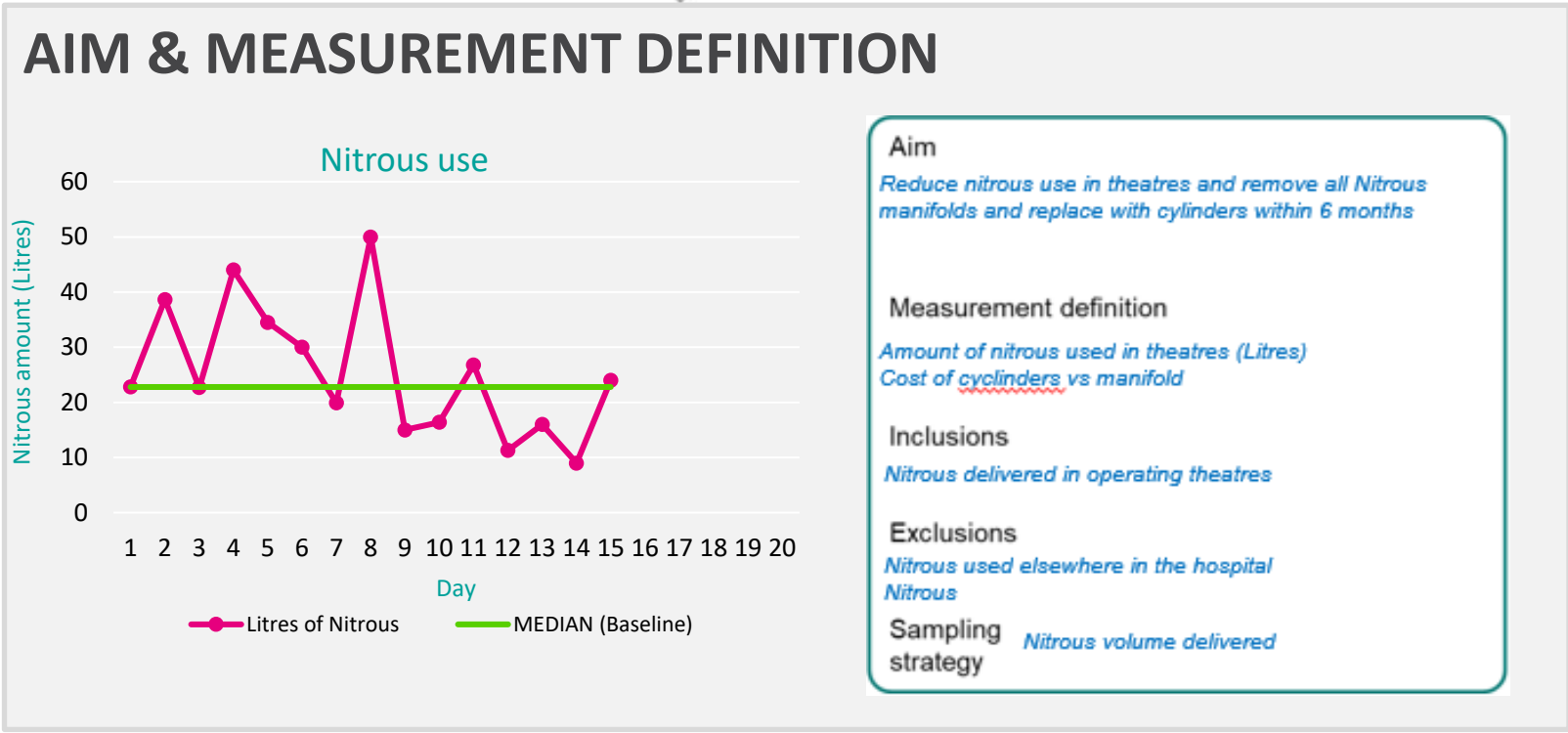
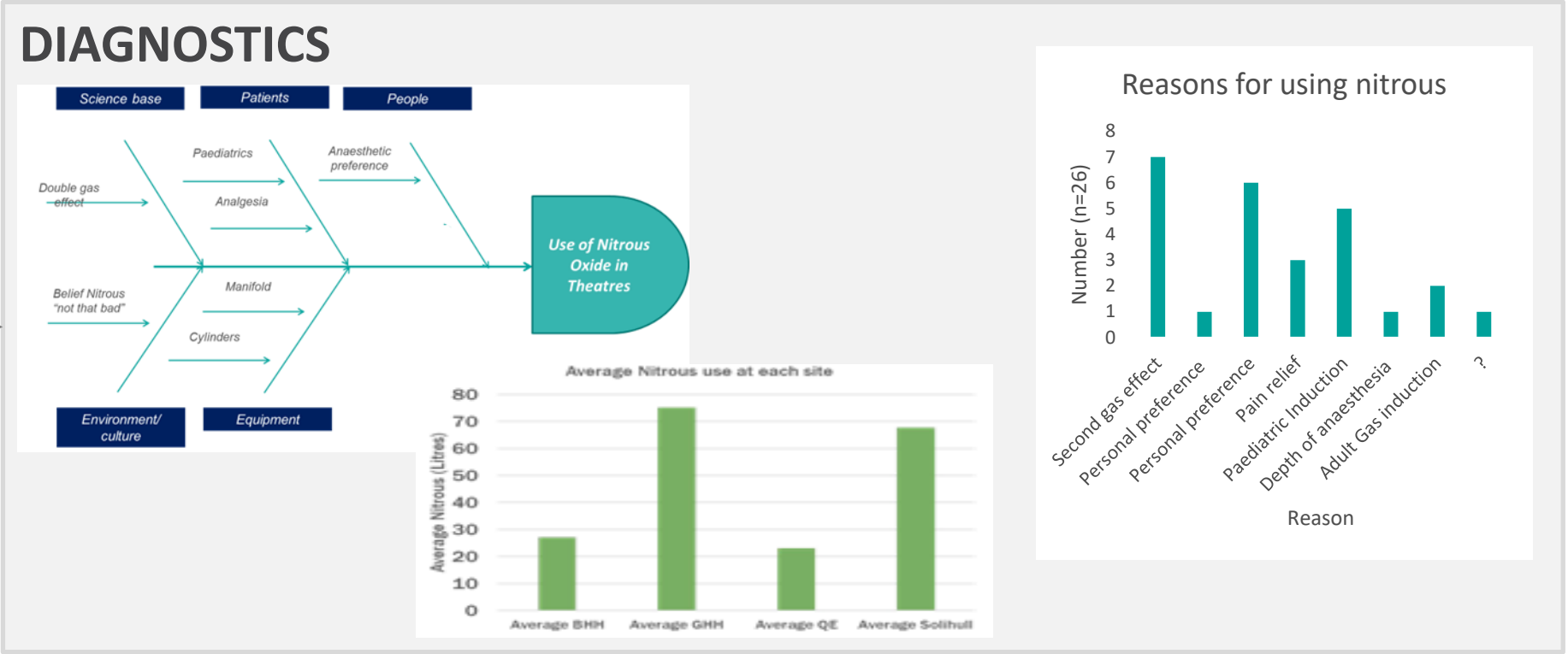


Use of Nitrous Oxide in Theatres – Can We Reduce Piped Supply?

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BACKGROUND

Nitrous oxide contributes around 80% of the total anaesthetic gas carbon footprint. Use of nitrous oxide in anaesthesia has been extensively debated on clinical grounds over the years; however, the environmental impact can no longer be ignored. Huge amounts are wasted due to leakage from piped supplies, and manifold cylinders reaching their expiry date. We wanted to determine how much nitrous oxide was being used across a large, multisite Trust in Birmingham (UHB), with a view to decommissioning piped supply



- CHANGE IDEAS**
- Work with medical gases team regarding removal of manifolds
 - Talk to medical gases team about costing
 - Reduce manifold size or decommissioning manifolds even if they can't be removed
 - Selecting cylinder sizes for theatres
 - Introduction of remifentanyl PCA in Maternity as an alternative to Entonox
 - Investigate use of mobile destruction units (MDU) which convert waste nitrous oxide to nitrogen and oxygen - however, this has cost implications

PDSA Test #	PLAN	Do	STUDY	ACT
1	Replace anaesthetic machines with those capable of holding cylinders	Cost machines compared to piped nitrous supply	Conversations with consultants and managers demonstrated that purchase of new anaesthetic machines would be too costly	Abandon attempts to replace anaesthetics machines
2a	Discuss converting to nitrous cylinders with consultant body	Discuss findings of audit at audit meeting	Invited comments from consultants revealed that although nitrous is used sparingly, its usefulness in practice outweighs removing it from the pipeline	Continue piped supply but continue education around nitrous as a greenhouse gas
2b	Continue education about nitrous as a greenhouse gas	Repeat audit and present findings to consultant body	Rolling audit of nitrous use – declining use can strengthen the economic argument for removing manifolds	Yearly re-audit of nitrous use in the department
3	Stop manifold supply	Cost machines compared to piped nitrous supply	On further investigation, the hospital has just commissioned building of a new theatre block, which includes the nitrous supply built in to the design	In combination with cost of replacing anaesthetic machines and costs already spent on the new building, stopping manifold supply for now has to be delayed

REFLECTIONS & LEARNING

- Despite the initial findings of the QI project, the barriers were too much for the project to continue at present
- Change can be difficult to achieve, despite obvious cost and environmental advantages
- Some of the barriers to these changes are institutional but some are the fixed beliefs of medical staff