

Analysis of the results from the implementation of quality control program in mammography in Bulgaria

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Introduction

The Bulgarian legislation adopted the requirements of the European protocol for the quality control of the physical and technical aspects of mammography screening in 2005. Since then quality control of the mammography units in the country is mandatory. Initial experience in this kind of measurements is gained.

Purpose

The purpose of this work is to propose optimization measures based on the comprehensive analysis of the Quality control (QC) program implemented in several mammography rooms in Bulgaria.

Materials and methods

The methods described in the national QC protocol for mammography adopting the European protocol were applied. Measurements were performed on 12 typical for the country film-screen mammography units:

- 3 Mammomat (Siemens)
- 2 Melody (Villa)
- 1 Flat E (Metaltronica)
- 1 Italray (Italray)
- 1 Giotto ST (IMS)
- 2 Affinity Lorad (Hologic)
- 1 Mammo Diagnost UC (Philips)
- 1 D-240/DG-40 (TuR)



Results

% of units outside limits
Remedial Suspension

- | | | |
|--|-----|-----|
| • Tube voltage accuracy | / | 25% |
| • Central value of optical density control setting | 45% | 18% |
| • Difference per step of optical density control setting | 77% | / |
| • Object thickness and tube voltage compensation of AEC | 14% | 43% |
| • Short term reproducibility of AEC | 8% | 8% |

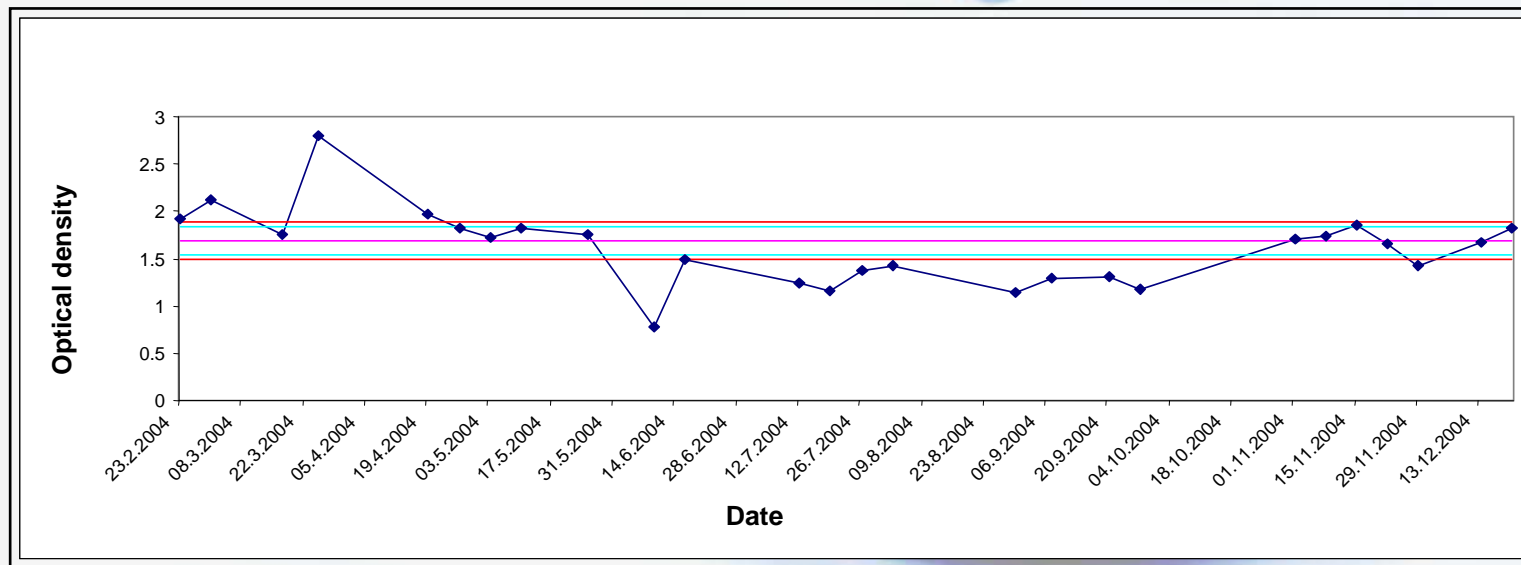
Results

% of units outside limits
Remedial Suspension

• Light tightness of darkroom	60%	/
• Extra fog from safelights	38%	/
• Viewing box luminance	/	100%!
• Viewing box homogeneity	13%	38%
• Ambient light level	25%	/

Results

AEC long term reproducibility
for 3.5 years on unit Flat E

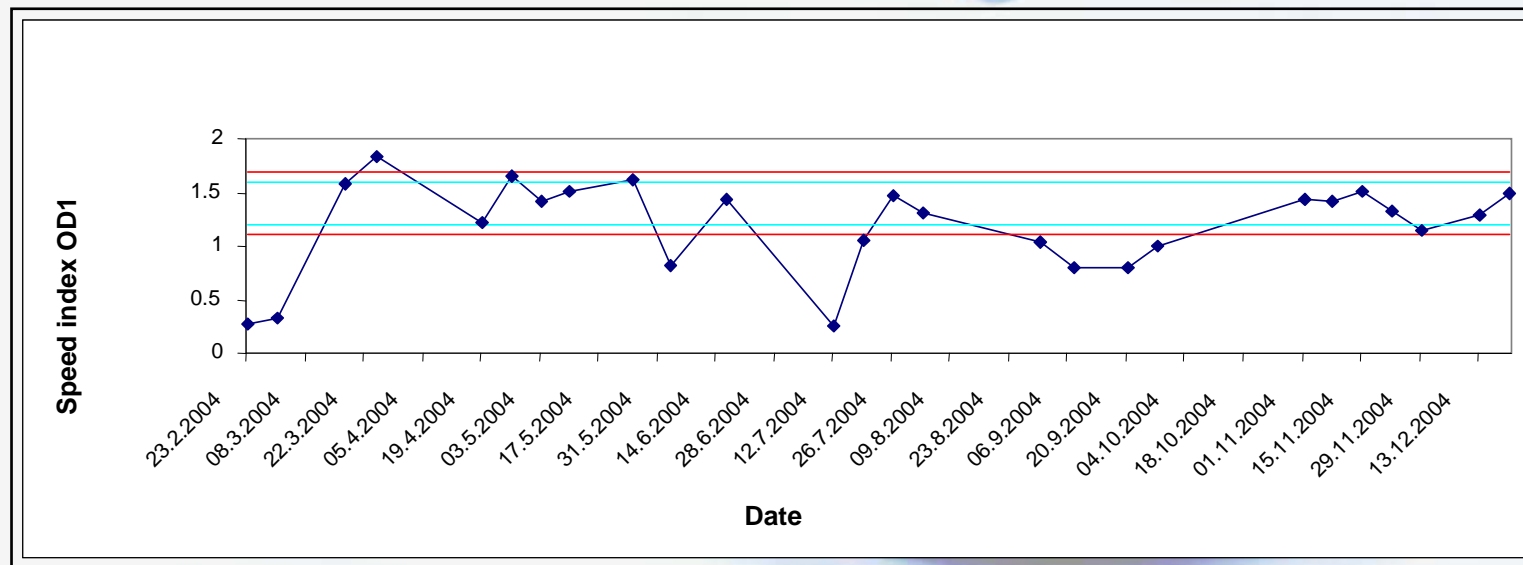


Stable long term reproducibility,
fluctuations are due to film processing



Results

Film processing
for 3.5 years on unit Flat E



Big fluctuations of the sensitometry indexes
mainly due to the slow processor replenishment rate



Conclusions

- The old mammography units type TuR D-240/DG-40 were suspended from clinical use due to the constructive limitations to cover the new requirements.
- Corrective actions were recommended to optimize the settings of some systems and to improve the practice (such as AEC optical density settings, film processor settings, decrease of ambient light level of the darkrooms, change of viewing boxes).
- Improvement was achieved in the performance of some of the mammography units.

Conclusions

- Implementation of the QC program is still ongoing process that needs good understanding and training of the clinical staff. This is particularly important because of the planned introduction of mammography screening in the country in near future.