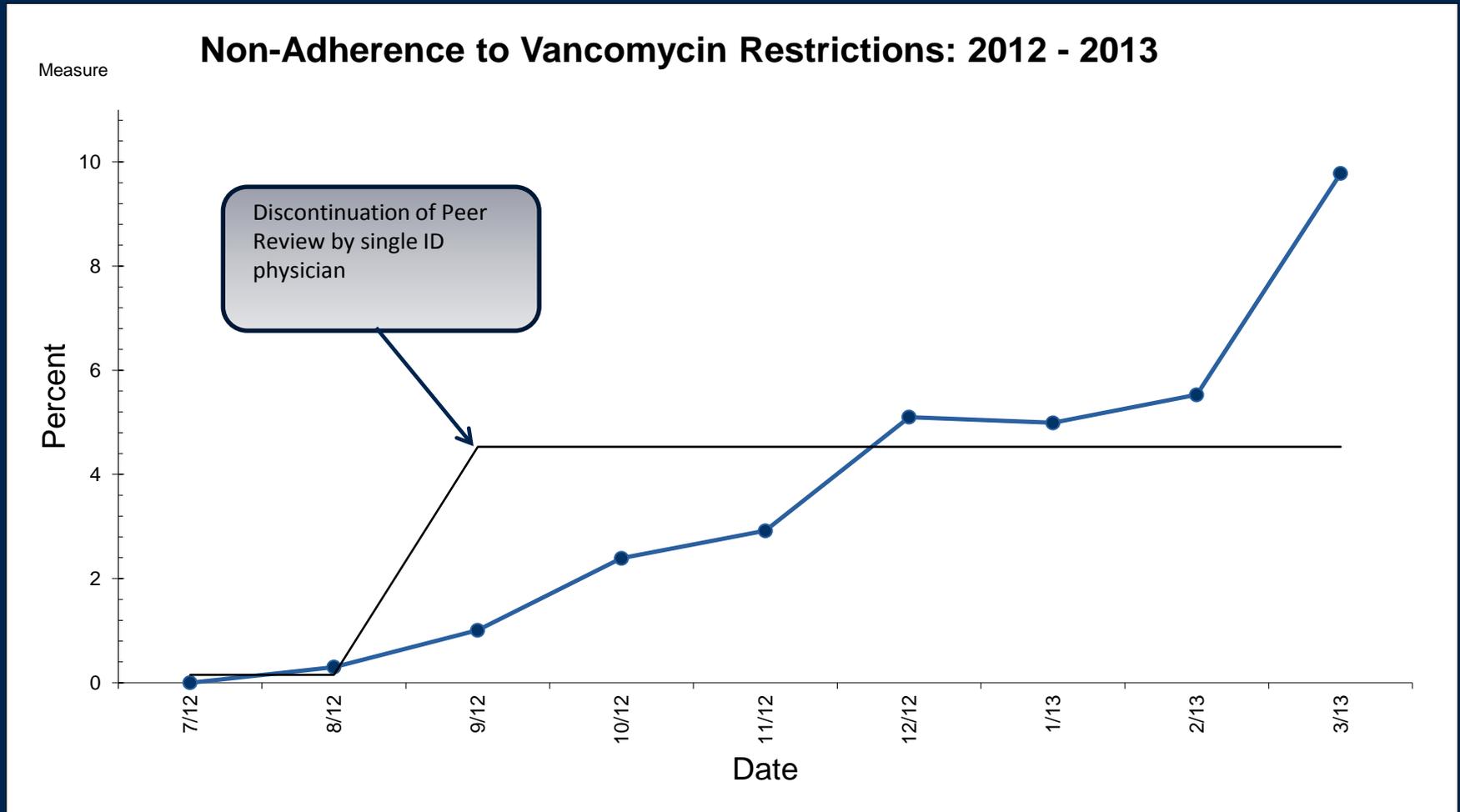
- 33-60% of hospitalized children receive at least one antibiotic during their stay^{1,2}
- Approximately 50% of antibiotic use is inappropriate
- Among 39 free-standing children's hospitals, 16 had a formal Antimicrobial Stewardship Program (ASP)³
- The most effective methods for stewardship are unknown

1. Gerber J et al., Pediatrics 2010 126:1067
2. Pakyz AL et al. ICHE 2009 30:600-03
3. Newland et al. ICHE 2014 35:265-71

Historic ASP Elements Utilized at TCH

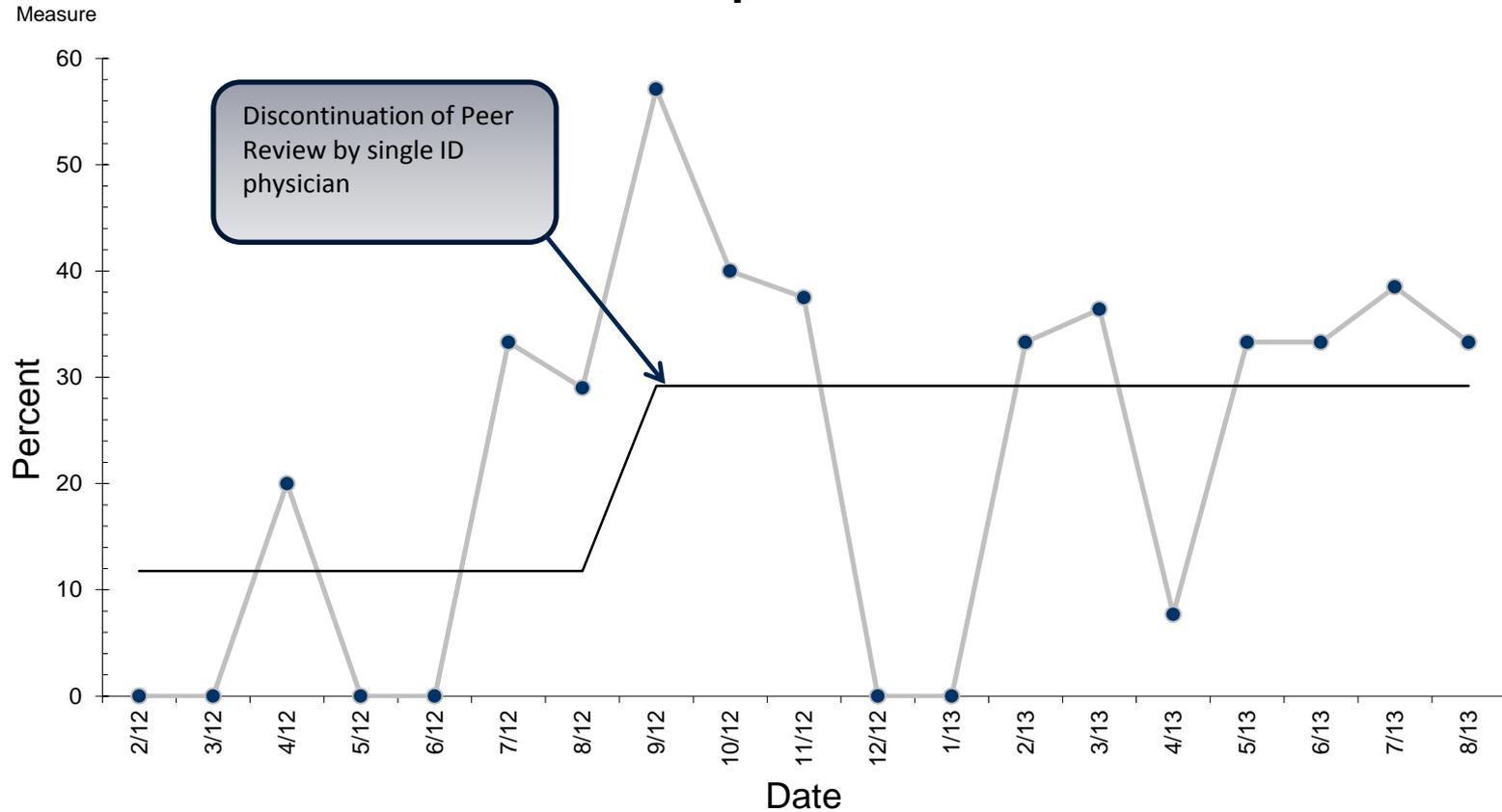
- Formulary restrictions existed:
 - Allowing order by physician specialty:
 - Voriconazole (Heme/Onc, BMT, Lung txplant, ID)
 - Caspofungin (BMT, ID)
 - Meropenem (Pulmonary, ID) *[formally peer-reviewed by single ID physician]*
 - By drug:
 - Vancomycin (3-day stop order): Pharmacist reviews at 72-hours, extends therapy if criteria met. *[Formally peer-reviewed by single ID physician]*

Vancomycin Usage Changes

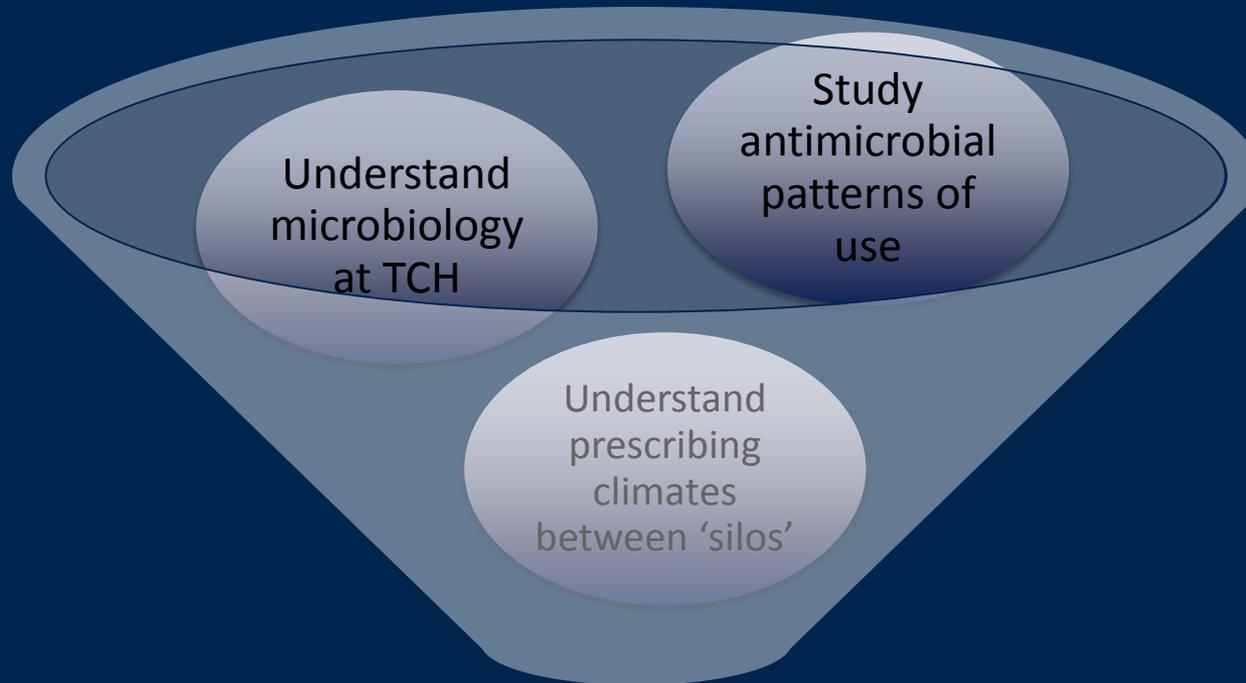


Meropenem Usage Changes

Non-Adherence to Meropenem Restrictions: 2012 - 2013



Multidisciplinary ASP Implementation



Who, What, When, Where, Why
of Antimicrobial Usage at TCH

Multidisciplinary Team Formed – November 2013

TCH Barriers

- Limited real-time data
- Lack of electronic notification of culture positivity to care team providers
- Lack of alert to care team providers of updated culture information
- Inability to rapidly review existing culture data
- Frequent changes in care team providers

Initial SHARPS Hospitals 09/13



All hospitals provide data to PHIS

Objective

- Establish an antimicrobial stewardship quality improvement collaborative that would:
 - Provide antimicrobial use reports to guide ASP interventions
 - Allow for benchmarking among institutions
 - Share successful interventions
 - All teach, All learn philosophy

Methods

- Pediatric Health Information Systems Database
- Free standing children's hospitals
- Provides billing and administrative data on discharged patients
- Data pulls occur quarterly
- Data quality checks performed

Methods

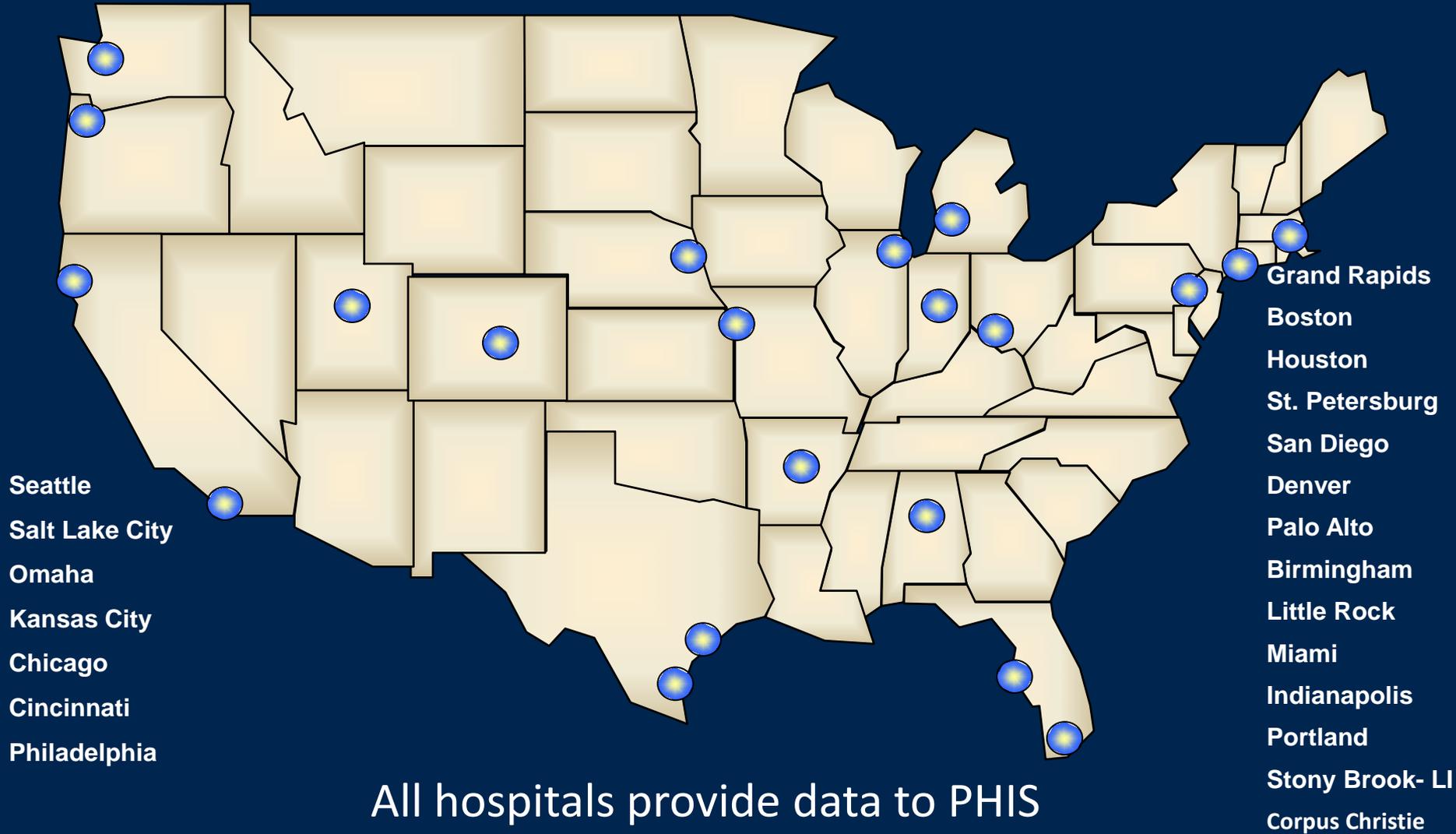
- Standard and customized benchmarking reports were provided. Examples include:
 - Overall antibiotic days of therapy (DOT)
 - Ampicillin use for pneumonia
 - Anti-pseudomonal antibiotic use for appendicitis
 - Overall carbapenem DOT and in BMT unit
 - % oral DOT for highly bioavailable drugs
- Monthly webinars to discuss progress and barriers with interventions

Actions by initial hospital cohort

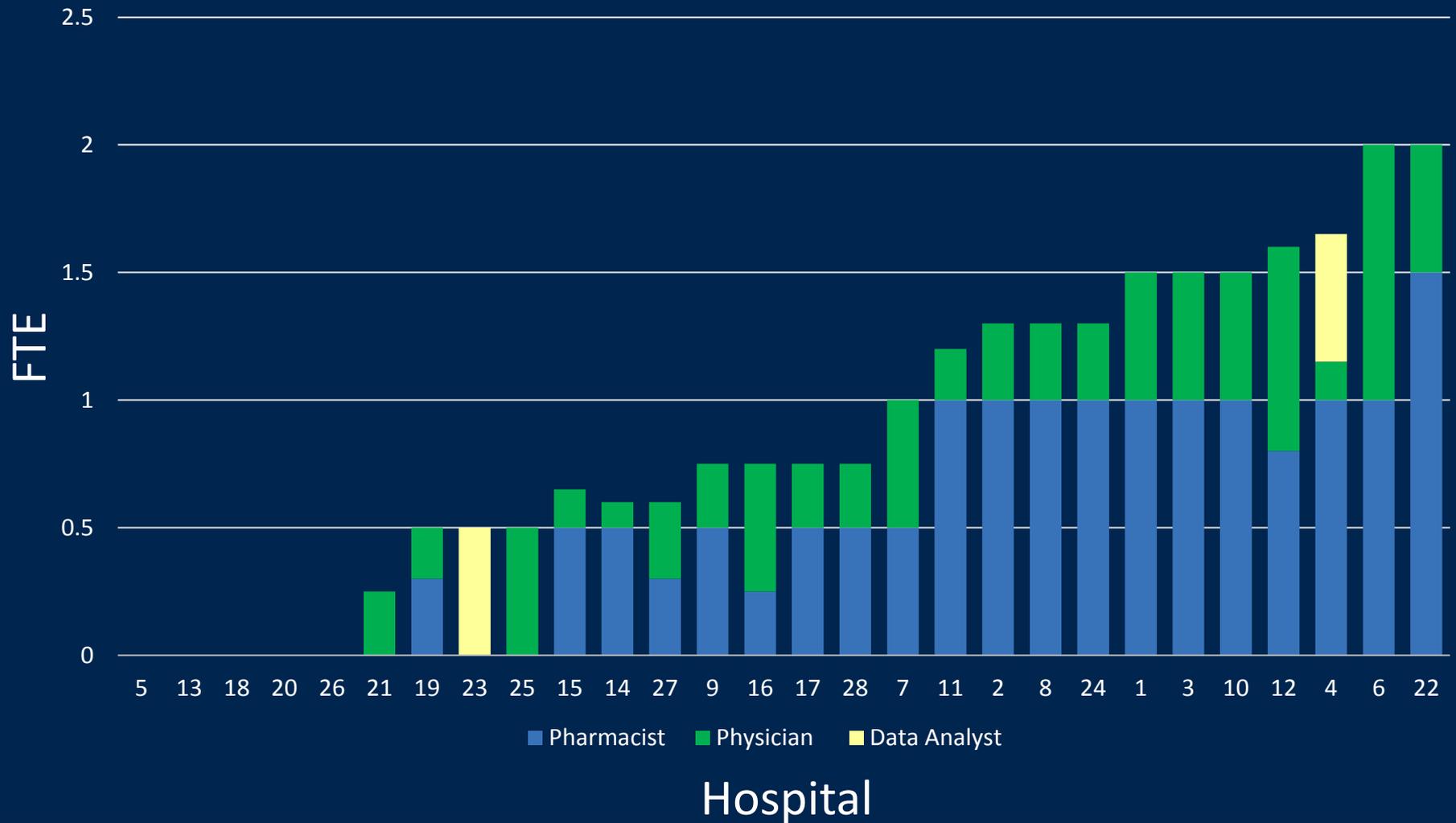
Interventions implemented by hospitals:

- Implementation of various forms of rapid diagnostic tests (RDT).
- CAP pathways developed with order sets
- Clinical pathway/guideline for empiric abx use in BMT steering away from carbapenems
- Heme/onc de-escalation process when carbapenems are used
- IV to PO conversion protocol

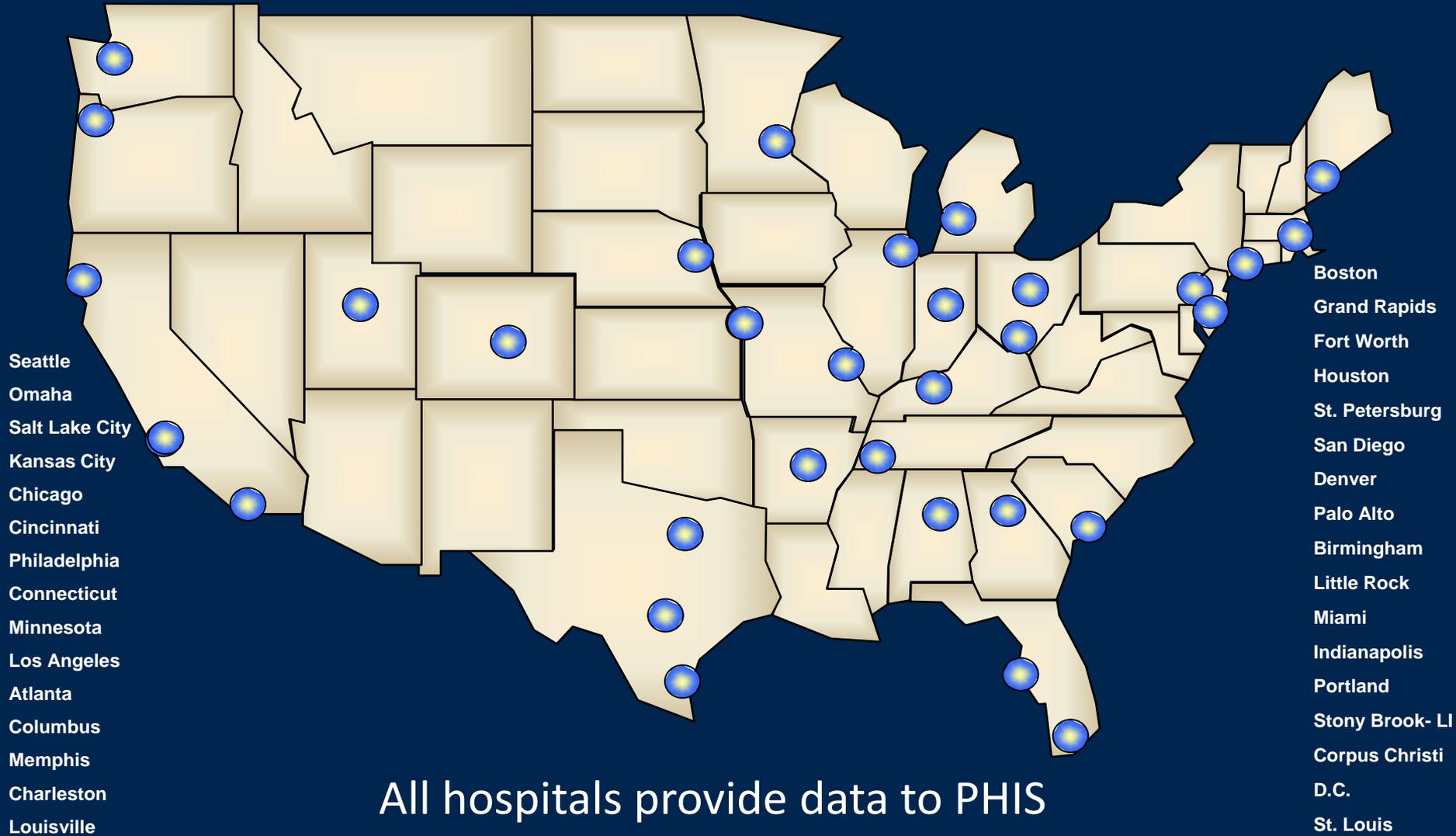
SHARPS member additions: 06/14



Results: FTEs per hospital

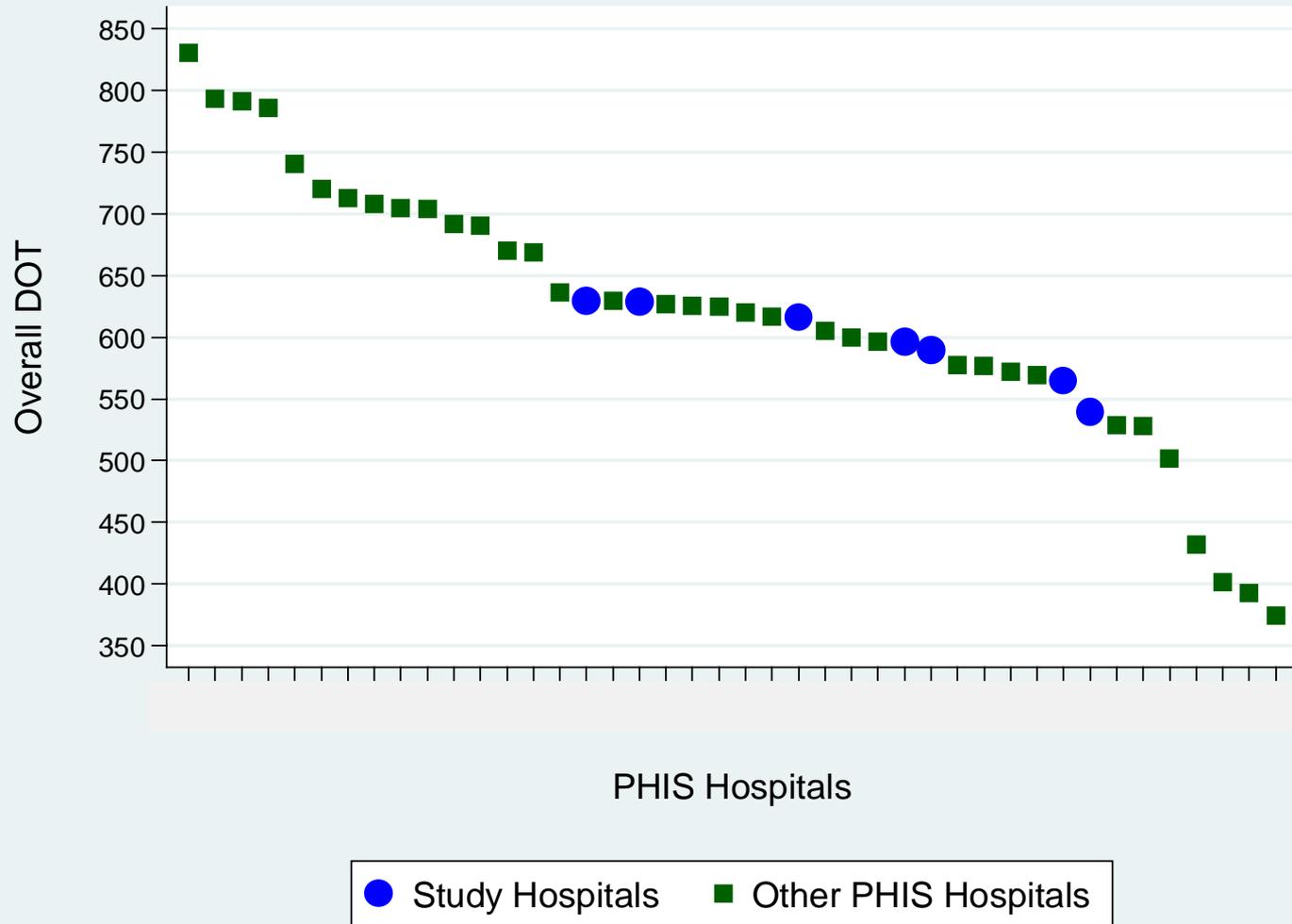


SHARPS Hospitals as of 02/15

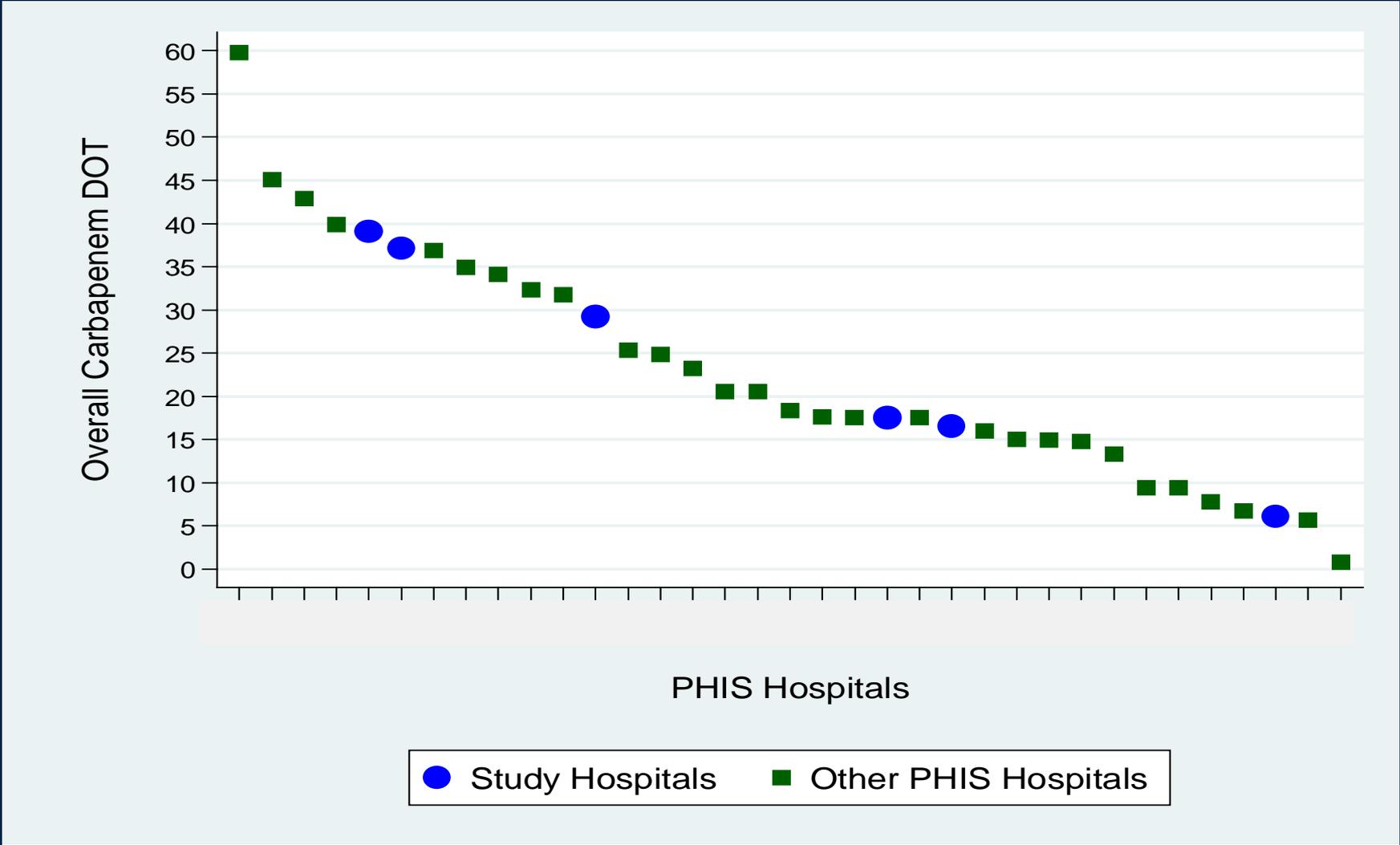


All hospitals provide data to PHIS

Overall DOT



Carbapenem Use

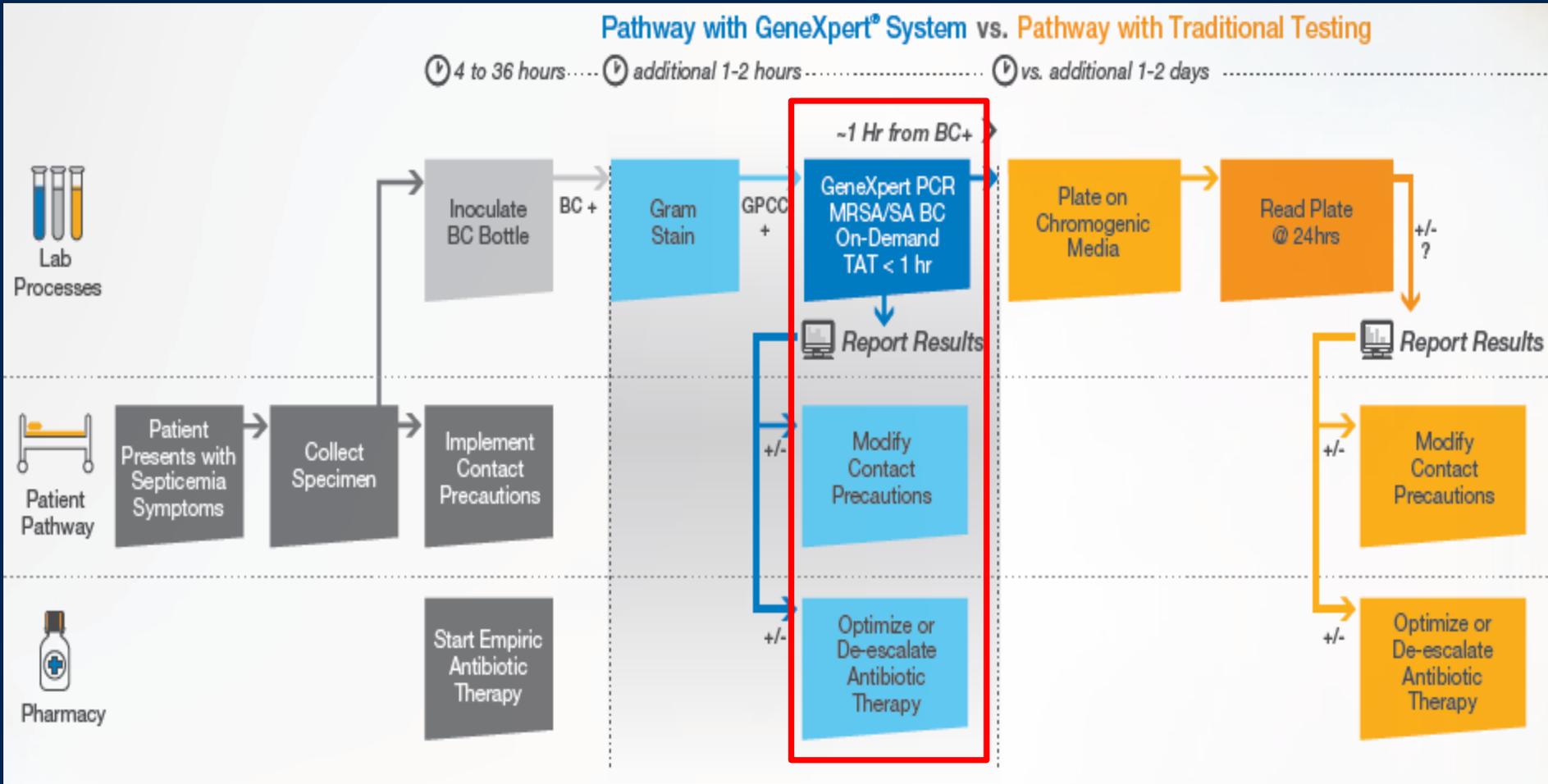


SHARPS Conclusions

- Benchmarking data reports aid ASPs in determining areas to target
- Collaborative approach provides expertise and experience for others to learn best practices
- Collaborative approach allows best practices to be implemented that will work for each unique hospital

Rapid Diagnostic Test: GeneXpert

Our 'Quick Win'



ASP Intervention: GeneXpert Result Notification

Pre-intervention (March to June 2014) n=221	Post-intervention (July to October 2014) n=236
Gram-stain: GPCs in clusters (n=173) n (%) <ul style="list-style-type: none"> • MRSA 11 (6.4) • MSSA 20 (11.6) • CoNS 142 (82) 	Gram-stain: GPCs in clusters (n=183) n (%) <ul style="list-style-type: none"> • MRSA 10 (5.5) • MSSA 24 (13.1) • CoNS 149 (81.4)
Time to traditional identification: 1836 ± 768 min	Time to molecular identification: 180 ± 250
	ASP notification (n=102)
MSSA: Time to de-escalate from Vanc 2632 ± 1236 min	MSSA: Time to de-escalate from Vanc 115 ± 121 min
CoNS [excluded: pts with CL, NICU, immunocompromised] (n=58) 704 ± 581 min	CoNS [excluded: pts with CL, NICU, immunocompromised] (n=68) 241 ± 305 min

GPC= Gram-positive cocci, MRSA=methicillin-resistant *Staph aureus*, MSSA=methicillin-sensitive *Staph aureus*, CoNS=coagulase-negative *Staphylococcus*, CL=central line

TCH Executives Recognize Opportunity

- Building needs/requests approved for further investigation:
 - Integration of patient parameters within the EHR
 - EPIC 2014-Infection Control/ASP module
 - Additional analytics: real-time dashboards facilitating:
 - ASP activities
 - Provider notification when new data exists
 - Discrete microbiology data
 - Surveillance of antimicrobial usage and microbial resistance

Future TCH actions

- Continue to utilize PHIS data to monitor progress longitudinally
- Optimize integration of data elements within the EHR
- Effectively implement/utilize additional RDT
- Utilize the SHARPS collaborative to perform multi-centered studies for stewardship and ID practice

Questions

