

CSF Virology Testing

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#TheGSQIAWay #TeamGSQIA @gsqia



Introduction

- Local paediatric audit
- Aim
- Diagnosis current problem
 - Root cause analysis
- Understanding the system
 - process mapping, driver diagrams
- PDSA and measures
- Next steps



Paediatric audit 2019

- NICE (2019) Fever in under 5s: assessment and initial management (NICE Guideline 143).
- Management of infants up to and including 3 months of age with fever and presumed bacterial infection
- Audit was conducted between 1st Jan-30th Aug 2019, cohort of 50
- Up to and including 3 months of age
- Admitted for > 24hours to Children's In-patients (CIP)
- Coded for fever, sepsis and unwell



Paediatric audit 2019

Standard	Target	Achieved
1. Blood culture should be obtained for culture	100%	100%
2. Urine sample should be obtained for culture & microscopy	100%	94%
3. CSF sample should be obtained for culture and microscopy	100%	100%
4. All samples should be 24 hours in the lab at 36 hours into admission	100%	62%
5. Viral PCR result should be available at 48hours into admission	100%	12%
6. TAT from LP to Viral PCR results being available to Clinicians	4.01 days (4.2 days)	

Diagnosis	%
Infants who were unwell and/or fever (38 $^{\circ}$ C or higher) who did not have a bacterial or viral pathogen detected	46
Viral PCR positive for Enterovirus	32
Confirmed bacterial infection	16
Influenza A detected on NPA	6



The Aim

The Model for Improvement

AIM

What are we trying to accomplish?

MEASURES

How will we know that a change is an improvement?

CHANGES

What changes can we make that will result in improvement?



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SMART Aim:

To reduce viral PCR turnaround time from 4.2 days to 36 hours in 6 months

Outcome measures:

TAT of viral PCR samples

Process measures:

Number of CSF samples received from paediatrics for viral PCR

How many viral PCR results are available at 36 hours from the sample being taken

How many viral PCR samples were received in the laboratory within 12 hours of admission

Balancing measures:

Increase in costs through bring assay in-house—reagents, maintenance contracts, staff costs

Changes:

Establishing in-house testing during working hours Extending in-house testing to weekends Extending in-house testing to OOH

Root Cause Analysis



Patient Factors

- Children presenting with non-specific signs
- Prolonged and /or unnecessary antimicrobial treatments
- Possible adverse effects of treatment and line-associated issues

Task Factors

- -PCR at Reference laboratory preformed once daily at 11am.
- -Couriers provide collection twice a day Mon-Friday 12:30 and 16:30
- Many different members of staff handling samples

Communication Factors

- Microbiology not informed of samples arriving in laboratory
- -Sample need to be booked on to IPS twice to generate a referral test
- -Results transcribed from ICE on to IPS

Team and Social Factors

-Lack of continuity in staff handling samples and reporting results

> Delayed Turnaround times for Viral PCR results on Paediatric CSF samples

Education and training Factors

- Not all GRH staff trained in viral PCR
- -Lack of clinical confidence in current viral PCR testing
- -Lack of education in regards of urgency of viral PCR results samples are

Equipment and Resources Factors

- Current PCR offsite
- Analyser on-site awaiting syndromic panel release
- -ME panel needs validation/verificati
- Currently no NPEx link with Reference laboratory for viral PCR

Working Conditions

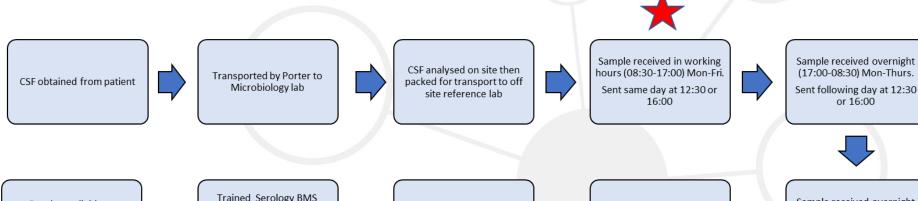
- -Neither GRH nor reference laboratory offer 24 hours viral PCR testing
- Lack of staff with ICE access to track down reference laboratory results
- No dedicated time or staff to look up outstanding results
- ICE checked Mon-Fri 8.30-17.00

Organisational and Strategic Factors

- -COVID pandemic
- -Manufacturer delaying kit release
- -Funding



Process Mapping



Results available to requesting Clinicians on local system. CMM alerted to positive results.



Trained Serology BMS access reference laboratory system and enter result on to local computer system (mon-Fri 08:30-17:00)



Sample processed (11:00 daily) and resulted on reference lab system



Taxi/ Courier transports to reference lab (approx. 1 hour)



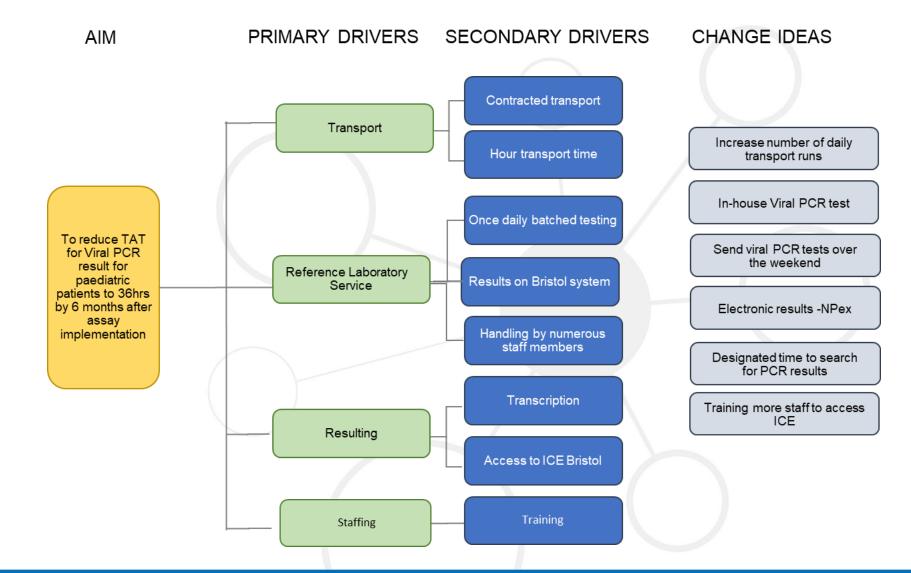
Sample received overnight Fri or at weekend.

Sample held till Mon (up to 3 days).

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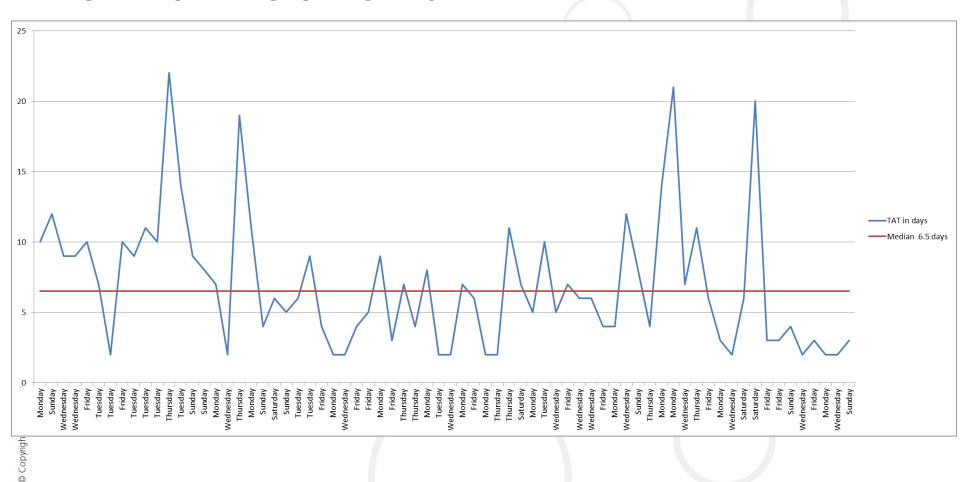
Driver Diagram







Is it a weekend?





Qiagen ME assay

- Analyser already sited
- Syndromic Testing
- 16 targets
- Automated sample preparation, amplification, detection and analysis in onestep
- Limited hands-on time ~ 2 minutes
- Run time of 80 minutes





PDSA and Measures

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So far.....



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REGISTER QI PROJECT WITH THE TRUST AND PATHOLOGY DEPARTMENT



VERIFICATION OF PANEL AND ANALYSER



TRAINING OF BMS AND AP



FINANCIAL PLAN TO ESTABLISH COSTINGS



INTRODUCE ASSAY TO ROUTINE WORKFLOW









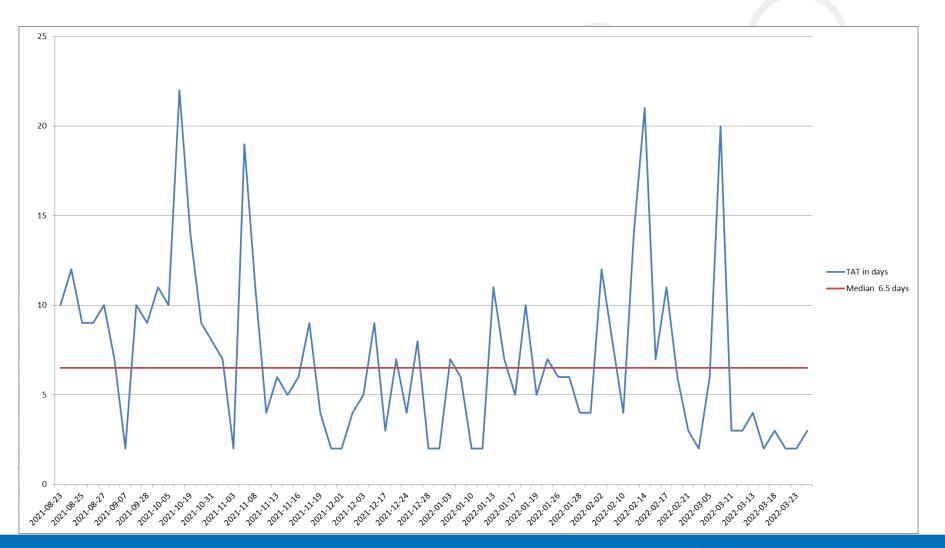


Measurements

- Do we still have a problem?
- Plot run charts of turn around times prior to implementation
- Plot run charts after initial introduction and for each adaptation/expansion



Current TAT



Next steps.....



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Thank you for listening

Any questions?