

Research article

## Flexible Gastrointestinal Endoscopy in Nigerian Tertiary Hospitals: An Audit

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### Abstract

**Background:** Endoscopy is an invaluable tool in surgical gastroenterology. The routine practice of flexible gastrointestinal endoscopy is budding in many Nigerian tertiary hospitals. **Aims:** To study the endoscopic capacity, cognitive knowledge and practice of flexible gastrointestinal endoscopy among trainee surgeons in Nigeria. **Materials and method:** A cross sectional study conducted during a 2-week West African College of Surgeons update course in Sep 2017 at Ilorin, Kwara State Nigeria. A structured questionnaire was distributed to registered trainee surgeons. Data collated included demographics, availability of service, brand of endoscopy equipment, experience of trainee in endoscopy, sedation and bowel preparation protocol and limitation to endoscopy practice. Statistical analysis was done using IBM SPSS Statistics for Windows, version 20.0. Armonk, NY. **Results:** There were 131 registered trainee surgeons with 107 respondents from 29 tertiary health facilities. The age range was 29-51 years (mean 34.93±4.19years) from 98 males and 5 females specified. Of these, 22 were Senior Registrars and 85 Registrars. The mean duration of training was 2.5years. Seventy-nine (73.8%) respondents had observed flexible GI endoscopy, 50(46.7%) referred cases for this service and 4(3.7%) trainees performed flexible GI endoscopy. In the 18 centres reported with functional GI unit, service was rendered by surgeons only 2(11.1%), gastroenterologists only 4(22.2%), and a combination of the two in 12(66.7%) centres. **Conclusion:** There is the need for structured training in flexible gastrointestinal endoscopy in Nigeria.

**Keywords:** endoscopy, gastro-intestinal tract, training, Nigeria

### Introduction

There is a significant burden of gastrointestinal disease with a rising incidence of chronic such as non-infectious gastric ulcer disease, cancer, dyspepsia and cirrhosis in West Africa; hence, a resultant increased demand for endoscopic services [1]. The routine practice of gastro-intestinal endoscopy is budding in many Nigerian tertiary hospitals. Gastro-intestinal (GI) endoscopy is a veritable diagnostic and therapeutic tool in surgical gastroenterology so the need for competence cannot be over-emphasized. Competence is defined as the minimal level of skills, knowledge and/or expertise derived through training and experience that is necessary to safely and proficiently perform a task or procedure. In all, measuring the endoscopic pathology present in local populations is not

only invaluable to understanding regional endoscopic demand, but can also be utilized in developing region-specific training curricula [2].

The requisite skills to perform gastrointestinal endoscopy procedures have been traditionally categorized into cognitive, technical, methodological, and communicative abilities. The cognitive skills for GI endoscopy include a knowledge of endoscopic findings (normal and pathological) and their application to clinical practice. Necessary technical skills are related to scope navigation- insertion and withdrawal, mucosal inspection and biopsy techniques [4]. The methodological skills involve understanding the sequence and methods used for routine examination including retroflexion and loop reduction.

An effective communication skill between the endoscopist and his/her assistants is indispensable to efficiency and to understanding patient status. There are guidelines for assessment of competence and technical success of different endoscopic procedures. For example, in oesophagogastroduodenoscopy (OGD) this involves retroflexion, visualization of the second part of the duodenum, performing a minimum specified number of cases and success rate in  $\geq 95\%$  of cases performed [5]. This study aims to assess the knowledge, attitude and practice of GI endoscopy in Nigerian tertiary hospitals with a view to assessing endoscopic capacity and aiding effective treatment of GI diseases.

## Materials and Method

A cross sectional study was conducted during a 2-week West African College of Surgeons examination update course in Sep 2017 at Ilorin, Kwara State Nigeria. A structured questionnaire (appendix...) was self-administered to registered trainee surgeons at the course. The data collated included demographics, availability of service, brand of endoscopy equipment, experience of trainee in endoscopy, sedation and bowel preparation protocol and limitation to endoscopy practice. Statistical analysis was done using IBM SPSS Statistics for Windows, version 20.0. Armonk, NY.

## Results

There were 131 registered trainee surgeons with 107 (81.7%) respondents from 29 tertiary health facilities. The age range was 29-51 years (mean  $34.93 \pm 4.19$  years) from 98 males and 5 females (Table 1). The sex of the responders was not specified in 4 cases. The cadre of trainees was: Senior Registrars 22(20.6%) and Registrars 85(54.2%). The average duration of training was 2.5 years. The listed merits of GI endoscopy by responders are as shown in figure 1. The four most common were: accurate diagnosis 92(86.0%); interventional advantage 85(79.4%); biopsy 70(65.4%); no radiation 25(23.4%). The four most common responses to the demerits of GI endoscopy were: expensive test 60(56.1%); need for special training 32(29.9%); invasiveness of test 28(26.2%); non-ready availability 25(23.4%).

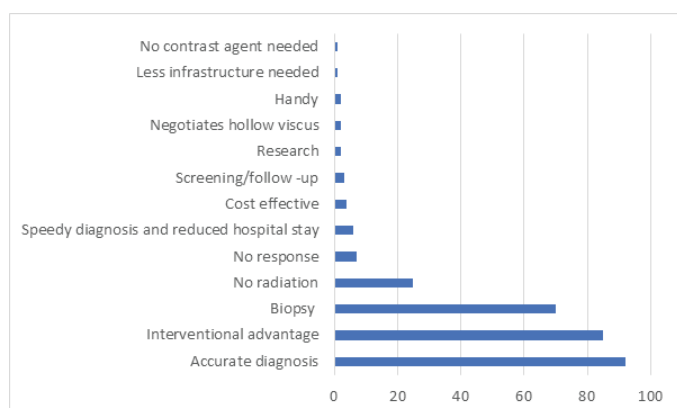


Figure 1. Listed merits of gastrointestinal endoscopy

Table 1. Demographics of study population

Variables	Values
n(population)	131
Responders	107
Age	
Mean	34.9 $\pm$ 4.2 years
Mode	32
Median	34
Sex	
Male	98
Females	5
Not specified	4
Cadre of trainees	
Senior Registrar	22
Registrar	84
Not specified	1
Duration of training (mean)	2.5 years
Tertiary hospitals	29

Most responders did not know the brand of endoscopy equipment in their institution; however, among the major brands Karl Storz (Germany) and Olympus (Japan) were the most common endoscopy equipment. There was record of Pentax (Japan) equipment and Fujinon (Japan) in 2 and 1 centre(s) respectively. In terms of practice, 79(73.8%) respondents had previously observed flexible GI endoscopy (figure 2), 50(46.7%) referred cases for this service and only 4(3.7%) trainees had performed a flexible GI endoscopy procedure. The major sedation /analgesia protocol for upper gastrointestinal endoscopy was conscious sedation with local pharyngeal anaesthesia. For lower gastrointestinal endoscopy, conscious sedation and analgesia was the most common practice (Table 2). A no sedation/no analgesia protocol was a rare practice recorded by 5(4-75) and 3(2.8%) for upper and lower GI endoscopy respectively. In the 18 centres reported with functional GI unit, service was rendered by surgeons only 2(11.1%), gastroenterologists only 4(22.2%), and a combination of the two in 12(66.7%) centres (Table 3). There was a near even distribution of physician and surgeon endoscopist- 19 and 18 respectively.

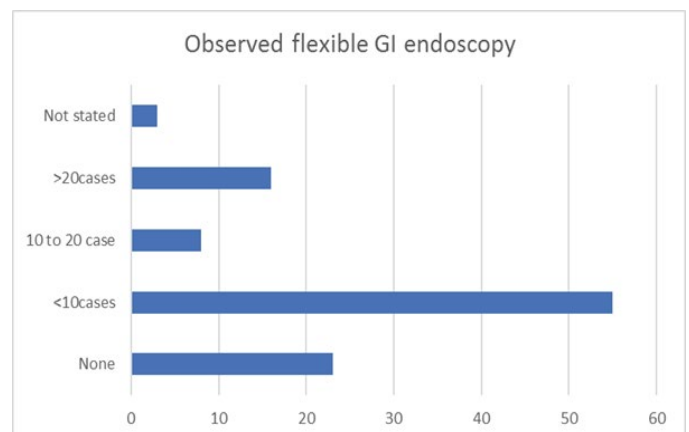


Figure 2. Observation GI endoscopy cases by trainees

**Table 2.** Sedation / analgesia practice of flexible GI endoscopy

Procedure	Sedation/analgesia protocol	Frequency	%
Upper GI endoscopy	Conscious sedation and local anaesthesia	64	59.8
Lower gastro-intestinal endoscopy	Conscious sedation only	32	29.9
	No sedation	5	4.7
	General anaesthesia	1	0.9
	Not stated	5	4.7
	<b>Total</b>	107	100
	Conscious sedation and analgesia	37	34.6
	Conscious sedation only	32	29.9
	Analgesia only	10	9.3
	General anaesthesia	4	3.7
	No analgesia or sedation	3	2.8
	Not stated	21	19.6
	<b>Total</b>	107	100

## Discussions

Gastrointestinal endoscopy is important in diagnosis, treatment, screening and surveillance of many diseases of the digestive tract.<sup>4</sup> This study suggests an adequate endoscopy capacity, especially for training, as 18(62.1%) of the tertiary hospitals represented were reported as having functional endoscopy units. The key considerations to an efficient endoscopy service are functional/well-maintained endoscopy equipment and infrastructure; requisite endoscopic skills; and a team of personnel comprising anaesthetists, endoscopy nurses and technicians. Surgeon endoscopists represented 44.5% of the GI endoscopy workforce of the endoscopy units represented in this study; a welcome contribution to this traditionally physician dominated practice. There was, however, a non-complimentary low level of trainee surgeons without observational exposure or competence in this practice despite 2.5 years mean duration of training. Only 4 responders had performed GI endoscopy unassisted and 23(21.5%) previously observed endoscopy cases. This yawning gap cannot be explained by this study hence a need to bridge it.

**Table 3.** Endoscopic capacity of Nigerian hospitals from respondents

S/No	Hospital	City	State	Responders (n/N%)	Routine service	Endoscopist(s)*
1	JUTH	Jos	Plateau	13(12.1%)	Yes	P/S
2	FMC Yola	Yola	Adamawa	1(0.9%)	No	P
3	Ondo State Trauma Centre	Ondo	Ondo	3(2.8%)	Yes	S
4	LASUTH	Lagos	Lagos	3(2.8%)	Yes	P/S
5	UCH Ibadan	Ibadan	Oyo	2(1.9%)	Yes	P/S
6	FMC Asaba	Asaba	Delta	3(2.8%)	Yes	P
7	UATH	Gwagwalada	FCT**	6(5.6%)	Yes	P
8	OAUTH	Ile-Ife	Osun	7(6.5%)	Yes	P/S
9	FMC Bida	Bida	Niger	2(1.5%)	No	None
10	NO Lagos	Lagos	Lagos	2(1.9%)	No	None
11	AKTH	Kano	Kano	4(3.7%)	Yes	P
12	Usman Dan Fodio UTH	Sokoto	Sokoto	1(0.9%)	Yes	P/S
13	UNTH	Enugu	Enugu	6(5.6%)	Yes	P/S
14	Ekiti State UTH	Ado-Ekiti	Ekiti	2(1.9%)	No	P
15	National Hospital Abuja	Abuja	FCT	4(3.7%)	No	S
16	University of Uyo TH	Uyo	Akwabom	1(0.9%)	No	P
17	Babcock UTH	Ilesha-Remo	Ogun	2(1.9%)	Yes	P
18	Ladoke Akintola UTH	Osogbo	Osun	4(3.7%)	No	S
19	FMC Katsina	Katsina	Katsina	5(4.6%)	No	S
20	ESUTH	Enugu	Enugu	1(0.9%)	Yes	S
21	LUTH	Lagos	Lagos	2(1.9%)	Yes	P/S
22	OOUTH	Sagamu	Ogun	1(0.9%)	No	None
23	NAUTH	Nnewi	Anambra	1(0.9%)	Yes	P/S
24	IMSUTH	Orlu	Imo	1(0.9%)	Yes	P/S
25	BSTH	Makurdi	Benue	1(0.9%)	Yes	P/S
26	FETHA	Abakiliki	Ebonyi	4(3.7%)	No	None
27	UITH Ilorin	Ilorin	Kwara	6(5.6%)	Yes	P/S
28	FMC Keffi	Keffi	Nassarawa	5(4.7%)	No	S
29	DalhatuAraf Specialist Hospital	Lafia	Nassarawa	4(3.7%)	Yes	P/S
30	Not stated	N/A	N/A	10(9.3%)	N/A	N/A

\* P- Physician, S- Surgeon; \*\* FCT-Federal Capital Territory

A good cognitive knowledge of GI endoscopy is demonstrated by a list of 12 merits and 15 demerits garnered from open ended questions soliciting a list of three merits and demerits of GI endoscopy in the study questionnaire. The most frequent response for merit was accuracy of diagnosis in 92(86.0%) of respondents. Cost-related factors to endoscopy service was adjudged the major demerit by most responders-60(56.1%). The sedation protocol for upper GI endoscopy was reported to be majorly by conscious sedation -89.7% of cases with a further local anaesthesia to pharyngeal mucosa in two-third of these participants. This is reported to be commonly administered by non-anaesthesiologists in Nigeria.<sup>6</sup> A no-sedation/no-analgesia protocol was reported in <5% of response. A similar response was given for the choice of general anaesthesia as the choice for sedation and analgesia. This latter response is highly probably as paediatric surgeons were reported as endoscopist in some centres. The practice of paediatric GI endoscopy is commonly performed under general anaesthesia with propofol.<sup>7</sup>

There are multiple models for GI endoscopy training including the apprenticeship, simulation-based, mechanical model, animal models and virtual reality -computer simulation models.<sup>8</sup> The apprenticeship model involves direct training of endoscopist using a “see one, do one, teach one” approach. The limitations include time management, potential trauma to the patients involved in this trial-and-error culture of skills acquisition with little time for self-reflection or provision of formative feedback. Current literature generally indicates that the use of simulators improves performance of endoscopists, reducing learning curve and enhances safety of patients, especially during the initial phase of training. <sup>9,10,11</sup>The main advantages of ex vivo animal models are a more realistic feel compared with purely mechanical models, the ability to practice endoscopy in a controlled setting, and the cost-effectiveness compared with computer-based simulators. On the other hand, the time needed to prepare the animal model, the need to dispose the tissue, and the different structure of tissue are the main disadvantages.<sup>12</sup> A limitation to this study is that not all Nigerian tertiary hospitals were represented at the workshop for completeness. Also, the non- inclusion for analysis of endoscopy

personnel (endoscopy nurses and technicians) detracts from a comprehensive assessment of endoscopy capacity. Despite these, there is an inferred limited endoscopy training in the represented institutions.

### Conclusion

There is a widespread distribution of endoscopy facility in Nigerian tertiary hospitals yet a low level of competence among trainee surgeons. A curriculum for structured training is needed in Nigeria.

### Conflicts of Interest

Dr Emeka ray-Offor and Professor Nze Jebbin have no conflicts of interest to declare.

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