

POST ANALYTICAL PROCESSES

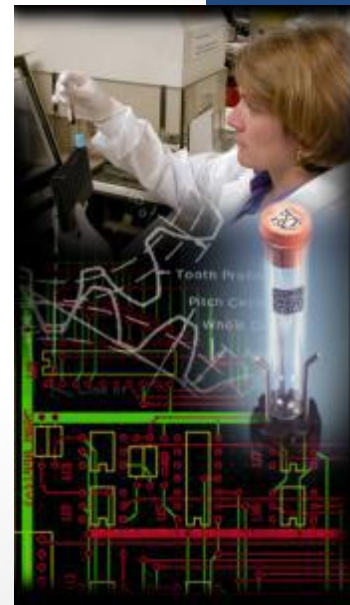
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Introduction

- **Post-analytical quality.**

- This is the ultimate check on the consistency of pre- and intra-analytical quality, and can be considered as the overall quality.

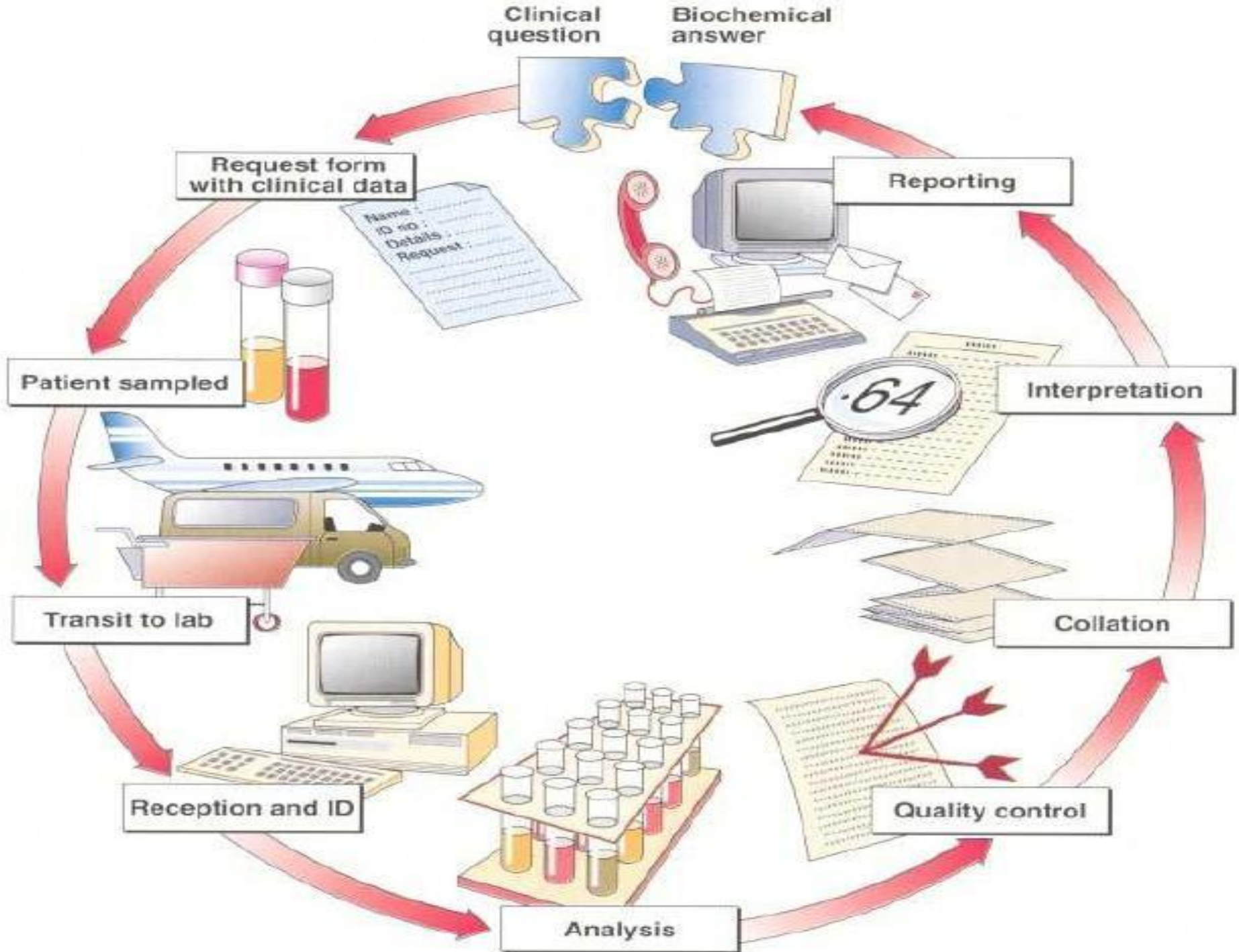


Introduction

- It ties together:
 - the quality of the question to be answered,
 - the analytical quality achieved and
 - the usefulness of the answer obtained, and also
 - the context of the patient and
 - the perceived abilities of the physician to interpret and utilize laboratory information.

Introduction

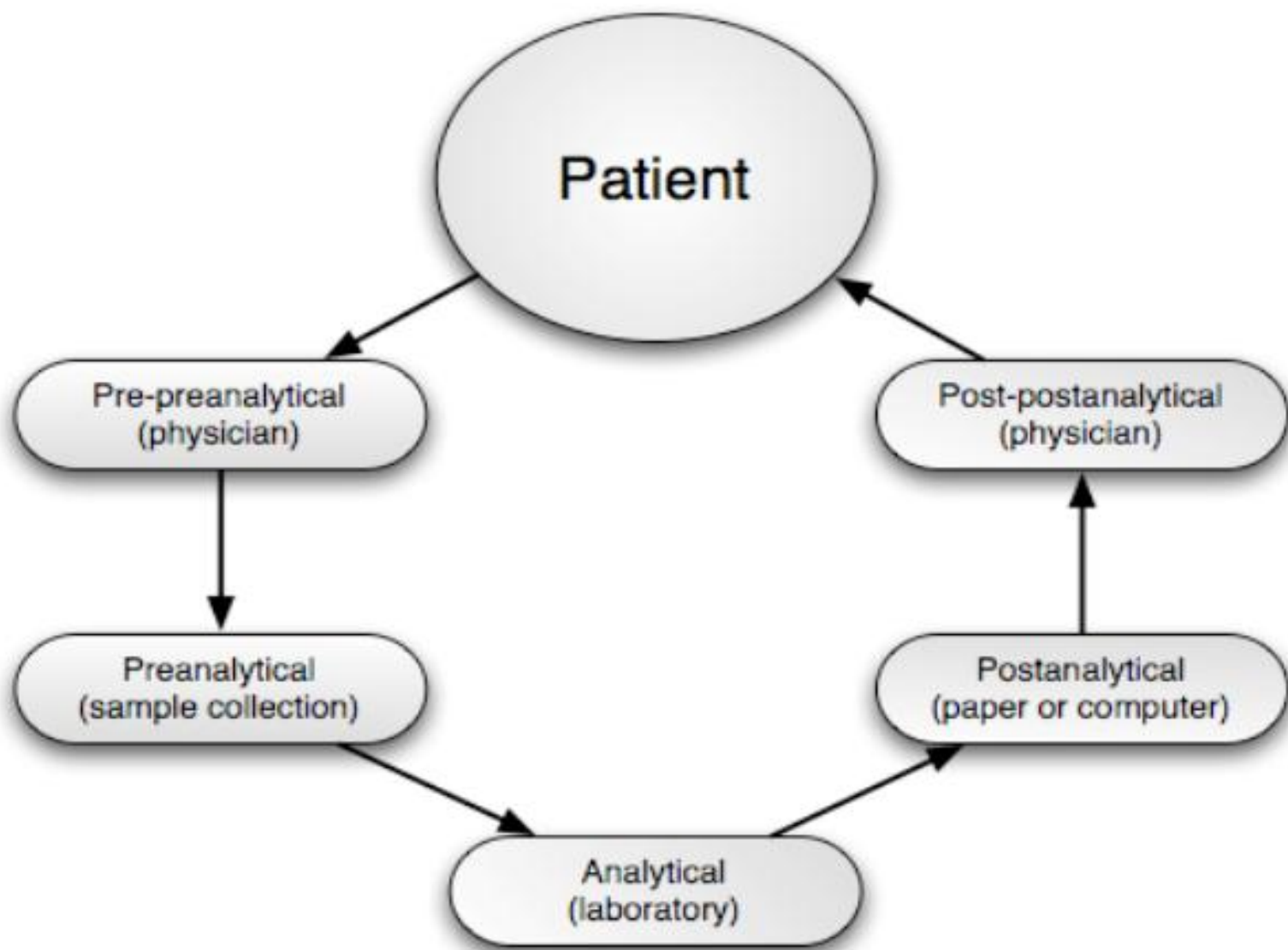
- Similar to the pre-analytical step, the post-analytical phase can be subdivided into:
 - one phase performed within the laboratory and
 - another (post-post-analytical phase) in which the clinicians receive, interpret and react to laboratory results.



Factors influencing quality

Pre analytical	Analytical	Post analytical
Right Specimen	Laboratory professionals	Recording
Right collection	Reagents	Interpretation
Right labeling	Equipment	Turnaround time
Right quantity	Selection of test - SOP	Report to right user
Right transport	Records	
Right storage	Bio-Safety	

The total testing process

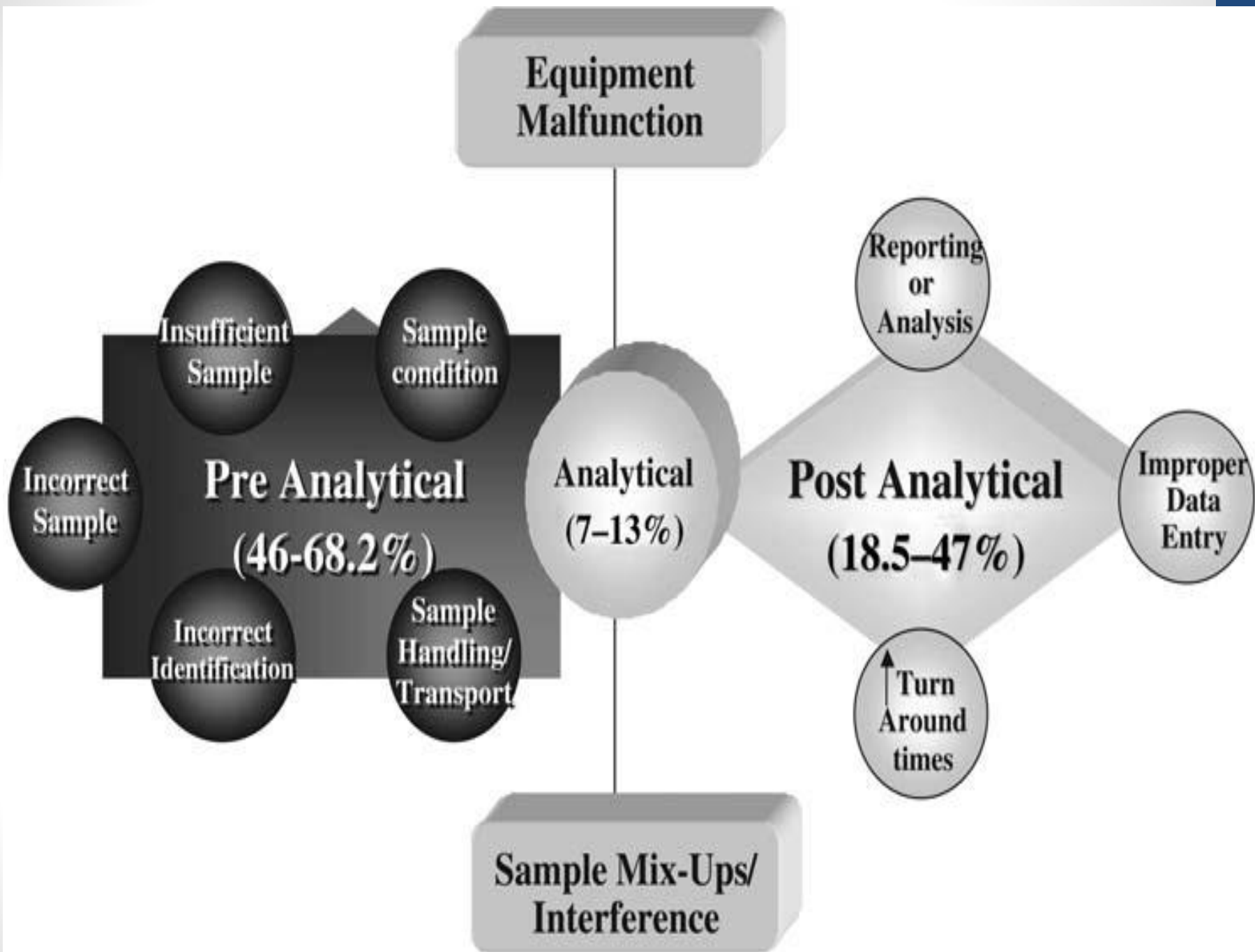


Post analytical procedures

- The post-analytical procedures performed within the laboratory include:
 - verifying laboratory results,
 - feeding them into the laboratory information system, and
 - communicating them to the clinicians in a number of ways (in particular, by producing a report and making any necessary oral communications regarding “alert” or panic results).

Post analytical QC

- Involves:
 - Report generation without any transcription errors
 - Double checking of printed report and counter signed by a pathologist or senior laboratory scientist
 - Report dispatch to right person
 - Storage of reported material
 - Disposal of specimen
 - Monitor TAT



Post analytical errors

- Post-analytical causes of errors accounting for 18.4–47% of total laboratory errors
 - Transcription errors
 - Wrong validation
 - Excessive delay in reporting values
 - Incorrect reference values

- Physician not notified of a panic or critical value
- Incorrect interpretation of lab results by physician
- Incorrect data entry of lab result



- Manual test validation
 - This is a big problem in our environment.
 - This is a time-consuming process with large inter-individual variation;
 - moreover, it slows down the response of the laboratory to the clinic, thus causing delay in the diagnostic and therapeutic process.

- This validation process can be automated; some automated validation systems with satisfactory sensitivity and specificity have been developed and introduced into clinical laboratories.



- For example, if the same person does a manual blood group test on a large number of samples and also run some other tests at the same time, this could lead to errors due to fatigue if the same person has to validate these results.

CASE SCENARIO 1

- O.J. is a 32 year old male who came in for ABO blood grouping test, test was done manually and read as O positive but while transcription was being done it was recorded as A positive. A visual verification was done by the pathologist prior to release of result revealed the error and correct result was documented as O positive.

- In order to avoid transcriptional errors in the results of the test, the reporting/signatory pathologist has to verify the results entered manually or through on-line instrument interfaces before the results are reported or despatched.

- Reference intervals for healthy subjects and diseased populations are important benchmarks for the clinical interpretation of laboratory test values.
- The use of different, sometimes erroneous, reference intervals may markedly affect the clinical interpretation of laboratory data, leading to errors in clinical decision-making

- For example, the reference value for platelets that is used in Nigeria are Caucasian and European values of 150-450 $\times 10^9/L$, but some studies in Western Nigeria have revealed that normal Platelet reference value is lower in Africans, as low as 90 $\times 10^9/L$.
- This could affect clinical interpretation and patient management.

- The production and release of the laboratory report is the crucial step in post-analytical procedures,
 - as its format,
 - content, and
 - communication significantly affect the interpretation and utilization of laboratory data by clinicians.

CASE SCENARIO 2

- Another patient came to a laboratory for a Lipid profile test. A manual transcription of the result was done and instead of transcribing **3.1**mg/dl, the scientist typed in **13.1**mg/dl. The physician on getting the result doubled the dose of simvastatin from 40mg nocte to 160mg nocte. A few weeks later the patient begins to complain of pain in the right upper quadrant, LFTs done were deranged and markedly elevated. Simvastatin was stopped and a careful review of patients results by doctor and the pathologists revealed a transcription error.

- The importance of information technology in improving reliability and security of result reporting is widely recognized.



- Requirements for information technology in laboratory medicine now go well beyond the provision of purely analytical data and include fundamental aspects of data communication, namely the notification of results that fall within established critical or alert intervals

- In particular, the role of interpretative comments in improving patient outcomes has been of interest.
- Guidelines for the provision of interpretative comments have been released and schemes for assessing the quality of comments have been initiated.

- The results obtained indicate that interpretation provided by laboratory professionals with inadequate expertise can be dangerous, and highlight the need for improvement in the standard of interpretation currently provided.

- In the post-analytical phase performed outside laboratory control (post-post-analytical phase):
 - the clinician receives,
 - reads and interprets the results, and
 - makes a decision on the basis of information from the laboratory and other sources.

Post analytical activities

- Review and evaluate the following:
 - Effectiveness of the corrective actions
 - Procedures and policies to prevent recurrences
 - Accuracy and completeness of results and reports
 - Disposition of unacceptable specimens
 - Turnaround times

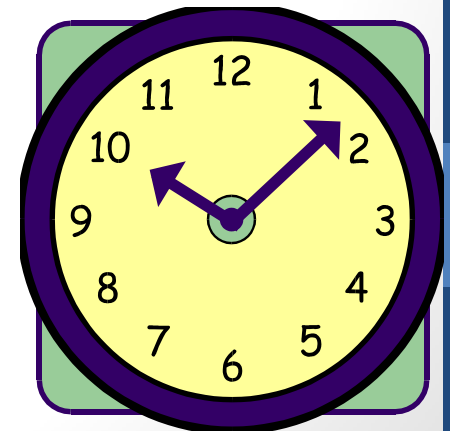
Post analytical activities

- Referral specimens and their reports
- Corrected reports
- Procedures for notification of test results with statistics
- Assurance of confidentiality of patient information



Reporting of results

- Release of reports only to authorized person
- Timely release of provisional and final report
- Any value which exceeds the normal limit must be clearly published, understood and conveyed verbally, electronically or printed form- when, where, what and to whom was reported- document it



Result format



- Name and address of lab
- Name of patient with gender
- Lab ID number
- Date and time of receipt of sample
- Type of sample
- Name of test requested with a brief clinical background
- Results with the units
- The normal or reference range of the test

- Expected turnaround time- if delay, notify the doctor
- Types of reports- standard paper, electronic and web based
- Quality assessment and corrected report monitor and evaluate its results
- If sample was unacceptable- prompt communication

- Interpretation and explanation of the value of result
- Any disclaimers, Eg. SOP on sample rejection criteria
- Value added textual interpretative comments
- Name of the person authorizing the release of the report
- Signature of the person releasing the report

- Treat the patient, not the result.
- If you are in doubt, call the pathologist



Laboratory management – good team work



Resource Materials

- ISO documents:
- 15189



