

### Quality indicators - performance tools of blood transfusion service

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### Abstract

#### Introduction

The primary goal of transfusion medicine is to promote high standards of quality in all aspects of patient care and services. BTS can reach the highest levels of efficiency through implementation of quality management systems (QMS).<sup>1</sup> QMS includes the organizational structure, responsibilities, policies, processes, procedures, and resources established by the management to achieve and maintain quality.<sup>2</sup> Quality indicators are Quality Management System (QMS) tools which provide proof of the level of quality performances. utilize the information gained to seek improvements in the quality.<sup>3</sup>

Hence they monitor & evaluate the quality of transfusion process.

### Aims & objectives

To evaluate and analyse quality indicators as per performance tools of our Blood Transfusion Services.

### Materials & methods

- Study design: Retrospective study.
- Duration of study: 1 year (2022)
- Place of study: Department of IHBT, G.G Hospital Blood Center, Jamnagar, Gujarat.

The data was captured for 8 quality indicators defined by NABH, namely;

- TTI%
- Adverse transfusion reaction rate
- Wastage rate for each component
- TAT for blood issues
- Component QC failure
- Adverse donor reaction rate

- Donor deferral rate • % of components issued
- $TTI\% = \frac{\text{Combined TTI cases (HIV + HBV + HCV + Syphilis + MP)}}{\text{Total Number of Donors}} \times 100$

Total Number of Donors

- Adverse Transfusion Reaction Rate % =  $\frac{\text{No. of adverse transfusion reactions}}{\text{Total no. of blood and components issued}} \times 100$

Total no. of blood and components issued

- Wastage rate % =  $\frac{\text{No. of blood/ blood components discarded}}{\text{Total no of blood / blood components issued}} \times 100$

- Turnaround Time (TAT) of Blood Issues = Sum of the time taken\_

Total number of blood and blood components cross matched/reserved

- Component QC failures (for each component) =  $\frac{\text{No. of component QC failures}}{\text{Total no. of component tested}} \times 100$

Total no. of component tested

- Adverse Donor Reaction Rate % =  $\frac{\text{No. of donors experiencing adverse reaction}}{\text{Total no. of donors}} \times 100$

Total no. of donors

- Donor Deferral Rate % =  $\frac{\text{No. of donor deferrals}}{\text{Total no. of donation + total no. of deferrals}} \times 100$

- % of components =  $\frac{\text{Total component issues}}{\text{Total whole blood + component issues}} \times 100$

Total whole blood + component issues

Outcomes of the data were analysed and charted.

### Result

A total of 23007 blood bags were collected of which 22145 units were separated into components and rest were either kept as whole blood or were discarded.

QI's	2022
TTI%	0.59%
ATRR%	0.019
WASTAGE RATE%	1.74

WB	0.43
PCV	9.30
PLATELET	2.12
FFP	
TAT	2.10 HRS
ROUTINE	26.99 MINUTES
EMERGENCY	
QC FAILURE RATE%	0
ADRR%	0.61
DDR%	3.19%
% COMPONENTS ISSUE	97.05%

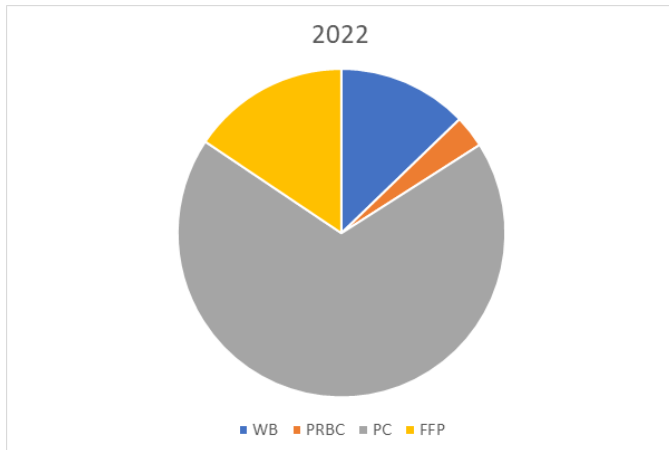
### Discussion

Quality Indicator Data is acted upon by<sup>4</sup>

- Continuous measurement
- Identifying problems
- Root cause analysis
- Implementing corrective action
- Developing a quality improvement strategy (Preventive action)
- Reporting
- Seeking opportunities for improvement.
- Overall TTI % was 0.59%.
- HBsAg was most seroprevalent.
- Similar findings in Fernandes et al. (2010)<sup>5</sup> - 0.6% and Zulfikar et al. (2102)<sup>6</sup> - 0.82%.
- Proper donor screening -reliable screening tests - counselling of positive donors.<sup>7</sup>
- Overall ATRR % was 0.0159%, similar to Bhatta charya et al (2011)<sup>8</sup> -0.18% and Chakravarty-Vartak et al (2016)<sup>9</sup> - 0.16%
- Majority caused by allergic reactions and FNHTR's (90%).
- Use of newer technologies like leukoreduction, reporting of all adverse events & continuous education

to medical and paramedical staff will help in reducing the ATR's<sup>10</sup>. Overall wastage rate of WB-1.74% PRBC -0.43% Platelet -9.30% FFP -2.12%. Similar studies- Suresh et al (2015)<sup>11</sup> & Kaur et al (2016)<sup>12</sup>. Most common discarded units were platelets due to date expiry. Judicious use of blood can minimize the number of discarded bloods to a reasonable rate.

Graph 1:



Overall, TAT for routine issues was 2.10 hours similar to study Gupta et al<sup>13</sup> (2015) -2.55 hours Overall TAT for emergency issues was 26.99 min similar to Ramana et al<sup>14</sup> (2015)- 30.3 min. Training of the technical staff to act momentarily for blood requests.

Overall QC failure rate = 0

1% of component is tested for Quality Control out of which 75% should match the acceptable ranges.<sup>15</sup>

Overall ADRR% was 0.61%

- Similar studies- Abhishekh et al<sup>16</sup>(2013)- 2.03% and Kumar et al<sup>17</sup> (2014)- 0.93%

Majority were vasovagal in nature.

- Pre-donation counselling, post donation counselling and care required to minimize risk of adverse events.<sup>18</sup>

DDR% was 3.19%

- Similar studies-John et al<sup>19</sup>(2015)- 5.12%, Rehman et al<sup>20</sup> (2012)-12.4%, Agnihotri et al<sup>21</sup>(2010)-11.6%

Variability can be due to demographics of study population. Most common cause low Hb followed by medication history. Modification of donor recruitment strategies, -Rationalization of deferral criteria and -counselling of deferred donors.<sup>20</sup> Overall Percent component issue was 97.05%. More in 2015 (98.99%) than 2014 (97.86%). We are not into 100% components as during big camps all collected blood is not separated into components.

### Conclusion

Blood and blood components play an essential role in patients' management<sup>22</sup> Blood components are frequently ordered and utilized without proper analysis of the real needs, thus wasting a very important resource. A well-structured BTS contribute towards better healthcare<sup>22</sup> - QIs are important QMS tool for accomplishment of the quality goals.<sup>23</sup> Quality improvement by QI's- enable an organization to attain higher levels of performance by creating new or better standards or removing deficiencies in products, processes or services.<sup>2</sup> Stakeholders need to ensure that the QI's are instituted in the right way for improving the quality of BTS in the organization.<sup>24</sup> Thus, this study provide a basis for the implementation of corrective measures and continuous quality improvement by means of QI's.

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