

## MEDICATION HISTORY DOCUMENTATION IN REFERRAL LETTERS OF CHILDREN PRESENTING AT THE EMERGENCY UNIT OF A TEACHING HOSPITAL IN LAGOS, NIGERIA

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### ABSTRACT

**Background:** Medical literature has demonstrated that referral hospitals often receive inadequate information about the care and medications their patients received from referring hospitals.

**Objectives:** This study aimed to assess the completeness of referral letters, especially the medication history, for patient presenting at the children emergency room of a teaching hospital in Lagos, Nigeria.

**Methods:** A pro forma form was developed to obtain from the referral letters the demographic information of children referred to the emergency room of the Lagos University Teaching Hospital (LUTH), Idiaraaba, over a period of three months. The nature of the referring centre, tentative diagnoses made at the referring centre, duration of illness prior to referral, vital signs and physical examination findings, investigation results, and treatment given were also extracted from the letters. In addition, we extracted from the letters the name, dosage, frequency and duration of use of medicines administered at the referring centres. Parents were also interviewed about the details of medicines used prior to presentation of their child at the referring centres.

**Results:** Among those referred with a letter, 100 patients met the inclusion criteria and constituted those evaluated in this study. Most of the patients were referred from general hospitals (31%), another tertiary hospital (29%), and private hospitals/clinics (24%). Gender (30%) and tentative diagnoses (12%) were omitted in the referral letters. However, information about the weight (82%), vital signs (57%), physical examination findings (44%), treatment given (92%), and medication history (71%) were much more omitted in the referral letters.

**Conclusion:** Medication history as well as many other data points is infrequently reported in referral letters to a tertiary care hospital in Lagos, Nigeria. Standard referral guidelines may be useful to improve documentation of medication history.

**Keywords:** Medication, History, Referral letters, Children, Emergency unit, Tertiary hospital

### INTRODUCTION

Referral letters are the interface between healthcare professionals in the primary healthcare centre or general practice and centres for higher level of care.<sup>1</sup> They are expected to provide information such as the demographics of the patient, the clinical information, and medication history. In addition, they are used by clinical staff and medical records for making appointments for a patient to see a doctor.

A medication history is a detailed, accurate and complete account of all prescribed and non-prescribed medications previously or currently taken by a patient prior to their referral to a higher level of care.<sup>2</sup> Medication history gives useful insights into the allergic

potentials of a patient, adherence to pharmacological and non-pharmacological treatments, social drug use and probable self-medication with complementary and alternative medicines.<sup>3,4</sup> Provision of a detailed medication history; particularly in a referral letter, is critical to the success of diagnostic and patient management processes.<sup>5</sup> This is because medication errors are strongly associated with inadequate or incomplete medication history.<sup>6,7</sup>

Most referral letters are written mainly by physicians and, sometimes, by nurses. However, several studies conducted both in the developed and developing countries showed that a medication history is often

documented inaccurately and incompletely in patients' medical records.<sup>8</sup> It lacks information regarding medication allergies, past prescription, non-prescription medications and patients' adherence to prescribed doses.<sup>9,10</sup> Incorrect and inaccurate documentation of a medication history may result in inadequate or inappropriate use of medications.<sup>11</sup>

Medication history is mainly based on the patient's self-reported information provided at the time of hospital admission in a higher level of care. Often times, it is completely omitted in the referral letter as physicians are more concerned with the medical history of patients than any other relevant details. Inaccurate medication history is often caused by a patient's unreliable memory, non-disclosure by the referring physician, hasty interviews, recording errors, or an interviewer's unfamiliarity with certain medicines.<sup>12</sup> Therefore, it is imperative that the medication history documented in referral letters at the point of admission to another centre, especially tertiary hospital expected to provide further expert management, be evaluated for accuracy.

The literature suggests a lack of a gold standard that constitutes a "good referral letter"<sup>13</sup> and a "good medication history".<sup>8</sup> Formal definition of a good referral letter and a good medication history has not been included in most studies. Gleason *et al*<sup>14</sup> have expressed that healthcare professionals need to educate patients about the significance of providing detailed medication lists and updating the information at every hospital visit. A summary of safe-practice recommendations for reconciling medications at admission has been published in the Joint Commission Journal on Quality and Patient Safety.<sup>15</sup> It is recommended that a complete and accurate list of current medications for each patient should be obtained upon admission. The objective is to develop the most complete medication list possible which may not always be feasible.

Medication history documented in referral letters may not have been evaluated in the developed countries because access to the electronic database of general practitioners by the physicians to whom a patient is referred is permissible in institutionalized hospitals. However, this may not be possible in developing countries where electronic data storage is scarcely available and inaccessible.

The World Health Organization (WHO) has recommended that a referral letter should contain the name and age of the patient, the date and time of referral, the description of the patient's problems, the reason for referral (symptoms and signs leading to

classification), the treatment that has been given, and any other information that the referral healthcare centre may need to know in order to care for the patient, such as earlier treatments of the illness or any immunizations given, in case of children.<sup>16</sup> However, studies in developing countries evaluating the contents of referral letters and the information preferences of physicians receiving the letters are scantily reported in the literature. A study evaluating the content of paediatric referral letters to an emergency room in a University Teaching Hospital in South-Western Nigeria showed that over half of the 974 letters grossly lacked important information such as the patients' age, the treatment given, the findings from the investigations performed, the medical history, and what the writers expect from the referral.<sup>17</sup> The study did not include medication history as one of the contents evaluated. The authors recognised training and introduction of letter-format prompt forms as a means of improving the quality of correspondence between the referring physicians and paediatricians in Nigeria.

This study aimed at evaluating how much medication history is documented in the letters referring children from primary and secondary healthcare centres to the Lagos University Teaching Hospital (LUTH), Idi Araba, in Nigeria.

## METHODS

Although, the study primarily focused on medication history, it was imperative that we examined other important parameters in the referral letters. For completeness of the study, all eligible referral letters were examined and a purposively self-designed pro forma form was used to extract the following information: (i) The child's demographics and anthropometric measurements such as age, gender, weight and height, (ii) nature of the referral centre, (iii) tentative diagnosis made at the referring centres, (iv) investigations ordered, (v) duration of illness prior to referral, (vi) documentation of clinical details such as the vital signs, regional examination findings, results of the investigations ordered and treatment/care given, and (vii) medicines received prior to referral (name of medicine, dosage, frequency of use, duration of use, and route of administration). Another pro forma form was used to obtain information about the actual medicine administered to a child by the caregiver prior to presentation at the referring centres. The two pro forma forms were initially piloted on fifteen children and their caregivers who presented to General Hospital, Surulere. Appropriate corrections and adjustments were made to the forms in line with the problems encountered and suggestions made by the caregivers.

Regional examination refers to the clinical assessment of the chest, abdomen, musculoskeletal, cardiovascular, central nervous and genitourinary systems. Documentation is considered to be partial if the information provided for a range of parameters in the same group is incomplete. For example, vital signs are the parameters measured during a quick evaluation of a patient's general physical condition and include the pulse rate, blood pressure, body temperature, and rate of respiration. Omission of any of these parameters in the referral letter is considered to be partial documentation. Medicine encountered per patient is defined in this study as the number of drug prescribed for a patient at the referring hospital that are documented in the referral letter or the number of drug administered by a caregiver before the patient presented to a referring centre. Centres for higher level of care are where more expertise, skills and facilities are available for better patient care.

A convenience sample of all children with referral letters presenting to the emergency room of LUTH between 8.00 am and 6.00 pm, Monday to Friday, in 15 October to 14 December, 2014, were selected for this study. However, only the referrals that required admission were included and evaluated in this study. The children treated and referred to the outpatient clinic were excluded. The referral letters of the patients were thoroughly reviewed by a postgraduate Master degree student in Pharmacology and validated by a paediatric clinical pharmacologist at the Lagos State University College of Medicine. The estimated inter-rater agreement ( $\chi$ ) was 0.96. Where there were disagreements on the contents of the letters, the view of the third researcher, a pharmacist and clinical pharmacologist at the College of Medicine, University of Lagos, prevailed.

Data were collected prospectively after obtaining the approval of LUTH Research and Ethics Committee. Verbal and written informed consent was obtained from the parent or caregiver of each patient before letter was reviewed. Confidentiality was ensured as no traceable identity of the patients was included in the pro forma.

The Lagos University Teaching Hospital is a tertiary health centre serves as a referral centre for all primary and secondary health centres in Lagos, Nigeria. It also admits children that are self-presenting with their parents. The children emergency room is the point of entry for most of the children who require admission.

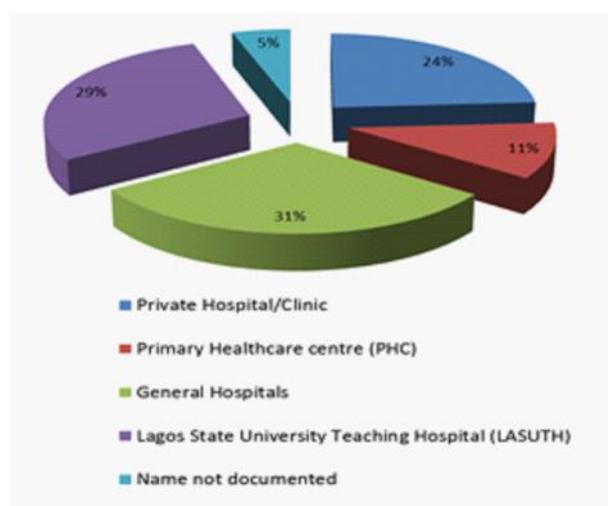
Data were analysed with SPSS 11.0 for Windows (SPSS Inc, Chicago, Ill). Descriptive statistics were done for all variables.

## RESULTS

A total of one hundred patients were evaluated in this study centre. The types of referring centre are presented in Figure 1. Most of the patients were referred from general hospitals (31%), another tertiary hospital (29%), and private hospitals/clinics (24%). Almost all the letters (82%) were written by medical doctors.

The children were of the age 0 - 30 days (39%), 1 - 6 months (7%), 6 - 12 months (48%), and > 12 months (6%). The gender was documented in 70% of the referral letters. More males (65%) than females (35%) were referred to the study centre.

The weight of the patients was not documented in 82% of the referral letters. None of the patients had their height documented in the referral letters. Tentative diagnoses were documented in 88% of the referral letters. Sepsis (14; 15.9%) and perinatal asphyxia (10; 11.4%) were the two most common tentative diagnoses made at the referring centres (Table 1). The duration of illness was documented in 92% of the referral letters.



**Figure 1:** Types of referring centre

All the vital signs were documented in 14% of the referral letters while; at least one of the parameters was documented in 29% of the cases. Over half (57%) of the referral letters had no vital signs documented. Regional examination findings were fully documented only in 11% of the cases. At least one physical examination finding was documented in 45% of the cases, while none was documented in 44% of the cases.

The treatment and care given to the patient was documented in most (90%) of the referral letters. The results of various investigations (laboratory test, ultrasound scan, and radiography) were fully documented in only 10% of the cases. However, they were documented partially in 17% of the cases or not documented at all in 73%.

Medication history was documented in only 19% of the referral letters. Of the 19 patients, 5 were females, 6 were males, and 8 had their gender undocumented. The number of medicine prescribed for each patient documented in the referral letters were one (7), two (6), three (5), and four (1). Only the medications administered at the referring centres were documented,

**Table 1:** Tentative diagnoses made at the referring hospitals.

<b>Tentative diagnoses according to ICD-10-2015-WHO Version*</b>	<b>Frequency (%)</b>
<b>Certain infectious and parasitic diseases (A00-B99)</b>	
(A09.0) Gastroenteritis and colitis of unspecified origin	1 (1.1%)
(A35.0) Other tetanus	2 (2.3%)
(A41.9) Sepsis, unspecified	14 (15.9%)
<b>Neoplasms (C00-D48)</b>	
(C22.2) Hepatoblastoma	1 (1.1%)
<b>Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)</b>	
(D66) Hereditary factor VIII deficiency (Haemophilia NOS)	1 (1.1%)
<b>Mental and behavioural disorders (F00-F99)</b>	
(F20.9) Schizophrenia, unspecified	1 (1.1%)
<b>Diseases of the nervous system (G00-G99)</b>	
(G00.9) Bacterial meningitis, unspecified	5 (5.7%)
(G91.9) Hydrocephalus, unspecified	3 (3.4%)
<b>Diseases of the circulatory system (I00-I99)</b>	
(I64.0) Stroke, not specified as haemorrhage or infarction	1 (1.1%)
<b>Diseases of the respiratory system (J00-J99)</b>	
(J06.9) Acute upper respiratory infection, unspecified	1 (1.1%)
(J18.0) Bronchopneumonia, unspecified	9 (10.2%)
(J94.2) Haemothorax	1 (1.1%)
<b>Diseases of the digestive system (K00-K93)</b>	
(K27.0) Peptic ulcer, site unspecified	1 (1.1%)
(K37.0) Unspecified appendicitis	2 (2.3%)
(K42.9) Umbilical hernia without obstruction or gangrene	1 (1.1%)
(K56.0) Paralytic ileus	1 (1.1%)
(K56.1) Intussusception	5 (5.7%)
(K83.1) Obstruction of bile duct	1 (1.1%)
<b>Diseases of the genitourinary system (N00-N99)</b>	
(N04.0) Nephrotic syndrome	1 (1.1%)
(N39.0) Urinary tract infection, site not specified	1 (1.1%)
<b>Certain conditions originating in the perinatal period (P00-P96)</b>	
(P07.3) Other preterm infants	2 (2.3%)
(P21.9) Birth asphyxia, unspecified	10 (11.4%)
(P53.0) Haemorrhagic disease of foetus and new-born (bleeding disorder)	1 (1.1%)
(P59.9) Neonatal jaundice, unspecified	1 (1.1%)
<b>Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)</b>	
(Q05) Spina bifida	2 (2.3%)
(Q24.9) Congenital malformation of heart, unspecified	2 (2.3%)
(Q30.0) Choanal atresia	1 (1.1%)
(Q42.3) Congenital absence, atresia and stenosis of anus without fistula	1 (1.1%)
(Q79.2) Exomphalos/Omphalocele	3 (3.4%)
<b>Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)</b>	
(R56.0) Febrile convulsions	9 (10.2%)
<b>Injury, poisoning and certain other consequences of external causes (S00-T98)</b>	
(S01.5) Open wound of lip and oral cavity	1 (1.1%)
(T21.0) Burn and corrosion of trunk	1 (1.1%)
<b>Total</b>	<b>88</b>

\* *International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)-2015-WHO Version for the year 2015*

**Table 2:** Medicines documented in the referral letters

Category of medicine documented in the referral letter	Frequency (%)
<b>Antibiotic</b>	<b>18 (50%)</b>
Amoxicillin/clavulanic acid	4 (11.1%)
Ceftriaxone	4 (11.1%)
Cefuroxime	3 (8.3%)
Amikacin	3 (8.3%)
Ceftazidime	1 (2.8%)
Gentamicin	1 (2.8%)
Crystalline penicillin	1 (2.8%)
Metronidazole	1 (2.8%)
<b>Analgesic</b>	<b>5 (13.75%)</b>
Paracetamol	4 (11%)
Ibuprofen	1 (2.75%)
<b>Antimalarial</b>	<b>2 (5.75%)</b>
Camoquine	1 (2.9%)
Artemesinin	1 (2.9%)
<b>Anticonvulsant</b>	<b>6 (16.5%)</b>
Diazepam	3 (8.25%)
Phenobarbitone	3 (8.25%)
<b>Steroidal anti-inflammatory drug</b>	<b>4 (11.25%)</b>
Hydrocortisone	3 (8.4%)
Dexamethasone	1 (2.8%)
<b>Diuretic</b>	<b>1 (2.75%)</b>
Furosemide	1 (2.75%)
<b>Total</b>	<b>36 (100%)</b>

N.B: Only 19 patients had medicines reported and each patient was prescribed more than one medicine.

while those used (self-medicated or prescribed by other people such as nurses, patent medicine sellers and chemists) prior to presentation at the referring centres were not documented at all. The pattern and category of medicines administered to the patients at the referring centres are presented in Table 2. Antibiotics (18; 50%) were the most frequently prescribed group of medicines, followed by anticonvulsants (6; 16.5%). Of the 36 medicines documented in the referral letters, 22 (61.1%) were written without the dosage (mg or mg/kg) or route, frequency and duration of administration.

Forty (40%) caregivers reported to have used some medicines (prescribed or self-medicated) to their children or ward prior to admission at the referring centres. Among these caregivers 29 were males and 11 females. The number of medicine administered to the patient were one (19; 47.5%), two (6), three (7), and four (8). The category and pattern of medicines administered to the patients prior to presenting at the referring centres are as shown in Table 3. Analgesics (32; 39%), followed by antibiotics (22; 26.8%), were the most frequently used medicines prior to admission

**Table 3:** Self-medication provided to the patients by their caregivers before presenting to the referring centres

Category of medicine administered to the patient prior to presentation at the referring centres	Frequency (%)
<b>Analgesic</b>	<b>32 (39%)</b>
Paracetamol	31 (37.8%)
Ibuprofen	1 (1.2%)
<b>Antibiotic</b>	<b>22 (26.8%)</b>
Amoxicillin/clavulanic acid	13 (15.8%)
Cefuroxime	4 (4.9%)
Erythromycin	1 (1.2%)
Pyrantel palmoate	1 (1.2%)
Albendazole	1 (1.2%)
Co-trimoxazole	1 (1.2%)
Metronidazole	1 (1.2%)
<b>Vitamins/Multivitamins</b>	<b>17 (20.7%)</b>
Multivitamins	9 (11%)
Ascorbic acid	5 (6.1%)
Vitamin B-complex	2 (2.4%)
Calcium lactate	1 (1.2%)
<b>Anti-spasmodic</b>	<b>4 (4.8%)</b>
Ipratropium bromide	2 (2.4%)
*Gripe water®	1 (1.2%)
Herbal medication	1 (1.2%)
<b>Antimalarial</b>	<b>3 (3.6%)</b>
Artemether/lumefantrin	2 (2.4%)
Artemesinin	1 (1.2%)
<b>Anticonvulsant</b>	<b>2 (2.4%)</b>
Diazepam	1 (1.2%)
Paraldehyde	1 (1.2%)
<b>Anti-ulcer</b>	<b>1 (1.2%)</b>
Magnesium trisilicate	1 (1.2%)
<b>Anti-asthma</b>	<b>1 (1.5%)</b>
Salbutamol	1 (1.5%)

Note: Gripe water® contains Terpenless dill seed oil, sodium bicarbonate, ginger tincture and alcohol 0.22l ml.

at the referring centres. Of the analgesics, paracetamol (31; 37.8%) was the most predominantly used, while amoxicillin/clavulanic acid was the most frequently used antibiotic.

## DISCUSSION

Referral is defined as any process in which health care providers at lower levels of the health system, who lack the skills, the facilities, or both to manage a given clinical condition, seek the assistance of providers who are better equipped or specially trained to guide them in managing or to take over responsibility for a particular episode of a clinical condition in a patient.<sup>18</sup> In addition, tertiary hospitals in developing countries do not treat only referred patients; they are frequently the first point of contact with health services for many

patients.<sup>19-22</sup> It is therefore expected that the referral centre used for our study will receive referrals from lower levels of care such as private hospitals/clinics and general hospitals. Surprisingly, the referring centres were mostly general hospitals (31%) and a sister teaching hospital (29%). Referral from general hospitals is justifiable while referral from the sister teaching hospital was likely due to lack of bed space for admission. Previous studies have identified this problem as a major reason for inter-hospital referral in Nigeria<sup>23</sup> and other developing countries.<sup>24</sup>

The content of the referral letters was found to be inadequate in most of the aspects evaluated. This does not currently meet the needs of “Good Medical Practice”.<sup>25</sup> Similar findings have been reported in a study that evaluated the contents of referral letters for children referred to the emergency unit of a teaching hospital in Southwest, Nigeria.<sup>17</sup> It is therefore necessary to train healthcare providers on how to write a proper and comprehensive referral letter, as well as introducing letter-format prompt forms, in order to enhance the quality of correspondence between the referring and referral hospitals.

The present study revealed sparse documentation of medication history in the referral letters and involved only the medicines administered at the referring centres. A study that looked into the quality of referral letters from General Practitioners to hospitals in the United Kingdom showed that current and recent medications were documented in 40% of the letters.<sup>26</sup> In the same study, 56% of senior house officers assessed for six items that were important in referral letters but did not recognise medication history as one of the items. Although we did not assess the reasons why medication history was not documented by the referring doctors, a UK-based study suggested a reliance of the young doctors on the comprehensive electronic database of the patients which holds their medication history and is easily accessible.

Lack of accurate and complete information about patients’ medicines when their care is transferred between healthcare settings has been a common patient safety problem globally.<sup>27</sup> In a systematic review conducted by Tam *et al.*, medications used at home were quite different from those used when on admission by two-thirds of the patients.<sup>8</sup> A similar trend may have existed between the medicines used by patients on admission in referring hospitals and after referral, despite being managed for the same ailment. Previous studies have estimated that around half of the medication errors in hospital occur on admission.<sup>28</sup> Around 30% of these errors can potentially cause patient harm.<sup>29,30</sup> “Lack of good

communication between medicine prescribers is a potential risk for medication error”. Medication errors can occur at interfaces of care when prescribing medicines for a patient on transfer from one hospital to another.<sup>30</sup>

Although, medicines administered at the referring centres were documented in only a few of the referral letters, none of those used prior to presentation at the referring centres was documented. Over half of the medicines documented in the referral letters lacked information about their dosages or route, frequency and duration of administration. Given the aforementioned deficiencies and 40% of the caregivers reporting prior use of medicine to their children or ward before admission to the referring centres, the referral letters are considered to be lacking in the completeness of the medication history. Duguid *et al.* once noted that medication history is often incomplete and information about strength, dose, formulation, and use of over-the-counter or complementary medicines, is frequently omitted.<sup>27</sup> Other studies have shown that 10%–67% of medication histories contain at least one error.<sup>8</sup> In hospital, the medication history is essential to make treatment decisions and to identify adverse medicine events in patient care. Incomplete medication history at the time of admission has been cited as the cause of at least 27% of prescribing errors.<sup>31</sup> The most common error is the omission of a regularly used and self-medicated medicine.<sup>29, 32</sup> Erroneous medication histories could lead to untimely discontinuity of therapy, recommencement of ceased medicines, inappropriate therapy and failure to detect medicine related problem.

No medical school is known to teach the art of referral letter writing, so the presence of a form to remind the referring doctor of what constitutes a good referral letter could be valuable. The introduction of a pro forma letter in South African hospitals has been shown to improve the quality of referral letters.<sup>1</sup> This improvement was very significant with diagnosis; however, the study did not evaluate medication history. Introduction of a pro forma letter that includes a section for medication history could serve as a useful tool for improving the quality of referrals. In order to achieve a better level of referral, it is important that referral letters include information such as past medical history, medicines and allergies, investigation results, and findings on physical examinations to help with the admissions process and to aid continuity of management.

The extent to which the convenience sample used in this study actually represents the entire population of children presenting to the study centre with referral

letters over a longer period of time cannot be determined. Ability to capture all the patients presenting over a 24-hour period would have improved the robustness of our data. This is a single centre study; findings may differ from one higher level hospital to another across the nation. Therefore, our data need to be interpreted with caution. We did not ascertain from the parents if the medicines documented in the referral letters were truly administered to their child. This was ignored because most private hospitals/clinics rarely disclose medication information to their patients and often time the patients do not inquire about their medications from healthcare providers.<sup>33,34</sup>

## CONCLUSION

Medication history as well as many other data points is infrequently reported in referral letters to a tertiary care hospital in Lagos, Nigeria. There is need for improvement in the written communication between medical professionals, especially in the areas of pre-hospital medicine and inpatient medicine use at a referring centre. Standard referral guidelines may be useful to improve documentation of medication history.

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