The university endoscopy unit: The standard of care?

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ABSTRACT: In an attempt to investigate practice patterns of the modern gastrointestinal endoscopy unit, a survey was undertaken in 10 university-affiliated endoscopy units in three Ontario cities. The results showed that there was a wide range of premedications used, and that there was variation in the extent of patient monitoring, the method of endoscope sterilization and the degree of safety precautions. This survey provides information on the 'standard of care' in the university endoscopy unit and provides a framework for discussion for the establishment of guidelines for the modern gastrointestinal endoscopy unit. *Can J Gastroenterol* 1990;4(6):255-258

Key Words: Endoscopy, Monitoring, Safety

L'unité d'endoscopie associée à l'université: Quelle est la qualité des soins?

RESUME: Une enquête a été effectuée auprès de 10 unités d'endoscopie associées aux universités dans trois villes ontariennes, afin de déterminer les profils de la pratique dans l'unité d'endoscopie gastro-intestinale moderne. Les résultats révèlent qu'il existe une vaste gamme de prémédications ainsi qu'une variation dans l'étendue du monitoring des patients, la méthode de stérilisation de l'endoscope, et le degré des mesures de précaution. Cette étude fournit des données sur la qualité des soins dispensés dans les unités d'endoscopie des centres hospitaliers universitaires; elle fournit le cadre des discussions conduisant à l'élaboration des directives destinées au centre d'endoscopie gastro-intestinale d'aujourd'hui.

THE SPECIALTY OF GASTROENTEROLOGY has become increasingly dominated by endoscopic procedures performed in outpatient and inpatient settings in modern endoscopic units

within hospitals. The design and daily function of these units varies depending on personnel, experience, budget and other factors. With the increasing emphasis on quality of care evaluations

and medicolegal issues, the onus is on the practising gastroenterologist to provide a level of safety and service which is comparable to the 'standard of care' available in the community. In an effort to define this standard further, practice patterns in 10 university-affiliated gastrointestinal endoscopy units were studied. This survey reviewed the procedures in 10 different endoscopy units with regard to pre-endoscopy assessment, patient monitoring and safety, and endoscopy hygiene.

METHODS

Ten endoscopy units in university teaching hospitals in three Ontario cities were visited. Data were obtained from senior nursing personnel in the endoscopy unit using a standard questionnaire. Data, therefore, were based on the clinical impression of these personnel, and no formal audit of the facilities or clinical outcomes was performed.

RESULTS

The survey revealed that esophago-gastroduodenoscopy was the most common endoscopic procedure performed with a wide range of variability evident between individual units (Table 1). Similarly, there was considerable variability in the use of pre-endoscopy sedation (Table 2). A pre-endoscopy history was obtained by the nurse in all

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TABLE 1
Patterns of care in university hospital endoscopy units

Procedure	Annual volume of procedures	
	Mean $\pm$ SD	Range
EGD	1815 $\pm$ 339	1018-4758
Colonoscopy	686 $\pm$ 71	347-1094
Flexible sigmoidoscopy	433 $\pm$ 173	114-1055
ERCP	215 $\pm$ 52	88-575

EGD Esophagogastroduodenoscopy; ERCP Endoscopic retrograde cholangiopancreatography

units and vital signs were recorded before and after the procedure. There was considerable variability in patient monitoring, availability of resuscitation equipment, and endoscopic hygiene (Table 3).

DISCUSSION

This survey of university endoscopy units was undertaken to provide information on the standard of care that is being provided in university affiliated endoscopy units. With the increasing use of endoscopy in community hospitals it was anticipated that a survey of the university affiliated units may provide useful information on the current 'standard of care'. No attempt was made to audit individual units formally and in no way do the authors assume that the level of care provided in a university

TABLE 2
Variation in preoperative medication among endoscopy units

Procedure	Medication
EGD	Oral benzocaine spray, diazepam, diazepam, atropine, no systemic medication
Colonoscopy	Diazepam, diazepam, meperidine, pentazocine, morphine, fentanyl, buscopan, glucagon, diphenhydramine
ERCP	Oral benzocaine spray, diazepam, diazepam, buscopan, glucagon, diphenhydramine, atropine

EGD Esophagogastroduodenoscopy; ERCP Endoscopic retrograde cholangiopancreatography

affiliated endoscopy unit is more appropriate than that provided in a modern community hospital.

In no endoscopy unit is a routine assessment of all patients performed by a physician prior to an endoscopic procedure. In most cases, this would seem unnecessary as the physician would have done so in his office. However, some busy physicians will meet the patient for the first time in the endoscopy unit and a short history, particularly of concomitant medical illnesses and medications could enhance the safety of the upcoming procedure.

Parenteral medications are administered to the majority of patients undergoing endoscopic procedures. Previous surveys have reported the incidence of respiratory depression/hypotension to be 0.19 to 0.64 per 1000 endoscopies (1,2) although complications tend to be underestimated. Oxygen desaturation to less than 90% has been shown to occur in up to 29% of gastroscopies, 68% of colonoscopies and 44% of endoscopic retrograde cholangiopancreatographies at some point during the procedure (3-8). The process of endoscopic intubation alone has been suggested to contribute to this desaturation (9). Studies in healthy volunteers and smokers have shown a decrease in P_{aO_2} with meperidine and diazepam plus meperidine but not with diazepam alone (10-12).

The predictive value of pulmonary function studies on oxygen desaturation during endoscopic procedures has been reported in several studies. Patients with severe chronic obstructive lung disease (FEV_1/FVC less than 60%) had a greater incidence of desaturation of more than 7% (4,13). However, even in the patients with oxygen desaturation there was no demonstrable increased morbidity or mortality. Whorwell et al (7) claimed that the FEV_1/FVC was not predictive of a fall in P_{aO_2} but the severity of the underlying obstructive airways disease was not documented. Lieberman et al (4) demonstrated an increased incidence of serious cardiac arrhythmias in patients with oxygen desaturation of greater than 7%; however, another

TABLE 3
Variations in safety precautions among 10 university endoscopy units

Procedure	Number of units
Pre-endoscopy history and physical by physician	0
Pre-endoscopy history by nurse	10
Vital signs	
Pre-endoscopy	10
Post endoscopy	10
Routine patient monitoring during procedure	
Blood pressure/pulse	0
ECG	0
Continuous intravenous access	2
Pulse oximetry	0*
Routine patient monitoring post procedure	
Blood pressure/pulse	10
Continuous recovery room personnel	7
Resuscitation equipment	
CPR equipment on site	4
CPR equipment off site	4
Pulmonary resuscitation equipment on site	6
Endoscope hygiene and safety	
Exclusively immersible endoscopes	2
Uniform cleaning methods for all endoscopes	
Immersible	6
Nonimmersible	4
Selective cleaning for high risk procedures	5

*Pending one unit; ECG Electrocardiograph monitor; CPR Cardiopulmonary resuscitation

study did not demonstrate any correlation between cardiac arrhythmias and P_{aO_2} (14). Although these studies, to this point, have been inconclusive about the relationship between sedation-induced respiratory depression, oxygen desaturation, and endoscopic complications, they emphasize the potential for cardiopulmonary complications during routine endoscopic procedures. Therefore, it is significant that over half of the units surveyed in this study did not have cardiopulmonary resuscitation equipment on site; patient monitoring during the procedure was uncommon; intravenous access was immediately available in the minority of procedures; and three units

had no regular personnel in the recovery area. The use of routine pulse oximetry monitoring is gaining wider acceptance in the operating room and the intensive care unit, and one endoscopy unit surveyed has plans to use this technique to monitor patients during endoscopy. This will require further validation since no study has demonstrated that oximetry or electrocardiographic monitoring has altered the morbidity or mortality associated with endoscopic procedures. Guidelines on the monitoring of patients undergoing gastrointestinal endoscopic procedures by the American Society for Gastrointestinal Endoscopy state that in situations where the individualized needs of the patient indicate that more frequent assessment of cardiac rhythm, blood pressure or oxygen saturation will complement conventional clinical assessment, the use of noninvasive monitoring equipment is appropriate (15).

Universal precautions whereby all blood and secretions are regarded as potentially infectious has been recommended by most hospitals. However, in

practice, the endoscopy of a patient with known acquired immune deficiency syndrome (AIDS) or hepatitis B leads to an increase in anxiety of the endoscopy room personnel and often in alternative methods of sterilization of equipment, such as gas sterilization. Hepatitis B has been reportedly transmitted by an endoscope (16), although the risk of transmission is low (17-19). No case of AIDS has been clearly linked to endoscopic transmission of the human immunodeficiency virus (HIV). Only five of the 10 units surveyed employ a universal cleaning technique regardless of diagnosis. Meticulous physical cleaning of the endoscope is the most important part of the sterilization process (20-22) but is not routinely performed in two of the units surveyed. Nine centres use a minimum of 10 mins of chemical disinfection between procedures. Various disinfectants, primarily alcohols or glutaraldehyde preparations have been demonstrated to inactivate HIV and/or hepatitis B virus (23-26). The practices employed by seven units would satisfy the British Working Party recommendations for

cleaning nonimmersible endoscopes, although only five of 10 units soak the entire immersible instrument between procedures as recommended by this group (22). The use of protective eyewear, masks, gloves and gowns are available in most endoscopic units but are not commonly used. A recent survey of endoscopy room practices in known AIDS cases in the US revealed that only 41% of personnel wore eye protection, 74% wore masks, and 87% wore gowns (27).

In summary, this survey has demonstrated that there is considerable variation in the safety procedures employed in university-affiliated endoscopy units. Safety of the patient and endoscopy room personnel should be of primary concern, but endoscopy room protocols are dependent on time between procedures, endoscopic inventory, hospital budgets and increased understanding of the transmission of infectious diseases. It is anticipated that with further awareness of local and international endoscopic safety procedures, guidelines can be established for the 'standard of care' in the endoscopy unit.

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