MOLECULAR MULTITESTING – OVERVIEW OF KEY FACTORS FOR HIGH-QUALITY AND RAPID DIAGNOSTICS

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- Based on years of work and communication with clinicians, Poliklinika Breyer has identified and aimed to implement various factors that simplify and expedite the diagnostic process (**Fig 1**).

- This would greatly improve the experience and outcomes for patients and streamline workflows for clinicians.

- We optimized testing protocol by evaluating multiple transport media and molecular diagnostic platforms to test as many analytes as possible from a single sample.

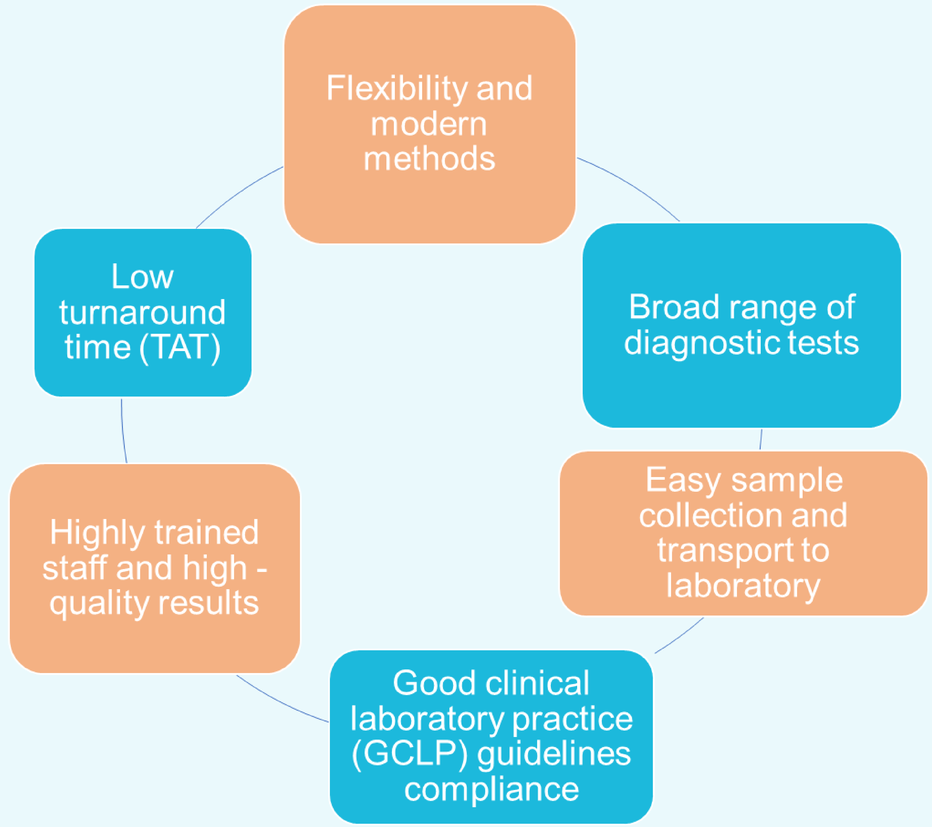

Figure 1. Components of laboratory service that guarantee high-quality and timely reports.

METHODOLOGY

ANALYTES

Human papillomavirus (HPV)

Chlamydia trachomatis (CT)

Neisseria gonorrhoeae (NG)

Trichomonas vaginalis (TV)

Mycoplasma genitalium (MG)

Mycoplasma hominis (MH)

Ureaplasma urealyticum (UU)

Ureaplasma parvum (UP)

OPTIMIZED METHOD

- suitability for various sample types
- room temperature stabilization
- inactivation of pathogens to ensure the safety of medical staff
- rapid and high-quality automated nucleic acid extraction and analysis (**Fig 2**)
- alternative processing technique
- expandable analysis

STATISTICAL ANALYSIS

- internal data from 2023 and 2024
- success rate by the percentage of HPV specimen resampling
- comparison of female (mainly cervical swabs) and male (urogenital region swabs) samples tested for HPV alone, multitested for HPV and CT and multitested for HPV and two or more additional analytes

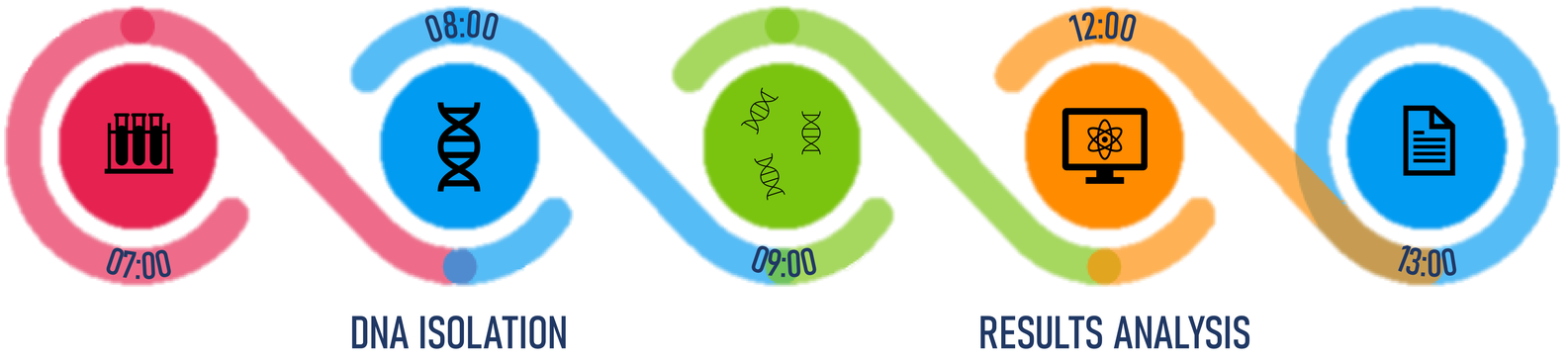

Figure 2. Workflow chart showing main steps in sample analysis from sample collection until reporting of the results.

RESULTS

- High success rate (> 99 %), with very few HPV samples needing resampling (**Fig 3**).
- Polymerase inhibition or low DNA concentration was resolved by alternative processing, leading to successful reanalysis.
- If reprocessing failed, a new sample was requested; PCR allows rapid turnaround time, so results were still delivered on time.

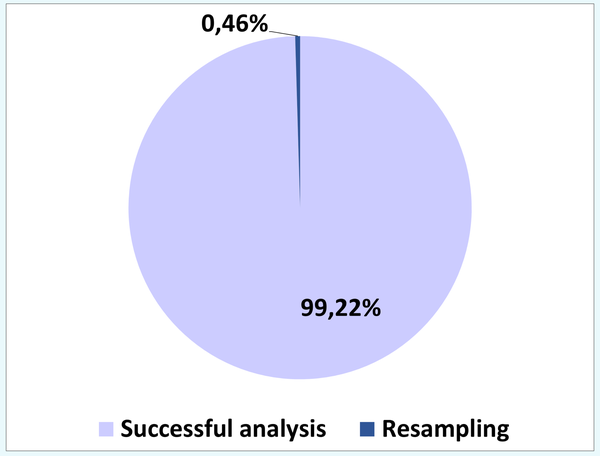

Figure 3. Success rate (%) of analyses for HPV, HPV + CT and HPV + two or more analytes across all samples collected in years 2023 and 2024 (n = 1531).

- Increase in total number of samples tested for HPV, especially female samples (**Fig 4**).
- Most of those were samples collected by gynecologists as they found it convenient to multitest from a single sample.
- Accordingly, in 2024, a rise in multitested samples and greater heterogeneity of requested analytes were observed (**Fig 5**).

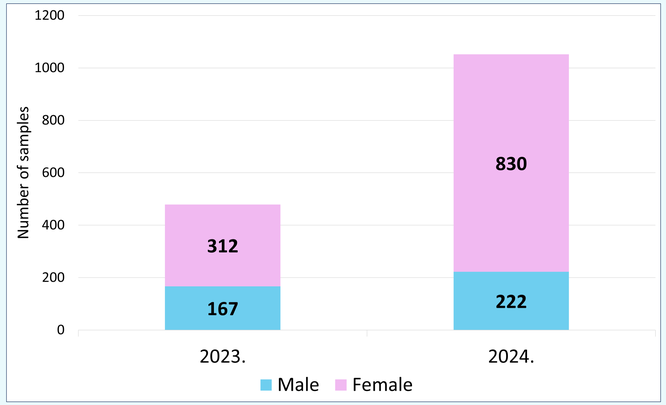

Figure 4. Total number of analysed samples collected in years 2023 and 2024, presented as bars divided by patient sex (male/female).

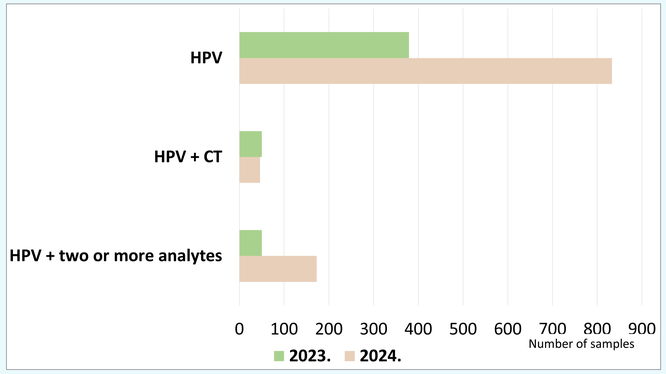

Figure 5. Total number of analysed samples for HPV, HPV + CT, and HPV + two or more analytes between years 2023 and 2024.

CONCLUSION

- Universal medium with easy storage and transport, multitesting and automation **increased** HPV-tested and multitested sample numbers.
- Clinicians can **expand testing** and **re-analyze** problematic samples without repeat sampling, greatly improving **patient comfort**.
- Integration of advanced diagnostics with clinician-focused practices proves **effective** in the private sector.

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