

Diagnostic Support for the Surgical Patient: The Experiences and Challenges, As Seen by Practitioners in Resource-Poor Setting

Rex Friday Ogoronte Alderton Ijah¹, Nkemsinachi M. Onodingene², Linda U. Iroegbu-Emeruem³, Friday E. Aaron⁴, Michael Ogamba⁵, Akpevweoghene D. Maduka⁶, Ibinabo Oboro⁷

¹Senior Lecturer, Rivers University / Honorary Consultant General Surgeon, Department of Surgery, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

²Senior Lecturer, PAMO University of Medical Sciences / Consultant Hematologist, Department of Hematology & Blood Transfusion Medicine, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

³Senior Lecturer, Rivers University / Consultant Neurosurgeon, Department of Surgery, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

⁴Senior Lecturer, Rivers State University / Consultant Orthopedic and Trauma Surgeon, Department of Surgery, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

⁵Lecturer, PAMO University of Medical Sciences / Consultant Chemical Pathologist, Department of Chemical Pathology, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria.

⁶Lecturer, PAMO University of Medical Sciences / Consultant Hematologist, Department of Hematology & Blood Transfusion Medicine, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

⁷Professor of Medical Microbiology, Rivers State University / Honorary Consultant Clinical Microbiologist, Department of Medical Microbiology, Rivers State University Teaching Hospital, Port Harcourt, Nigeria.

*Correspondence:

Dr. Rex Friday Ogoronte Alderton Ijah, Senior Lecturer, Rivers University / Honorary Consultant General Surgeon, Department of Surgery, Rivers State University Teaching Hospital, Port Harcourt, Nigeria, Tel: +2348033953290.

Received: 02 May 2023; Accepted: 05 Jun 2023; Published: 10 Jun 2023

Citation: Rex Friday O.A. Ijah, Nkemsinachi M. Onodingene, Linda U. Iroegbu-Emeruem, et al. Diagnostic Support for the Surgical Patient: The Experiences and Challenges, As Seen By Practitioners in Resource-Poor Setting. Surg Res. 2023; 5(1): 1-8.

ABSTRACT

Background: The input of laboratory medicine has no doubt improved surgical practice and will continue to impact positively on patient care. The aim of this study was to explore the experiences of practitioners and diagnostic challenges if any, encountered in the care of surgical patients in Port Harcourt in the last quarter of year 2022.

Materials and Methods: A descriptive observational study was carried out among total population of consenting health workers (medical doctors, laboratory scientists / technologists, and technicians) in the Surgery and Diagnostic Services Departments in two teaching hospitals in Port Harcourt, using self-administered questionnaires. Data on experiences and challenges was analysed using the Statistical Package for Social Sciences (SPSS) version 20.0.

Results: The respondents had a male to female ratio of 1.3:1, mean age of 35.47 ± 8.44 years, mean years in practice of 7.58 ± 6.97 years, and 171 (98.3%) were Christians. One hundred and sixteen (66.7%) respondents were aware of delay in diagnostic services, in varying degrees. Lack of reagents (49 = 28.2%), inadequate personnel (18 = 10.3%), long processing time (15 = 8.6%) and poor electric power supply (9 = 5.2%) were the most common reasons for delay in diagnostic test results. Diagnostic challenges were highlighted, occurrence of medico-legal issues was reported, and solutions proffered.

Conclusion: The professionals practicing in the diagnostic / surgical departments were aware and do experience delays in diagnostic test results and errors (reported by a few) that affects surgical services in our environment. Their experiences and challenges were highlighted and recommendations were made.

Keywords

Surgical Patient, Diagnostic Support, Experiences, Challenges, Practitioners, Resource-Poor Setting, Port Harcourt, Nigeria.

Introduction

The discipline committed to analyzing and generating clinical information on the concentration, composition, and / or structure of substances in different biological fluids, is described as laboratory medicine [1,2]. Starting from the 19th century, laboratory medicine has evolved over the years along with other disciplines contributing to decision making in screening, diagnosis, prognostication and therapeutic monitoring of medical conditions [1,3]. Similarly, diagnostic radiology started in 1895 following the works of Wilhelm Roentgen, and has progressed from the first x-ray film of the researcher's wife's hand through film radiography, computed radiography, digital radiography, fluoroscopy, conventional angiography, to the present-day radiology [4]. The addition of other imaging modalities - interventional radiology, magnetic resonance imaging (MRI), ultrasound, high-resolution computed tomography (CT), and digital subtraction angiography, has spiced the work of the professionals in this discipline [5]. The input of these disciplines therefore has no doubt improved surgical practice and will continue to impact positively on patient care. However, laboratory medicine is a discipline that is technology-based, and some challenges have been reported as constraints in Africa, including poor water supply, irregular electricity, dust and vibrations affecting machines, inadequate experienced personnel, etc. [6]. Additionally, most clinical laboratories operational in Sub-Saharan Africa are said not to be accredited to international standards [7,8]. A researcher captured these issues in the following words: ... "to process laboratory specimens locally, and to the highest standards, it will often be necessary to upgrade or entirely refurbish existing laboratories or plant new ones" [9]. Efforts are still ongoing to improve laboratory medicine practice in Africa, and part of such efforts is advocacy for public private partnership [10].

In a study done in Jos Nigeria, incomplete filling of medical laboratory forms was noted as a setback in carrying out effective laboratory medical practice in Nigeria, with a call to adhere to International Standard Organization (ISO) guidelines [11]. Laboratory support was listed among others, as part of the challenges encountered in cardiothoracic surgical practice in Nigeria [12]. Data collected from 22 medical centers in Nigeria in 2017 revealed deficiencies in standardization, quality control, and immunohistochemistry validation of histopathologic cancer specimens in 16 centers, sufficient to affect result reliability [13]. Histopathologic laboratory turnaround time was studied and reported in a study carried out in Jos Nigeria (mean of 7.5+9.7days and a range of 3 – 18days), and setting of realizable targets and regular evaluation were recommended to ensure improvement in quality service [14]. A similar study carried out at the University of Uyo Teaching Hospital reported mean turnaround time to be 8.47 ± 3.34 days [15]. Another study carried out among doctors in public and private health institutions in Nigeria reported the average turnaround time as 5.12hours for emergency

room, 8.35hours for special care baby unit, 7.32hours for intensive care unit, and 8.33hours for the dialysis unit [16]. Laboratory medical practice has a huge impact on patients in modern surgical practice. This study therefore explored the experiences of practitioners in Port Harcourt, establish the challenges encountered in diagnostic support of the surgical patient, and made inferences on what could be done to improve practice in our environment.

Materials and Methods

Research Design

A descriptive observational study was carried out.

Study Area

The study was carried in Port Harcourt the capital of Rivers State, being one of the Niger Delta states in the Federal Republic of Nigeria.

Study Sites

The study sites were the Surgery Department and Diagnostic Departments of the Rivers State University Teaching Hospital and the University of Port Harcourt Teaching Hospital, both of which are public tertiary hospitals in Port Harcourt.

Study Population/Participants

The study participants were medical doctors, laboratory scientists / technologists, and technicians in the above departments.

Sample Size Determination

Total population of consenting surgical staff and workers in the diagnostic departments was used.

Study Instrument

Semi-structured self-administered questionnaire.

Variables

Data was collected on experiences of practitioners on diagnostic support of the surgical patient, challenges encountered by surgical and diagnostic / laboratory practitioners in the care of surgical patients, and suggested solution to challenges.

Bias

The researchers limited this study to practitioners in Surgery Department and Diagnostic Services Departments due to their peculiar interests.

Data Analysis

The obtained data was entered into spreadsheet and formed into tables, using the Statistical Package for the Social Sciences (SPSS) version 23.0.

Validity / Reliability of Study Instrument

The study instrument was scrutinized by all authors and piloted in a different work environment before use. The Cronbach's alpha test was carried out in SPSS during analysis of the piloted questionnaire (value 0.836).

Results

Table 1 shows socio-demographic characteristics of the respondents. A total of 174 respondents were included in the study. There were 97 (55.7%) male and 77 (44.3%) female respondents. The mean age was 35.47 ± 8.44 years, youngest was 20 years and oldest was 64 years. The mean number of years in practice was 7.58 ± 6.97 years, ranging from 1 year to 40 years. One hundred (57.5%) were married and 72 (41.4%) were single. One hundred and seventy-one (98.3%) were Christians. Health workers in five departments had varying proportions of at least 8 different categories of staff.

Table 1: Socio-demographic characteristics of respondents (n = 174).

Variables	Number	Percentage
Sex		
Male	97	55.7
Female	77	44.3
Age in years (Mean= 35.47 ± 8.44, Min= 20. Max =64)		
20 - 30	57	32.8
31 - 40	77	44.3
41 - 50	29	16.7
51 and above	11	6.3
Marital Status		
Single	72	41.4
Married	100	57.5
Others	2	1.1
Number of years in practice (Mean= 7.58 ± 6.97, Min= 1. Max =40)		
1 - 5	89	51.1
6 - 10	46	26.4
11 - 15	21	12.1
16 - 20	8	4.6
21 and above	10	5.7
Religion		
Christianity	171	98.3
Others	3	1.7
Department of practice		
Surgery	35	20.1
Anatomical pathology	14	8.0
Chemical pathology	26	14.9
Medical microbiology	24	13.8
Haematology	33	19.0
Radiology	42	24.1
Category of respondents		
Medical Officer	6	3.4
Registrar	38	21.8
Senior Registrar	22	12.6
Consultant	11	6.3
Director (Laboratory)	2	1.1
Medical laboratory scientist	59	33.9
Laboratory technologist	6	3.4
Radiographers	20	11.5
Others	10	5.7

Practitioners' experiences and diagnostic test results often associated with delay is summarized in Table 2. One hundred and sixteen (66.7%) respondents were aware of delay in diagnostic test results affecting patient care within 2020 – 2022. Sixty-two (35.6%) were aware of more than 6 of such cases of delay, while

41 (23.6%) knew about 1 and 3 cases. Lack of reagents (49 = 28.2%), inadequate personnel (18 = 10.3%), long processing time (15 = 8.6%) and poor electric power supply (9 = 5.2%) were the most common reasons for delay in diagnostic test results. Diagnostic tests / results commonly associated with delay in the care of the surgical patient were full (complete) blood count (63 = 36.2%); serum electrolyte, urea and creatinine (56 = 32.2%), and histopathology test results (40 = 23.0%); Computerized Tomography Scan / Magnetic Resonance Imaging (60 = 34.5%) and X-ray reports (61 = 35.1%).

Table 2: Practitioners' experiences and diagnostic tests often associated with delay (n = 174).

Variables	Number	Percentage
Aware of delay in laboratory results affects patient care within 2020 - 2022		
Yes	116	66.7
No	33	19.0
Not sure	25	14.4
Known cases of delay in laboratory results affecting patient care within 2020 - 2022		
1 - 3	41	23.6
4 - 6	15	8.6
More than 6	62	35.6
No response	56	32.2
Causes of delay in laboratory results		
Lack of reagent	49	28.2
Long processing time	15	8.6
Inadequate personnel	18	10.3
Attitude of laboratory staff/other health workers	8	4.6
Poor power supply	9	5.2
Faulty/Obsolete Equipment	3	1.7
Patient payment issue	5	2.9
No response	67	38.5

Diagnostic test results associated with delay

Variables	Yes		No	
	Number	%	Number	%
Full blood count	63	36.2	111	63.8
Serum electrolyte, Urea and Creatinine	56	32.2	118	67.8
Ultrasound Scan	33	19.0	141	81.0
Histopathology	40	23.0	134	77.0
X-ray reports	61	35.1	113	64.9
CT Scan/MRI	60	34.5	114	65.5

Table 3 shows the experiences in the Anatomical Pathology and Chemical Pathology laboratories. Thirty-six (20.7%) respondents were aware of laboratory errors in anatomical pathology laboratory. While 8 (4.6%) respondents opined that there were more than 6 such cases of errors, 20 (11.5%) indicated only 1-3 cases within the study period. Sample collection error (9 = 5.2%), Technical (9 = 5.2%), and processing (8 = 4.6%) errors were the most reasons for errors in Anatomical Pathology Department, and medico-legal issue was opined by 3 (1.7%) respondents. Likewise, 50 (28.7%) respondents were aware of occurrence of errors in the Chemical Pathology laboratory, and 8 (4.6%) respondents indicated that there were more than 6 such cases of errors, 31 (17.8%) knew about 1-3 cases within the study period. Sample collection error (23 = 13.2%), clerical (7 = 4.0%), and reagent (6 = 3.4%) errors

were the most reasons for errors in Chemical Pathology laboratory, and medico-legal issue was opined by 2 (1.1%) respondents. More than 122 (70.1%) of the respondents did not provide any response on issues of errors and occurrence of medicolegal cases.

Table 3: Experiences in the Anatomical Pathology / Chemical Pathology laboratory (n = 174).

Variables	Number	Percentage
Aware of anatomical pathology laboratory error affecting patient care within 2020 - 2022		
Yes	36	20.7
No	134	77.0
Not sure	4	2.3
Known cases of Anatomical Pathology Laboratory error affecting patient care		
1 - 3	20	11.5
4 - 6	8	4.6
More than 6	8	4.6
No response	138	79.3
Possible causes of Anatomical Pathology Laboratory error		
Sample collection error	9	5.2
Sample storage	2	1.1
Processing error	8	4.6
Reagent error	1	.6
Technical error	9	5.2
Clerical error	4	2.3
All of the above	2	1.1
No response	139	79.9
Medico-Legal issue due to Anatomical Pathology Laboratory error		
Yes	3	1.7
No	24	13.8
Not sure	9	5.2
No response	138	79.3
Aware of Chemical Pathology Laboratory error affecting patient care within 2020 - 2022		
Yes	50	28.7
No	122	70.1
Not sure	2	1.1
Known cases of Chemical Pathology Laboratory error affecting patient care		
1 - 3	31	17.8
4 - 6	11	6.3
More than 6	8	4.6
No response	124	71.3
Possible causes of Chemical Pathology Laboratory error		
Sample collection error	23	13.2
Sample storage	5	2.9
Processing error	4	2.3
Reagent error	6	3.4
Technical error	5	2.9
Clerical error	7	4.0
No response	124	71.3
Medico-Legal issue due to Chemical Pathology Laboratory error		
Yes	2	1.1
No	35	20.1
Not sure	15	8.6
No response	122	70.1

Table 4 summarizes the experiences of respondents in the Hematology / Blood transfusion and Medical Microbiology

laboratories. Sixty-one (35.1%) respondents were aware of occurrence of errors in the Hematology / Blood transfusion. Ten (5.7%) respondents were of the opinion that there were more than 6 such cases, while 40 (23.0%) indicated 1-3. Common causes of errors in the laboratory were storage issues (14 = 8.0%), clerical issues (11 = 6.3%), processing issues (10 = 5.7%), technical issues (10 = 5.7%). Medico-legal issues in Hematology and Blood transfusion laboratory arising from laboratory error was responded positively to by 6 (3.4%). Thirty (17.2%) respondents were aware of occurrence of errors in the Medical Microbiologic laboratory. Five (2.9%) were of the opinion that there were more than 6 such cases, while 17 (9.8%) indicated 1-3. Common causes of errors in the Medical Microbiology laboratory were sample collection (10 = 5.7%) and processing issues (7 = 4.0%). Medico-legal issues in Medical Microbiology laboratory arising from laboratory error was responded positively to by 14 (8.0%). More than 110 (63.2%) of the respondents did not provide any response on issues of errors and occurrence of medicolegal cases in both laboratories.

Table 4: Experiences in the Haematology and Blood transfusion / Medical Microbiology laboratory (n = 174).

Variables	Number	Percentage
Aware of Haematology and Blood transfusion laboratory error affecting patient care within 2020 - 2022		
Yes	61	35.1
No	113	64.9
Known cases of Haematology and Blood transfusion laboratory error affecting patient care		
1 - 3	40	23.0
4 - 6	14	8.0
More than 6	10	5.7
No response	110	63.2
Possible causes of Haematology and Blood transfusion laboratory error		
Sample collection error	8	4.6
Sample storage	14	8.0
Processing error	10	5.7
Reagent error	8	4.6
Technical error	10	5.7
Clerical error	11	6.3
No response	113	64.9
Medico-Legal issue due to Haematology and Blood transfusion laboratory error		
Yes	6	3.4
No	38	21.8
Not sure	19	10.9
No response	111	63.8
Aware of Medical Microbiologic laboratory error affecting patient care within 2020 - 2022		
Yes	30	17.2
No	140	80.5
Not sure	4	2.3
Known cases of Medical Microbiologic laboratory error affecting patient care		
1 - 3	17	9.8
4 - 6	8	4.6
More than 6	5	2.9
No response	144	82.8
Possible causes of Medical Microbiologic laboratory error		
Sample collection error	10	5.7
Sample storage	4	2.3

Processing error	7	4.0
Reagent error	4	2.3
Technical error	4	2.3
Clerical error	1	.6
No response	144	82.8
Medico-Legal issue due to Medical Microbiologic laboratory error		
No	14	8.0
Not sure	20	11.5
No response	140	80.5

Table 5 shows the experiences of practitioners on tests and results in the Radiology Department. Thirty (17.2%) respondents were aware of diagnostic errors affecting patient care. Four (4.0%) were of the opinion that the number of such cases was more than 6, while 18 (10.3%) affirmed that they knew about 1-3. Technical (15 = 8.6%), processing (6 = 3.4%), and clerical (6 = 3.4%) errors were the more common. Three (1.7%) respondents admitted to knowing about medico-legal issues. One hundred and forty-four (82.8%) were unwilling to respond to questions on laboratory errors medico-legal issues.

Table 5: Practitioners' experiences in the Radiology Department (Ultrasound Scan, X-ray, CT-Scan) (n = 174).

Variables	Number	Percentage
Aware of Radiology Department test result (Ultrasound Scan, X-ray, CT-Scan) error affecting patient care within 2020 - 2022		
Yes	30	17.2
No	135	77.6
Not sure	9	5.2
Known cases of Radiology Department test result error affecting patient care		
1 - 3	18	10.3
4 - 6	5	2.9
More than 6	7	4.0
No response	144	82.8
Possible causes of Radiology Department test result error		
Sample collection error	1	.6
Sample storage	3	1.7
Processing error	6	3.4
Technical error	15	8.6
Clerical error	6	3.4
No response	143	82.2
Medico-Legal issue due to Radiology Department test result error		
Yes	3	1.7
No	17	9.8
Not sure	10	5.7
No response	144	82.8

Table 6 summarizes the diagnostic challenges encountered in the care of the surgical patient in the laboratories. Delay / long processing time (66 = 37.9% in Anatomical Pathology; 79 = 45.4% in chemical pathology, 61 = 35.1% in Hematology & Blood Transfusion), electric power supply (32 = 18.4% in anatomical pathology;), and lack of equipment (41 = 23.6% in radiologic laboratory) were the most common challenges. Sixty-nine (39.7%) to 115 (66.1%) did not give any response were unwilling to respond to questions on laboratory errors medico-legal issues in their departments.

Table 6: Challenges encountered while caring for the surgical patient (n = 174).

Variables	Number	Percentage
Challenges encountered at the Anatomical Pathological laboratory		
Lack of equipment/reagents	4	2.3
Delay/Long processing time	66	37.9
Lack of enough personnel	5	2.9
Improper collection of samples	3	1.7
No response	96	55.2
Challenges encountered at the Chemical Pathology laboratory		
Lack of reagents	13	7.5
Delay in patient result	79	45.4
Lack of trained personnel	2	1.1
Wrong sample collection	7	4.0
No response	73	42.0
Challenges encountered at the Hematology and Blood Transfusion laboratory		
Reagents out of stock	18	10.3
Delay/Long processing time	61	35.1
Inability to do FBC on call and weekends	8	4.6
Wrong sample collection	18	10.3
No response	69	39.7
Challenges encountered at the Medical Microbiologic laboratory		
Lack of reagent/equipment	11	6.3
Delay/Long processing time	12	6.9
Inadequate trained personnel	4	2.3
Power supply	32	18.4
No response	115	66.1
Challenges encountered at the Radiology Department		
Lack of Equipment	41	23.6
Delay/Long Processing time	13	7.5
Inadequate trained staff	6	3.4
Poorly filled-out clinical detail by the prescribing doctor	4	2.3
No response	110	63.2

The proffered solution to improving diagnostic support for the surgical patient is summarized in Table 7: Early processing of surgical sample (44 = 25.3% in Anatomical Pathology laboratory), funding and provision of needed materials (43 = 19.5% in Chemical Pathology laboratory), proper sample labelling and identity (39 = 22.4% in Hematology and Blood Transfusion), quick sample processing (13 = 7.5% in Medical Microbiology), employ / train more personnel (22 = 12.6%) and procurement of reagent and modern equipment (14 = 8%) in Radiology Department. One hundred and two (58.6%) to 144 (82.8%) respondents preferred to withhold their responses on solutions.

Table 7: Solution to improve laboratory support for the care of the surgical patient (n = 174).

Variables	Number	Percentage
Suggested solution to improve services at Anatomical Pathological Laboratory		
Procure enough needed materials	1	.6
Early processing of surgical sample	44	25.3
Employ and train technical staff	20	11.5
No response	109	62.6
Suggested solution to improve services at Chemical Pathology laboratory		
Funding and provision of needed materials	34	19.5
Adequate power supply	9	5.2

Employ and train staff	10	5.7
No response	121	69.5
Suggested solution to improve services at Hematology and Blood Transfusion laboratory		
Readily available reagents and tools	17	9.8
Procurement of modern equipment	16	9.2
Proper sample labelling and identity	39	22.4
No response	102	58.6
Suggested solution to improve services at Medical Microbiologic laboratory		
Procurement of reagent and modern equipment	9	5.2
Quick sample processing	13	7.5
Employ and train more personnel	5	2.9
Adequate Power supply	3	1.7
No response	144	82.8
Suggested solution to improve services at Radiology Department		
Procurement of reagent and modern equipment	14	8.0
Quick sample processing	7	4.0
Employ and train more personnel	22	12.6
Privatization	3	1.7
No response	128	73.6

Discussion

Held opinion is a powerful tool for change in almost all spheres of life – politics, administration, health services delivery, economics, religion, etc. [17-20]. However, the quality of opinion also matters when actions are to be taken. In this study, the opinions of the different categories of professionals in the fields of surgery and diagnostic services in public tertiary hospitals in Port Harcourt Nigeria was sought. The ratio of males to females in the study was almost equal (1.3:1), and most respondents were in their prime of age (35.47 ± 8.44 years). Majority of respondents who provided information for the study had worked for at least 7 years (mean years = 7.58 ± 6.97 years). The implication of this information is that the respondents were experienced enough to know about the subject of study. Almost all respondents were Christians (98.3%), while adherents of other religions were 1.7%. This pattern of distribution is similar to observations on religious distribution in Southern Nigerian States [21,22].

Majority of the respondents were aware of delay in diagnostic test results affecting the care of the surgical patient, though its frequency of occurrence was variable. Commonly associated with delay were the results of full (complete) blood count, X-ray reports, Computerized Tomography Scan / Magnetic Resonance Imaging, serum electrolyte, urea and creatinine, and histopathology tests. Delay in diagnostic services results has been a subject of interest globally. Emphasis has been placed on reducing the time between specimen collection and submission to the laboratory – pre-analytic delay whose contribution is significant [23]. The results of two college of American Pathologists review shows that surgical pathology specimens were processed and results delivered in less than a week [24]. Similar studies in Jos Nigeria reported mean turnaround time of $7.5+9.7$ days and a range of 3 – 18 days [14], while that from Uyo Nigeria was mean value of 8.47 ± 3.34 days [15]. However, our experience in our practice is in weeks, and this waiting time partly affect tumor progression. There may be similar experiences in other laboratories. The most common reasons given

for delay in the results of diagnostic test were lack of reagents, inadequate personnel, long processing time, and poor electric power supply in descending order of emphasis. Our findings are similar to earlier report in some other parts of Africa where similar problems exist [6]. However, we expected that thirteen years after the above report was published, we would have outgrown these experiences. One wonders if the problems of use of obsolete / near-modern equipment in Africa earlier reported could have been partly responsible for the long processing time being experienced [9].

The diagnostic challenges encountered by most respondents in this study - long processing time, issues with electric power supply, lack of reagents, inadequate personnel, and lack of equipment – are real and substantially affect the outcome of surgical care and need to be addressed. Similar challenges were reported as affecting cardiothoracic surgical practice, in a nationwide study among institutions in Nigeria performing cardiac surgery [12]. Respondents across the diagnostic departments in varying numbers (1.1% - 8.0%) highlighted their awareness of medicolegal issues arising from laboratory errors within the last three years. Similar awareness / reports of medicolegal issues from laboratory / pathologic medical practice do exist in the global space [25-29]. Even in the Nigerian environment, an author recommended for inclusion of medicolegal issues in the curriculum of students at undergraduate levels, to prime them on how to handle it [30]. In a review of pathologic and laboratory medicine services in low and middle-income countries, challenges and potential medicolegal issues with some content similarities were also highlighted [31].

Majority of the healthcare providers across the departments were unwilling to comment on diagnostic errors and associated medicolegal issues. The sensitivity of the issue may have warranted this attitude of the respondents, and the perceived fear of consequences from such responses and the potential for job loss may explain this behavior. Additionally, the fact that they are aware of the problem of diagnostic test results' delay, and knowing that most of the factors that lead to the delay are administrative in nature (poor electric power supply, lack of reagents, inadequate personnel, etc.) may have been responsible for their being unwilling to make comments. There is also the likelihood that an overstretched (stressed) worker would make some technical mistakes. Occurrence of technical errors following work stress have been reported in previous studies [32-34].

From the foregoing, measures to nip the observed delay / errors in the bud is highly needed to forestall unwanted consequences. The respondents in this study have in their wisdom provided some measures to achieve this. In decreasing order of emphasis, the proffered solution to improving diagnostic support for the surgical patient were indicated as early processing of surgical sample, funding and provision of needed materials, proper sample labelling and identity, quick sample processing, employ / train more personnel, and procurement of reagent and modern equipment.

Study Limitations

Recall bias of respondents, which are peculiar with questionnaire-based research, is a limitation in this study. Additionally, opinion of each respondent cuts across the laboratories and therefore may be lacking in precision.

Conclusion

The professionals practicing in the diagnostic / surgical departments were aware and do experience delays in diagnostic test results and errors that affects surgical services in our environment. The reasons for these experiences are numerous, however the most common ones which also doubles as challenges were lack of reagents, inadequate personnel, long processing time, lack of equipment, and poor electric power supply. Proffered solutions were early processing of surgical sample, funding and provision of needed materials, proper sample labelling and identification, and reduced turnaround time.

References

1. Lippi G. The irreplaceable value of laboratory diagnostics: four recent tests that have revolutionized clinical practice. *EJIFCC*. 2019; 30: 1-7.
2. Lippi G. The origin of some laboratory medicine milestones. *J Lab Prec Med*. 2019; 4: 1-5.
3. Burke MD. Laboratory medicine in the 21st century. *American journal of clinical pathology*. 2000; 114: 841-846.
4. Brant WE, Helms CA. *Fundamentals of diagnostic radiology*. 2012.
5. <https://www.osti.gov/biblio/7162937>.
6. Moshen TD. Cost challenges for laboratory medicine automation in Africa. *The Pan African Medical Journal*. 2010; 6: 22.
7. Schroeder LF, Amukele T. Medical laboratories in sub-Saharan Africa that meet international quality standards. *American journal of clinical pathology*. 2014; 141: 791-795.
8. Gershby-Damet G-M, Rotz P, Cross D, et al. The World Health Organization African region laboratory accreditation process: improving the quality of laboratory systems in the African region. *American journal of clinical pathology*. 2010; 134: 393-400.
9. Okeke IN. Building resources to meet evolving laboratory medicine challenges in Africa. *African Journal of Laboratory Medicine*. 2018; 7: 1-2.
10. Shrivastava R, Gadde R, Nkengasong JN. Importance of public-private partnerships: strengthening laboratory medicine systems and clinical practice in Africa. *The Journal of Infectious Diseases*. 2016; 213:S35-S40.
11. Yakubu JP, Emmanuel OA, Elisha S. Assessment of Patients' Medical Laboratory Request Forms for Compliance in Jos University Teaching Hospital, Jos-Nigeria. *AJBSR*. 2019; 6: 334-339.
12. Falase B, Sanusi M, Animasahun A, et al. The challenges of cardiothoracic surgery practice in Nigeria: a 12 years institutional experience. *Cardiovascular Diagnosis and Therapy*. 2016; 6: S27-S43.
13. Ntiamoah P, Monu NR, Abdulkareem FB, et al. Pathology services in Nigeria: cross-sectional survey results from three cancer consortia. *Journal of Global Oncology*. 2019; 5: 1-9.
14. Emmanuel I, Abaniwo S, Nzekwe P, et al. Laboratory turnaround time of surgical biopsies at a histopathology service in Nigeria. *Nigerian Medical Journal: Journal of the Nigeria Medical Association*. 2020; 61: 180-183.
15. Chukwuemeka CN, Memfin DE. Timeliness of surgical pathology results: A departmental audit of histopathological services. *Sub-Saharan African Journal of Medicine*. 2019; 6: 96-100.
16. Bolodeoku J, Ogbeiwi O, Kuti M, et al. Laboratory tests turnaround time in outpatient and emergency patients in Nigeria: Results of a physician survey on point of care testing. *International Journal of Medical Research & Health Sciences*. 2017; 6: 76-81.
17. <https://psycnet.apa.org/record/1998-07091-034>
18. Zhao Y, Kou G, Peng Y, et al. Understanding influence power of opinion leaders in e-commerce networks: An opinion dynamics theory perspective. *Information Sciences*. 2018; 426: 131-147.
19. Schauer F. Opinions as Rules. *U Chi L Rev*. 1995; 62: 1455-1475.
20. Hopkin CR, Hoyle RH, Toner K. Intellectual humility and reactions to opinions about religious beliefs. *Journal of Psychology and Theology*. 2014; 42: 50-61.
21. Mbakwem-Aniebo C, Ezekoye C, Okonko I. Knowledge about HIV/AIDS, and reported risk behaviours among freshmen of the University of Port Harcourt, Port Harcourt, Southern Nigeria. *World Applied Sciences Journal*. 2012; 16: 1093-103.
22. Zibima SB, Oniso JI, Wasini KB, et al. Prevalence trends and associated modifiable risk factors of peptic ulcer disease among students in a university community south-south Nigeria. *Int J Health Sci Res*. 2020; 10: 97-105.
23. Valenstein PN. Preanalytic delays as a component of test turnaround time. *Laboratory Medicine*. 1990; 21: 448-451.
24. Zarbo RJ, Gephardt GN, Howanitz PJ. Intralaboratory timeliness of surgical pathology reports: results of two College of American Pathologists Q-Probes studies of biopsies and complex specimens. *Archives of Pathology & Laboratory Medicine*. 1996; 120: 234-244.
25. Troxel DB. Medicolegal aspects of error in pathology. *Archives of Pathology & Laboratory Medicine*. 2006; 130: 617-619.
26. Allen TC. Medicolegal issues in pathology. *Archives of pathology & laboratory medicine*. 2008; 132: 186-91.
27. Dighe AS, Makar RS, Lewandrowski KB. Medicolegal liability in laboratory medicine. *Semin Diagn Pathol*. 2007; 24: 98-107.

-
28. Plebani M. Exploring the iceberg of errors in laboratory medicine. *Clinica Chimica Acta*. 2009; 404: 16-23.
 29. Carraro P, Plebani M. Errors in a stat laboratory: types and frequencies 10 years later. *Clinical Chemistry*. 2007; 53: 1338-1342.
 30. Omonisi AE. Medicolegal Cases in Medical Practice. *Nigerian Stethoscope*. 2021; 3: 12-16.
 31. Wilson ML, Fleming KA, Kuti MA, et al. Access to pathology and laboratory medicine services: a crucial gap. *The Lancet*. 2018; 391: 1927-1938.
 32. Lundberg U, Dohns IE, Melin B, et al. Psychophysiological stress responses, muscle tension, and neck and shoulder pain among supermarket cashiers. *Journal of Occupational Health Psychology*. 1999; 4: 245-255.
 33. Arora S, Sevdalis N, Nestel D, et al. The impact of stress on surgical performance: a systematic review of the literature. *Surgery*. 2010; 147: 318-330. e6.
 34. Lundberg U, Frankenhaeuser M. Stress and workload of men and women in high-ranking positions. *Journal of Occupational Health Psychology*. 1999; 4: 142-151.