CONTRIBUTION OF EQA TO IMPROVE PREANALYTICAL PRACTICES BY SYSTEMATIC VERIFICATION OF LABORATORY SERVICES

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Introduction and Aim

International literature describes the preanalytical phase as the most susceptible to errors due to the numerous non-automated activities it involves. Most EQA organizers offer preanalytical schemes to participants. There are basically three types of surveys: procedures registration, samples circulation and errors registration. The Portuguese EQA Programme (PNAEQ) provides these type of schemes for 13 years, using as a guide the ISO 15189:2012. In order to improve the evaluation of the preanalytical phase, PNAEQ recently launched two other preanalytical EQA schemes, mystery client and presential audits in 2015 and 2016, respectively.

The aim of the **mystery client survey** is to verify whether the information provided to the patient is constant regardless the day and time or if it is dependent on the collaborator.

The aim of the **presential audit survey** is to give the participants a tool to verify if the procedures performed daily are in accordance with laboratorial good practices recommendations

Mystery Client

Methodology

Mystery client was firstly performed in 2015. PNAEQ prepares an "interview" guide with questions simulating a patient and makes two anonymous phone calls in different date/time to each laboratory. Figure 1 presents the example performed in 2018 (the 2019 round will be performed in the 4th quarter). The questions are regularly modified so that the participants cannot identify PNAEQ as the client. It is also requested the name of the collaborator replying the phone in order to ascertain whether the two telephone calls are answered by the same operator. Participants who do not answer after three attempts are excluded of the round. Results are presented as a comparison of the answers obtained in the two calls for the validated participants.

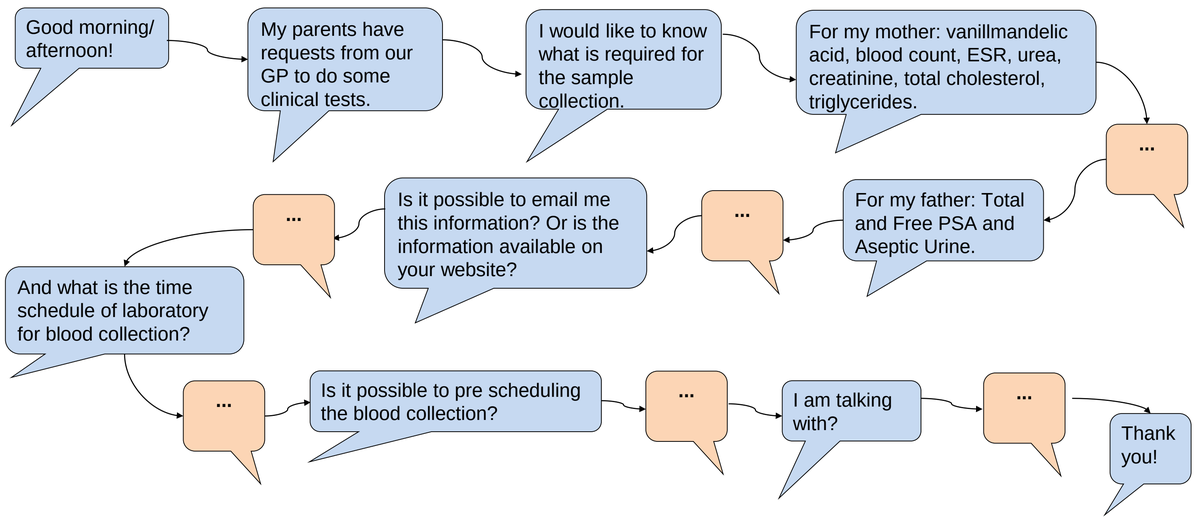
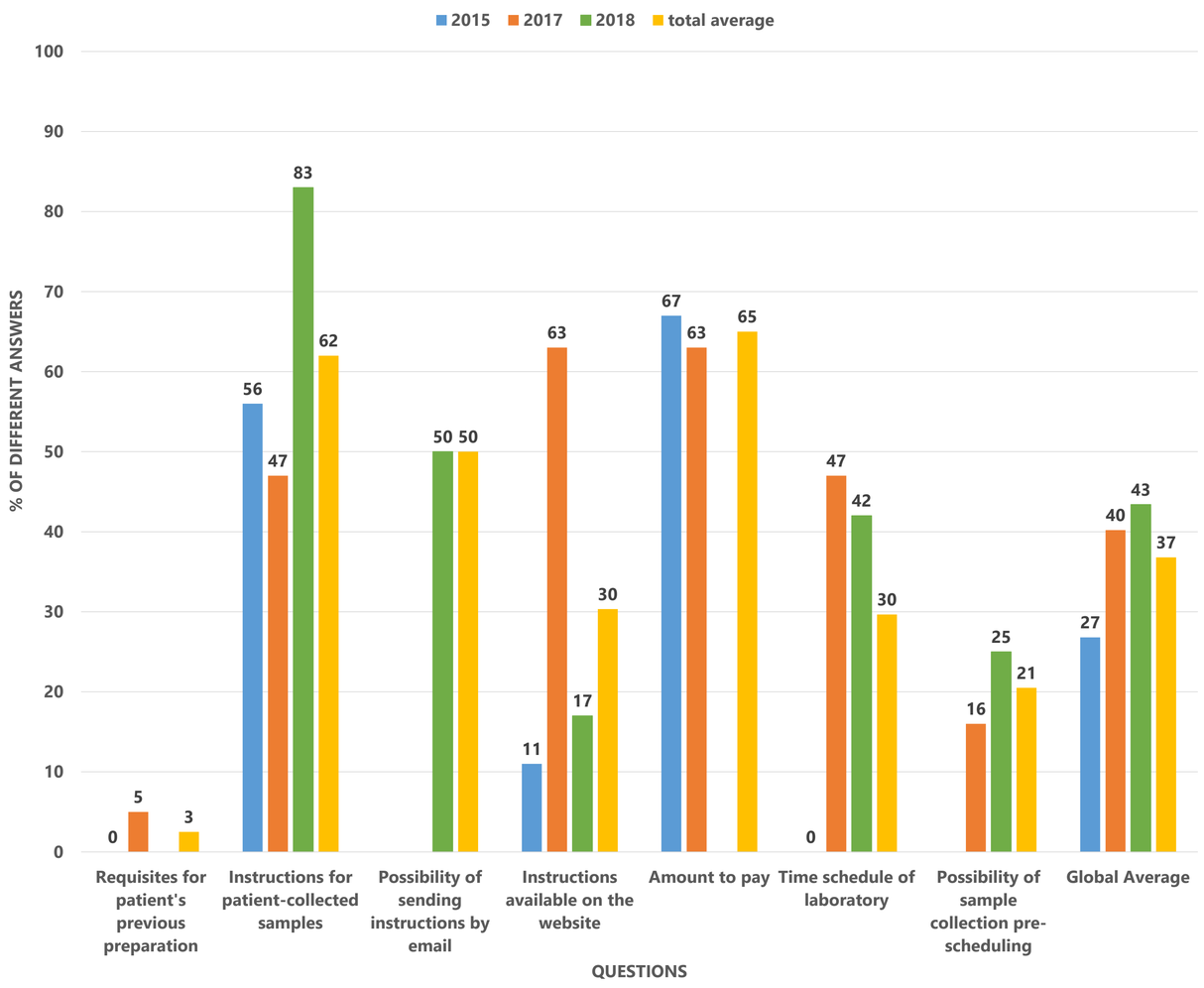


Figure 1 – Example of the "interview" guide performed in the 2018 round.

Results

Graphic 1 represents the results obtained from Mystery Client surveys distributed in 2015, 2017 and 2018. The 2019 survey will be conducted in the 4th quarter. The annual participation rate was 75% in 2015, 95% in 2017 and 63% in 2018.



Graphic 1 – Distribution of results obtained in Mystery Client surveys performed in 2015, 2017 and 2018. *Note: bars with no data means that the item was not included in the "interview".*

Presential Audit

Methodology

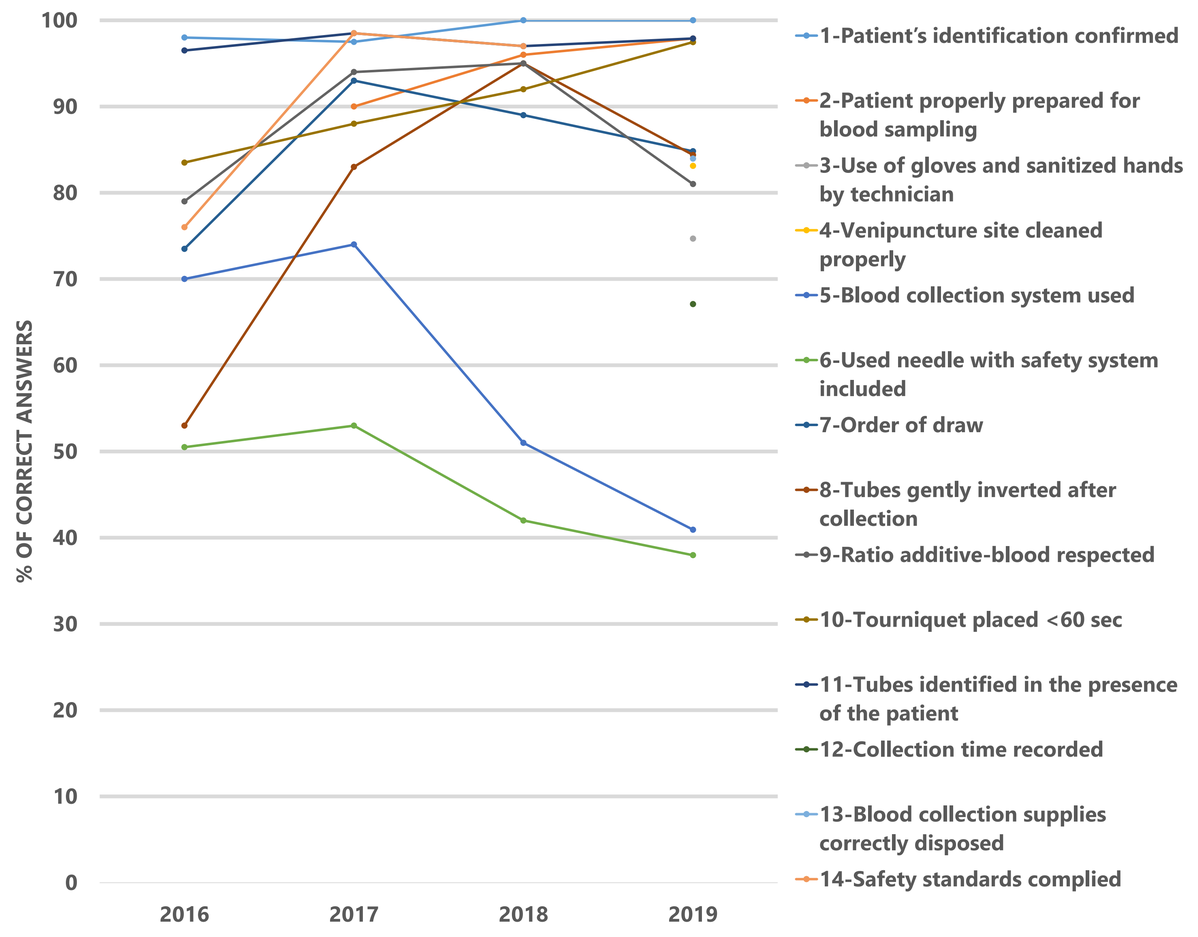
The first checklist for presential audits was launched in 2016. The checklist (Figure 2) was updated four times based on observed difficulties and incomplete or inconsistent results obtained. The audits are performed in two rounds (except in 2018, only with one round) by a laboratory collaborator with competence and training in these matters. In each round, the auditor should attend to the collection of five blood samples by eight technicians (when possible). Audits should be performed within no more than two weeks to ensure that there are no changes to the procedures. The audits should be performed in two different sites: blood collection sites/outpatient consultation depending on it is a private or public laboratory and in central laboratory. Some questions about the technician basic education, career time, length of service and place of work are also requested. Between the two rounds, participants should provide education to the technicians in order to improve critical points.

Blood sampling	**1st blood collection**	**2nd blood collection**	**3rd blood collection**	**4th blood collection**	**5th blood collection**
1-Patient's identification confirmed? (positive ID)	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
2-Patient properly prepared for blood sampling?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
3-Use of gloves and sanitized hands by technician?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
4-Venipuncture site cleaned properly?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
5-Blood collection system used?	☐Open system ☐Closed system	☐Open system ☐Closed system	☐Open system ☐Closed system	☐Open system ☐Closed system	☐Open system ☐Closed system
6-Used needle with safety system included?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
7-Order of draw?	*(indicate 1st - 6th)*	*(indicate 1st - 6th)*	*(indicate 1st - 6th)*	*(indicate 1st - 6th)*	*(indicate 1st - 6th)*
Blood culture bottle	____	____	____	____	____
Citrate tube	____	____	____	____	____
Plain tube or tube with clot activator	____	____	____	____	____
Heparin tube	____	____	____	____	____
EDTA tube	____	____	____	____	____
Glycolysis inhibitor tube	____	____	____	____	____
8-Tubes gently inverted after collection?					
Blood culture bottle	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Citrate tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Plain tube or tube with clot activator	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Heparin tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
EDTA tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Glycolysis inhibitor tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
9-Ratio additive-blood respected?					
Blood culture bottle	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Citrate tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Plain tube or tube with clot activator	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Heparin tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
EDTA tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Glycolysis inhibitor tube	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
10-How long the tourniquet was placed?	____ seconds	____ seconds	____ seconds	____ seconds	____ seconds
11-Tubes identified in the presence of the patient?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
12-Collection time recorded?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
13-Blood collection supplies correctly disposed?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Notes (ex.: difficult venous blood access, etc.)					

Figure 2 – Checklist used for the blood collection presential audit, distributed in 2019 1st round.

Results

The results obtained over time in the presential audits surveys are shown in Graphic 2. In four years were performed 1617 presential audits in 11 laboratories (annual average). Of the 52 collaborators audited per year (annual average), most of them were biochemical technicians (79%) working in the central laboratory (71%) for 6 or more years (56%) and with a career time equal or superior than 11 years (57%). The annual participation rate was 53% in 2016, 70% in 2017, 60% in 2018 and 67% in 2019.



Graphic 2 – Percentage (annual average) of the results obtained in accordance with good practice (see References) in the presential audits surveys carried out in 2016, 2017, 2018 and 2019, respectively. *Notes: Question 2 was introduced in 2017; questions 3, 4, 12 and 13 were introduced in 2019; question 14 was reworded in 2019*.

Conclusion

- Results from Mystery Client surveys demonstrate the need for written procedures and harmonization of practices for all collaborators, as more than a third of the responses differed in date/time and operator in a global view.
- In the Presential Audit surveys we highlight as critical points the results regarding questions 3, 5 and 6, as they point to specific problems that occurred during the blood collection procedure, such as operator and patient safety, as well as the quality of the sample collected, suggesting the need to review legal and normative issues and to train collaborators.
- Participants who use systematically these two methodologies are monitoring some of the requirements of ISO 15189:2012, namely 4.1.2.6, 4.3, 4.4.1, 4.14, 5.4.2 (both), 5.4.4.2 (mystery client) and 5.1.2, 5.2.2, 5.2.5, 5.3.2.5, 5.3.2.7, 5.4.4 (presential audit), contributing to release reliable results for medical decisions.
- For the future, we will extend the questions and items in evaluation in these two surveys to Microbiology area and continuing to offer training in Preanalytical matters.

References

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