

Catriona M. Steele, Ph.D.  
Toronto Rehabilitation Institute  
Toronto, Ontario

Cameron Allen, M.Sc.,  
Saskatoon Health Region  
Saskatoon, Saskatchewan

Jennifer Barker, M.H.Sc.,  
University Health Network  
Toronto, Ontario

Pat Buen, M.A.  
Royal Jubilee Hospital  
Victoria, British Columbia

Adele Fedorak, M.A.  
Calgary Health Region  
Calgary, Alberta

Rebecca French, M.Sc.  
University Health Network  
Toronto, Ontario

Shelley Irvine Day, M.Sc.  
Winnipeg Regional Health  
Authority  
Winnipeg, Manitoba

James Lapointe, M.Sc.  
Cité de la Santé de Laval  
Laval, Québec

Leona Lewis, M.Sc.  
Eastern Health  
St. John's, Newfoundland

Carolyn MacKnight, M.Sc.  
Miramichi Regional Health  
Authority  
Miramichi, New Brunswick

Susan McNeil, M.A.  
Nova Scotia Speech and  
Hearing Centres  
Halifax, Nova Scotia

Julie Valentine, M.A., M.Sc.  
Sunnybrook Health Sciences  
Centre  
Toronto, Ontario

Linda Walsh, M.H.Sc.  
Moncton Hospital  
Moncton, New Brunswick

## ■ Dysphagia service delivery by speech-language pathologists in Canada: Results of a national survey

## ■ La prestation de service d'orthophonie à des personnes dysphagiques au Canada : résultats d'une enquête nationale

Catriona M. Steele  
Cameron Allen  
Jennifer Barker  
Pat Buen  
Rebecca French  
Adele Fedorak  
Shelley Irvine Day  
James Lapointe  
Leona Lewis  
Carolyn MacKnight  
Susan McNeil  
Julie Valentine  
Linda Walsh

### Abstract

In 2006, a committee was formed to develop a new position paper on dysphagia (swallowing disorders) for the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA). In the course of their work, the committee conducted an electronic survey of Canadian speech-language pathologists who practice in the area of dysphagia. The survey explored the contexts in which dysphagia services are provided and identified trends and issues in dysphagia service delivery across Canada. The results of this survey, completed by 396 speech-language pathologists, are reported in this article.

### Abrégé

En 2006, un comité a été formé pour élaborer un nouvel énoncé de position sur la dysphagie (troubles de déglutition) pour l'Association canadienne des orthophonistes et audiologistes (ACOA). Dans le cadre de son travail, le comité a sondé par voie électronique des orthophonistes canadiens qui exercent dans le domaine de la dysphagie. Cette enquête a exploré le contexte dans lequel les services de traitement de la dysphagie sont offerts et a relevé des tendances et des problèmes dans la prestation de ces services au Canada. Les résultats du sondage, auquel 396 orthophonistes ont répondu, sont présentés dans cet article.

**Key words:** dysphagia, swallowing, speech-language pathology, service delivery, survey, practice patterns

## INTRODUCTION

The origins of dysphagia (swallowing disorders) as an area of clinical practice for speech-language pathologists can be traced back to the 1970s, and the subsequent publication of the first edition of Logemann's seminal textbook on the subject in 1983 (Logemann, 1983). In recognition of this rapidly emerging area of practice, CASLPA published its first position paper on the topic of dysphagia in 1995 (Jacobson et al., 1994, 1995). Subsequently in 1998, dysphagia sections were added to CASLPA's Scope and Foundations of Practice document (CASLPA, 1998) and to the national certification examination. The Scope and Foundations of Practice document outlines knowledge and competency expectations for Canadian S-LPs working in the area of dysphagia as well as the components of swallowing service delivery.

Recent annual CASLPA membership surveys have shown strong interest in the development of a new dysphagia position paper. Consequently, a committee of clinicians who work in the area of dysphagia was formed in September, 2005 with this mandate. Representatives from almost every province were included on the committee with the exception of Prince Edward Island and the Territories. In order to understand the current context of dysphagia service delivery by speech-language pathologists (S-LPs) in Canada, the position paper committee conducted a survey of CASLPA members on this topic. The position paper that resulted from this committee has recently been made available (CASLPA, 2007).

## METHODS

A survey containing 100 forced-choice or open text questions was developed and administered to a pilot sample of 100 clinicians who attended a professional development workshop in Toronto in February, 2006. Following a preliminary review of responses to the pilot survey, the survey questions were refined, and a new survey was posted on an internet-based survey site ([www.surveymonkey.com](http://www.surveymonkey.com)) for a 3-month period from April-June, 2006. E-mail notices advertising the survey were circulated to the CASLPA membership, inviting their participation and an advertisement was included in the association's quarterly e-newsletter. The provincial regulatory bodies and associations were also asked to advertise the survey to their

members. A hard copy francophone version of the survey was made available upon request.

## RESULTS

A total of 400 completed surveys were received either by electronic or hard copy between April 1 and June 30, 2006. This number excluded all hard copy responses to the initial pilot survey. Responses from four completed surveys were excluded from subsequent analysis because they were submitted by CASLPA members currently working outside Canada. Based on current membership data, approximately 700 CASLPA members report working in the area of dysphagia. While this figure does not reflect individuals who are not members of CASLPA, it suggests that the survey response rate represents approximately 50% or more of eligible respondents who were approached to participate. Current (2005) Canadian Institute of Health Information estimates suggest that there are a total of 6,331 S-LPs in Canada (CIHI, 2005). This survey therefore reflects responses from approximately 6% of the total Canadian S-LP workforce.

### Response Demographics

Information regarding age and gender was not collected in the survey. Survey respondents were drawn from all 10 provinces and two of the three territories, with both urban and rural representation, as shown by the open circles in Figure 1. Membership in CASLPA and distribution of responses across the provinces and territories is shown in Table 1. It should be noted that while the survey was



Figure 1. Map of Canada showing locations of survey respondents (open circles)

made available in both official languages, there were proportionately fewer responses received from the province of Quebec. Additionally, all respondents in Manitoba resided in the Winnipeg metropolitan area. The conclusions drawn from the survey regarding service delivery patterns may, therefore, not be typical of those provided in Quebec or rural Manitoba.

Survey respondents were asked to describe the type(s) of facility in which they worked (primary workplace), with the opportunity to select more than one facility type, where appropriate. The majority of respondents ( $n = 234$ , 59%)

reported working in acute care hospitals with 31% ( $n = 123$ ) and 30% ( $n = 119$ ) describing their workplaces as inpatient or outpatient rehabilitation facilities, respectively. The breakdown of workplace category across the provinces and territories is shown in Table 2. Within these facilities, respondents reported that the predominant model of service delivery for dysphagia was 5 days per week (Monday to Friday). In 4% of cases ( $n = 14$ ), 7-day-per-week coverage of dysphagia was reported. These situations were reported only in certain provinces. Three individuals in British Columbia and seven individuals in Ontario reported providing 7-day coverage, as did four additional respondents, one each in

Alberta, Saskatchewan, New Brunswick and Prince Edward Island. Further inspection of these data identified that 7-day-per-week coverage was not isolated to major urban communities.

Approximately two-thirds of survey respondents indicated that their primary place of employment was an agency operating across multiple sites or campuses. Overall 37% ( $n = 147$ ) of survey respondents indicated that their primary job involved working in more than one site. Interestingly, 25% ( $n = 99$ ) of the total survey response pool reported that they concurrently held more than one job, and of those working for two employers, approximately one-third of these ( $n = 36$ ) reported working across multiple locations for their second job. The frequency of holding two concurrent positions and working across multiple sites is shown in Table 3.

**Table 1**  
*Distribution of survey respondents by CASLPA membership and province/territory*

Province/Territory	N	CASLPA Members	Non-Members
British Columbia	65	100%	n/a
Yukon	2	100%	n/a
Alberta	69	86%	14%
Northern Territories	1	100%	n/a
Saskatchewan	17	100%	n/a
Manitoba	14	93%	7%
Ontario	130	98%	2%
Quebec	24	83%	17%
New Brunswick	32	91%	9%
Prince Edward Island	5	100%	n/a
Nova Scotia	21	100%	n/a

n/a = not applicable

**Table 2**  
*Distribution of survey respondents by practice setting and province/territory*

Province/Territory	N	Acute Care/ General Hospital	Inpatient Rehabilitation Hospital	Outpatient Assessment Clinic	Outpatient Rehabilitation Facility	Long-Term Care Facility	Palliative Care Program	Community or Home Care Service	Nursing Home/ Home for the Aged	Private Practice	School
British Columbia	65	66%	34%	25%	31%	32%	20%	25%	12%	6%	2%
Yukon	2					50%		50%			
Alberta	69	55%	35%	30%	28%	19%	4%	16%	9%	1%	12%
Northern Territories	1	100%		100%	100%						100%
Saskatchewan	17	53%	12%	24%	24%	18%	6%	12%	18%		12%
Manitoba	14	36%	50%	64%	50%	50%	7%		14%		
Ontario	130	60%	29%	21%	27%	20%	18%	19%	5%	3%	2%
Quebec	24	71%	25%	21%	38%	13%	8%				
New Brunswick	32	53%	31%	28%	31%	3%	16%	28%	28%		16%
Prince Edward Island	5	80%	40%								20%
Nova Scotia	21	52%	24%	33%	29%	10%	5%		5%	14%	14%
Newfoundland and Labrador	16	69%	50%	38%	50%	31%	13%	6%			
TOTAL	396	59%	31%	27%	30%	21%	13%	16%	9%	3%	6%

**Table 3***Work patterns with respect to number of positions held concurrently and frequency of working in multiple locations*

	Primary Employment			Secondary Employment		
	<i>N</i>	Multiple Sites?	Work at >1 Site?	Secondary Employment	Multiple Sites?	Work at >1 Site?
British Columbia	65	57%	43%	22%	9%	3%
Yukon	2	100%	100%			
Alberta	69	49%	42%	25%	13%	13%
Northern Territories	1	100%	100%			
Saskatchewan	17	59%	71%	53%	18%	24%
Manitoba	14	36%	21%	21%		
Ontario	130	62%	29%	31%	9%	8%
Quebec	24	63%	21%	21%	4%	
New Brunswick	32	69%	28%	9%	3%	
Prince Edward Island	5	20%	40%	20%		
Nova Scotia	21	81%	43%	10%	10%	5%
Newfoundland and Labrador	16	88%	50%	38%	6%	13%
<b>TOTAL</b>	<b>396</b>	<b>60%</b>	<b>37%</b>	<b>25%</b>	<b>9%</b>	<b>7%</b>

**Table 4***Speech-language pathology staffing complements reported by survey respondents.*

Province/Territory	<i>N</i>	1 S-LP on staff	2 S-LPs on staff	3 S-LPs on staff	4 S-LPs on staff	5 S-LPs on staff	6-10 S-LPs on staff	11-15 S-LPs on staff	>15 S-LPs on staff	Complement Unknown
British Columbia	65	18%	5%	9%	6%	11%	25%	12%	11%	3%
Yukon	2	50%				50%		50%		
Alberta	69	17%	9%	9%	3%	9%	19%	14%	20%	
Northern Territories	1						100%			
Saskatchewan	17	29%	6%	18%	12%	12%	6%		6%	12%
Manitoba	14	14%	7%				29%	36%	14%	
Ontario	130	12%	8%	8%	10%	5%	22%	15%	17%	4%
Quebec	24	4%	4%	4%	13%	13%	33%	8%	21%	
New Brunswick	32	16%	19%	6%	9%	3%	16%	13%	13%	6%
Prince Edward Island	5	60%		40%						
Nova Scotia	21	10%	5%	24%	5%	19%	10%	10%	14%	5%
Newfoundland and Labrador	16	6%	25%	13%	6%		6%	6%	38%	
<b>TOTAL</b>	<b>396</b>	<b>15%</b>	<b>8%</b>	<b>9%</b>	<b>7%</b>	<b>8%</b>	<b>20%</b>	<b>13%</b>	<b>16%</b>	<b>3%</b>

n/a = not applicable

The majority of survey responses (49%,  $n = 194$ ) were collected from clinicians working for agencies/facilities employing at least six speech-language pathologists. Sole-charge clinicians accounted for 15% ( $n = 59$ ) of the overall responses received, while 33% ( $n = 131$ ) reported working in agencies employing between two and six speech-language pathologists. Speech-language pathology staffing complements are shown by province in Table 4.

Survey respondents were asked to indicate the percentage of their clinical caseloads that involved individuals with dysphagia (Table 5). This revealed that clinicians in regions of the country with fewer speech-language pathologists were more likely to service dysphagia as part of a general caseload (up to 25%), while clinicians in major urban communities were more likely to have dysphagia accounting for 25% or more of their caseload.

**Table 5**  
Percent of caseload dedicated to dysphagia

	N	Caseload: % of cases with dysphagia				
		<10%	10-25%	25-50%	50-75%	>75%
British Columbia	65	22%	3%	23%	22%	25%
Yukon	2	50%				50%
Alberta	69	19%	10%	12%	12%	41%
Northern Territories	1	100%				
Saskatchewan	17	18%		24%	18%	24%
Manitoba	14		21%	14%	29%	36%
Ontario	130	12%	11%	18%	15%	41%
Quebec	24	17%	17%	13%	21%	29%
New Brunswick	32	31%	13%	6%	22%	19%
Prince Edward Island	5	60%		40%		
Nova Scotia	21	43%	14%	10%	29%	
Newfoundland and Labrador	16	13%	38%	13%	13%	25%
<b>TOTAL</b>	<b>396</b>	<b>19%</b>	<b>11%</b>	<b>16%</b>	<b>17%</b>	<b>31%</b>

Overall, 124 respondents (31%) reported caseloads with a predominant focus on dysphagia (75% or more of referrals). This included 12 individuals who reported being sole-charge clinicians in their primary worksite.

Survey respondents were asked to identify the lower and upper age limits for patients seen on their dysphagia caseload. This facilitated the grouping of responses into caseloads that were purely pediatric (upper age limit of 17,  $n = 50$ , i.e., 13% of total), purely adult (lower age limit of 18,  $n = 241$ , i.e., 61% of total), purely geriatric (lower age limit of 65,  $n = 7$ , i.e., 2% of total) or mixed (both pediatric and adult,  $n = 76$ , i.e., 19%); 23 respondents failed to provide any information regarding caseload age limits.

### Clinical Services

The clinical services section of the survey was divided into three sections: inpatient services, outpatient services and community-based/in-home services. Each respondent completed only those sections of the survey pertinent to his or her own work setting and patterns.

#### Inpatient Services

A total of 70% ( $n = 278$ ) of the survey respondents reported that their primary job involved the provision of dysphagia services to inpatients. The majority of these 278 respondents came from acute care facilities (51%,  $n = 142$ ) followed by facilities providing both acute care and inpatient rehabilitation (22%,  $n = 61$ ). A further 16% ( $n = 44$ ) described their work settings as inpatient rehabilitation facilities and the remaining 11% ( $n = 31$ ) worked in long-term care or nursing home settings.

### Swallowing screening

The term *swallowing screening* is generally used to refer to a minimally invasive evaluation procedure that provides quick determination of a) the likelihood that dysphagia exists, b) whether the patient requires referral for further swallowing assessment, c) whether it is safe to feed the patient orally (for the purposes of nutrition, hydration and administration of medication), and d) whether the patient requires referral for nutritional or hydrational support. The majority of screening procedures described in the literature have focused on identifying overt signs of aspiration (Martino, Pron, & Diamant, 2000; Perry & Love, 2001).

In the screening section of this survey, the objective was to investigate the extent to which formal swallowing screening mechanisms are established and operating in Canadian health care facilities and to learn which health care providers are involved in performing screening procedures.

Of the 278 survey respondents working in inpatient health care facilities, 161 (58%) reported that some sort of formal swallowing screening procedure was in place in their primary workplace. The most common form of screening process was a clinical pathway type approach, which involves automatic referral for swallowing assessment of patients who have been recognized to have past or current medical histories of high-risk diagnoses (46% of the time,  $n = 74$ ). The next most-common screening procedures involved asking the patient whether they were experiencing swallowing difficulty (22% of the time,  $n = 35$ ) or general observation for swallowing difficulties during routine or planned oral intake, such as at mealtime (13% of the time,  $n = 21$ ). Observation for cough during water swallows was reported to be used as a screening procedure only 2% of the time ( $n = 3$ ) and evaluation of the gag reflex or pharyngeal sensation were reported to be used less than 1% of the time ( $n = 1$ ). In 16% ( $n = 26$ ) of the cases where formal screenings were reported to be in place, no further detail regarding the type of procedure in use was provided. By far the majority of formal swallowing screening procedures were reported to be performed by nursing staff (75%,  $n = 121$ ). Occupational therapists, speech-language pathologists and clinical dietitians were reported to be directly responsible for performing swallowing screenings 10% ( $n = 16$ ), 8%

( $n = 13$ ) and 4% ( $n = 6$ ) of the time, respectively. Screening by physicians was reported to be the model in only 2% ( $n = 3$ ) of facilities where formal swallowing screening occurred, and the designated professional was not identified in the remaining 2 cases.

### Clinical (“bedside”) swallowing assessments

The clinical (bedside) swallowing assessment (henceforth, CBSA) has been described by the American Speech-Language Hearing Association (ASHA, 2004) as a non-instrumental evaluation that includes a) a case history, b) a review of medical/clinical records and observations, c) a structural and functional assessment of the muscles and structures used in swallowing, d) functional assessment of actual swallowing ability, and e) judgments regarding the adequacy of airway protection and respiratory-swallow coordination. CBSAs may also include an assessment of the effect of alterations in bolus delivery or use of therapeutic postures or maneuvers on the swallow, and may involve the use of low-technology tools such as stethoscopes and oxygen saturation monitors to aid in forming clinical impressions.

In this survey, CBSAs were reported to be a service component provided by the overwhelming majority of the 278 survey respondents who provided inpatient services (99%,  $n = 275$ ). Speech-language pathologists were reported to be the professionals most frequently responsible for CBSAs 80% ( $n = 60$ ) of the time in rehabilitation and long-term care institutions, 82% ( $n = 116$ ) of the time in acute care facilities, and 94% of the time in facilities providing a continuum of care from acute care through rehabilitation ( $n = 57$ ). When the S-LP was not the responsible professional, this role was typically reported to be performed by occupational therapists ( $n = 17$ , 6% of the time across inpatient settings), with rare leadership by clinical dietitians ( $n = 4$ , 1% across inpatient settings). With respect to interdisciplinary collaboration for CBSAs, the assessment was reported to be conducted solo by the responsible profession 36% of the time ( $n = 99$ ); participation by other team members in CBSAs was reported 42% of the time for clinical dietitians ( $n = 116$ ), and 24% ( $n = 66$ ) and 19% ( $n = 52$ ) of the time for occupational therapists and nursing staff, respectively. However, the involvement of multiple professions in CBSAs was reported to be collaborative only 47% of the time ( $n = 130$ ) across all 278 inpatient settings combined and as low as 43% ( $n = 61$ ) in the 142 acute care facilities surveyed.

### Instrumental swallowing assessments

Instrumental swallowing assessments come in two major forms: endoscopic (the Flexible Endoscopic Examination of Swallowing, or FEES) and radiographic (the Videofluoroscopic Swallowing Study, or VFSS). Of the two, VFSS was expected to be in broader use within inpatient health care facilities across Canada due to regulatory restrictions in some provinces around the act of transnasal scope insertion.

FEES was reported to be available in 23% ( $n = 33$ ) and 24% ( $n = 15$ ) of the Canadian acute care and acute-rehab continuum facilities where survey respondents worked. Slightly less access to this procedure (13%,  $n = 6$ ) was reported in rehabilitation facilities and the procedure was reported to be unavailable in long-term care settings. When available (54 respondents), endoscopic swallowing examinations were most commonly reported to be provided either during an otolaryngology appointment with the S-LP observing and participating (33%,  $n = 18$ ) or by the S-LP independently (28%,  $n = 15$ ). The reported involvement of physicians (typically otolaryngologists) in endoscopic swallowing assessments was isolated to facilities with an acute care component. Independent performance of FEES by speech-language pathologists (including scope insertion) was reported 6% ( $n = 3$ ) of the time in rehabilitation facilities and 15% ( $n = 21$ ) and 7% ( $n = 4$ ) in acute and acute-rehabilitation continuum facilities, respectively. A variation on FEES involves the use of a dual-channel endoscope, allowing delivery of a calibrated air-puff through the second channel to allow visual evaluation of mucosal response to sensory stimulation (FEESST). This model of scope was reported to be used in 6% ( $n = 3$ ) of the inpatient endoscopic swallowing examinations described by survey respondents.

From the 278 survey respondents working in inpatient health care facilities, 76% ( $n = 211$ ) reported performing VFSS in their practice. The bulk of VFSS practice was concentrated in acute (57%,  $n = 120$ ) or acute care-rehabilitation continuum facilities (25%,  $n = 53$ ) compared to rehabilitation (15%,  $n = 22$ ) and long-term care facilities (3%,  $n = 6$ ). On-site VFSS equipment was reported to be available 84% ( $n = 177$ ) of the time for those performing the procedure, with a further 11% ( $n = 23$ ) of these clinicians (predominantly from rehabilitation facilities) reporting that they had privileges to attend and perform VFSS at a nearby hospital. Quick access to VFSS for inpatients (within 1 day) was restricted to facilities with an acute care component (17%,  $n = 36$ ), with the median reported wait-time reported as between 2 and 5 working days (54%,  $n = 114$ ). Wait-times of 1 to 2 weeks and 2 to 4 weeks were reported for a further 13% ( $n = 27$ ) and 4% ( $n = 8$ ) of respondents who performed VFSS respectively.

The staffing complement for inpatient VFSS was reported to always include a radiologist or radiology resident 70% of the time ( $n = 148$ ); 9% ( $n = 19$ ) of the reported inpatient VFSS procedures were reported to be performed without a radiologist present. Speech-language pathologists and radiation technologists were reported to be always present for inpatient VFSS 96% ( $n = 203$ ) and 86% ( $n = 181$ ) of the time, respectively, and there were no cases reported where a speech-language pathologist would perform a VFSS with neither a radiologist or a radiation technologist present. Other professions were reported to be predominantly present at inpatient VFSS on an occasional basis. These included occupational therapists (always present: 9%,  $n = 19$ , sometimes present: 25%,  $n = 53$ );

clinical dietitians (always present: 4%,  $n = 8$ ; sometimes present: 33%,  $n = 70$ ); nursing staff (always present: 2%,  $n = 4$ ; sometimes present: 48%,  $n = 101$ ); attending physician (always present: 1%,  $n = 2$ ; sometimes present: 2%,  $n = 4$ ); respiratory therapists (always present: 5%,  $n = 11$ ; sometimes present: 55%,  $n = 116$ ); and physiotherapists (always present: 1%,  $n = 2$ , sometime present: 9%,  $n = 19$ ).

### Intervention

With respect to inpatient dysphagia intervention, survey respondents were asked to indicate the availability of four different kinds of intervention: 1) support for enteral feeding, 2) texture modified oral diets, 3) face-to-face direct treatment to train the use of compensatory or rehabilitative maneuvers, and 4) training and education for caregivers to support the patient in implementing treatment recommendations. All four of these intervention options were reported to be available by at least 82% ( $n = 203$ ) of the 247 survey respondents working in acute care, acute-rehab continuum or rehabilitation facilities. Enteral feeding support (63%,  $n = 20$ ) and face-to-face direct treatment (70%,  $n = 22$ ) were reported to be slightly less available in long-term care facilities. Speech-language pathologists were reported to be the profession most frequently responsible for dysphagia intervention by the overwhelming majority of survey respondents working in inpatient facilities (87%,  $n = 242$ ), with participation by occupational therapists, clinical dietitians and nursing staff reported 11% ( $n = 31$ ), 7% ( $n = 19$ ) and 11% ( $n = 31$ ) of the time, respectively. With respect to the duration of dysphagia intervention, 14% ( $n = 39$ ) of survey respondents in inpatient facilities indicated that the number of sessions provided to patients would vary depending on perceived patient need, with no specified maximum; this response was most commonly seen for respondents working in inpatient rehabilitation facilities. The median response for direct treatment duration was two to five sessions, reported by 41% ( $n = 108$ ) of the 263 respondents who reported providing inpatient dysphagia intervention. Treatment courses of six to ten sessions or more than 10 sessions were reported by only 8% ( $n = 22$ ) of the total inpatient clinician response pool, and were most common in inpatient rehabilitation settings.

### Outpatient Services

A total of 54% ( $n = 212$ ) of the survey respondents reported that they provided swallowing services to outpatients. These individuals came from a variety of different employment settings. For the purposes of the analyses, the outpatient services responses were divided according to the following employment setting categories: 1) facilities providing a continuum of care, either from acute care through rehabilitation, and/or from rehabilitation through long-term care (58%,  $n = 123$ ), 2) acute care facilities (26%,  $n = 54$ ), 3) inpatient rehabilitation centers (1%,  $n = 2$ ), 4) freestanding outpatient assessment clinics (1%,  $n = 2$ ), 5) outpatient rehabilitation centers (9%,

$n = 18$ ), long-term care or nursing home facilities (4%,  $n = 9$ ), 7) schools (1 respondent), and 8) private practices (1%,  $n = 3$ ).

### Outpatient clinical (“bedside”) swallowing assessments

As with the inpatient section of the survey, the outpatient section enquired about the provision of clinical (bedside) swallowing assessments (CBSAs). These were reported to be available in 92% ( $n = 195$ ) of the facilities offering outpatient services. CBSAs for outpatients were reported to be least available in acute care facilities (81%,  $n = 44$ ). Speech-language pathologists were reported to be the profession responsible for outpatient CBSAs in 87% ( $n = 170$ ) of the cases where CBSAs were offered. When the S-LP was not the responsible professional, this role was reported to most commonly be assumed by the occupational therapist (3% of the time,  $n = 6$ ), with clinical dietitians taking the lead in a few cases (1% of the time,  $n = 2$ ). Outpatient CBSAs were reported to be conducted solo by a single profession 55% of the time ( $n = 107$ ) and by a collaborating team 39% of the time ( $n = 76$ ). Occupational therapists and clinical dietitians were reported to participate in outpatient CBSAs 21% ( $n = 41$ ) and 23% ( $n = 45$ ) of the time, respectively.

### Outpatient instrumental swallowing assessments

Outpatient endoscopic swallowing examinations were reported to be offered by only 14 (6%) of the survey respondents who provided outpatient swallowing services. These individuals were employed exclusively in acute care or continuum facilities. In 6 of these 14 cases (42%), the S-LP reported that he or she was independently responsible for scope insertion. Endoscopy was reported to be performed collaboratively between the otolaryngologist and speech-language pathologist in four cases (29%) and in another four cases (29%) the model was not described. Single channel endoscopes were utilized in the majority of cases, with the dual channel option in use in only one reported case.

Outpatient VFSS examinations were reported to be available in 57% ( $n = 121$ ) of the 212 facilities providing outpatient swallowing services. Of these, schools (no cases, 0%) and long-term care facilities ( $n = 41$ , 33%) had the poorest availability of VFSS. In those facilities providing outpatient VFSS, the equipment was reported to be available in-house 82% ( $n = 99$ ) of the time, and clinicians indicated that they had privileges to attend and perform VFSS at another health care facility 13% of the time ( $n = 16$ ). In the remaining 5% of cases ( $n = 6$ ), outpatients were reported to be referred and sent to another facility for videofluoroscopy. Wait-times for outpatient VFSS are shown in Table 6.

The staffing complement for outpatient VFSS was reported to always include a radiologist or radiology resident 71% of the time ( $n = 86$ ); 12% ( $n = 15$ ) of the reported outpatient VFSS procedures were reported to be performed without a radiologist present. Speech-language

**Table 6**  
Wait-times for outpatient videofluoroscopy

	Frequency	Percent
1 working day or less	1	1
2-5 working days	10	7
1-2 weeks	26	19
2-4 weeks	36	27
More than 1 month	31	23
Not reported	30	22
Total	134	

pathologists and radiation technologists were reported to be present for outpatient VFSS 97% ( $n = 117$ ) and 82% ( $n = 99$ ) of the time, respectively. Other professions were reported to be predominantly present at outpatient VFSS on an occasional basis: occupational therapists (always present: 15%,  $n = 18$ ; sometimes present: 21%,  $n = 25$ ); clinical dietitians (always present: 5%,  $n = 6$ ; sometimes present: 23%,  $n = 28$ ); nursing staff (always present: 2%,  $n = 2$ ; sometimes present: 18%,  $n = 22$ ); attending physician (always present: 1%,  $n = 1$ ; sometimes present: 5%,  $n = 6$ ); respiratory therapists (always present: 7%,  $n = 8$ ; sometimes present: 25%,  $n = 30$ ); physiotherapists (always present: 6%,  $n = 7$ ).

### Outpatient interventions

Support for outpatient enteral feeding was reported to be available in slightly more than half of the facilities offering outpatient swallowing services (54%,  $n = 114$ ), with the lowest levels of support found in private practice settings (33%,  $n = 1$ ). Caregiver training and texture modification support were more available for outpatients overall (77%,  $n = 163$ ; and 75%,  $n = 159$ ). The poorest availability of these interventions was found in long-term care facilities (67%,  $n = 82$  for both caregiver training and texture modification support). Face-to-face direct therapy for outpatients with dysphagia was available in 67% ( $n = 142$ ) of the 212 facilities providing outpatient services. The lowest levels of availability were found in long-term care and inpatient rehabilitation facilities (44%,  $n = 54$ ; and 50%,  $n = 1$ , respectively). Where face-to-face direct therapy was offered, speech-language pathologists were reported to be the professionals most frequently responsible 98% of the time ( $n = 139$ ). Direct treatment was reported to be provided by a single profession 63% of the time ( $n = 89$ ). Involvement by other professions in face-to-face direct dysphagia therapy was reported as follows: occupational therapists (12% of the time,  $n = 17$ ); dietitians (26%,  $n = 37$ ) and nursing staff (2%,  $n = 3$ ). Text comments also mentioned occasional participation by clinical psychologists, physiotherapists and family members. The average number of direct face-to-face dysphagia therapy sessions provided to outpatients was reported to be un-fixed or unknown 25% of the time ( $n = 36$ ), and was most commonly reported to be between two and five sessions (31% of the time,  $n = 44$ ). Outpatient

treatment duration was reported to be limited to a single face-to-face session in 16% of cases ( $n = 23$ ) and courses of more than six sessions were reported only 13% of the time ( $n = 18$ ).

### Community-based/In-home Dysphagia Services

A total of 25% ( $n = 98$ ) of the survey respondents reported that their primary job involved traveling to provide in-home or community-based swallowing services. These individuals worked for a wide variety of employment settings, ranging from pure community based agencies (including private practices) to community services provided through an agency providing a full continuum of inpatient, outpatient, long-term care and educational services. For the purposes of the analyses, the community based services responses were divided according to the following employment setting categories: those based purely in the community (16%,  $n = 16$ ); those associated with an ambulatory care health facility (13%,  $n = 13$ ); and those associated with a residential health care facility (60%,  $n = 59$ ). The type of employment setting was not reported by 10 respondents (10%) who indicated that they provided community-based services. Analysis of the locations of the different types of employment settings offering community-based dysphagia services revealed that purely community-based and ambulatory-care associated services were more likely to be found in major urban centres, while services affiliated with residential health care facilities were more commonly found in smaller communities.

### Community-based clinical (“bedside”) swallowing assessments

As with the previous sections of the survey, questions were posed about the provision of clinical (bedside) swallowing assessments (CBSAs) to patients in the community. These were reported to be available in all except 2 (98%) of the facilities offering community-based dysphagia services. Speech-language pathologists were reported to be involved in community-based CBSAs 95% of the time ( $n = 91$ ). Occupational therapists were reported to participate in community-based CBSAs 40% of the time ( $n = 38$ ), with the lowest level of participation seen in community-based services affiliated with residential health care facilities (36%,  $n = 21$ ). Clinical dietitians were reported to participate in 28% ( $n = 27$ ) of the CBSAs occurring in the community; involvement by dietitians was not a characteristic of community-based CBSAs offered by agencies affiliated with ambulatory health care facilities. Participation by nursing staff in community-based CBSAs was reported 5% of the time ( $n = 5$ ). Collaboration across professionals as a team was the predominant, but not exclusive, model for community-based CBSAs (57% of the time,  $n = 55$ ).

### Community-based instrumental swallowing assessments

Thirty-five percent ( $n = 34$ ) of the 98 survey respondents working in the community told us that they were unable to access any form of instrumental swallowing

assessment for their patients. Of the 64 respondents who indicated that they were able to access instrumental procedures for community-based patients, 92% ( $n = 59$ ) indicated that they were able to access VFSS. By contrast, only 6% ( $n = 6$ ) of the community-based S-LPs reported having access to endoscopy, with this access restricted exclusively to community-based agencies affiliated with residential health care facilities. Speech-language pathologists working for community-based agencies were reported to have privileges to perform VFSS inside facilities with radiological equipment in 31% of reported cases ( $n = 18$ ). Wait-times for VFSS for community-based patients were most commonly reported as being 1-2 weeks (30%,  $n = 18$ ), 2-4 weeks (28%,  $n = 17$ ) or 1-2 months (25%,  $n = 15$ ). Waits of less than 1 week were reported in 9% of cases ( $n = 5$ ), and excessively long waits of greater than 3 months in duration were reported for the remaining 9% of cases ( $n = 5$ ).

### Community-based dysphagia interventions

Caregiver training (95%,  $n = 93$ ) and texture modification support (90%,  $n = 88$ ) were the most common forms of swallowing intervention provided in the community. Support for enteral feeding was reported to be available in 67% ( $n = 66$ ) of the community-based swallowing services. In-home, face-to-face direct therapy for dysphagia was reported to be available 79% of the time ( $n = 77$ ). The number of face-to-face treatment sessions was reported to be un-fixed in 30% of these cases ( $n = 23$ ), and most commonly ranged from 2-5 sessions (46%,  $n = 35$ ). Face-to-face treatment limited to a single session was reported to be the norm by 10% ( $n = 8$ ) of the community-based survey respondents providing treatment, and courses of more than 6 sessions in duration were reported to be available 13% of the time ( $n = 10$ ).

### Training, Procedural Knowledge and Continuing Education

#### University Training

Survey respondents were asked to optionally disclose the name of the university where they received their clinical speech-language pathology training, and the year of their graduation. A total of 84 respondents (21%) identified the university where they had trained, with two-thirds of these being schools located in Canada, and all except one of the remaining responses representing graduates of schools in the United States. Seven Canadian university training programs were represented: University of British Columbia, University of Alberta, University of Western Ontario, University of Toronto, Université d'Ottawa, McGill University and Dalhousie University. There were no responses disclosed as representing graduates of the Université de Montréal, or the more recently established program at Université Laval.

With respect to the number of years since graduating with a clinical degree in speech-language pathology, 94 respondents (24%) disclosed this information. Overall, these 94 survey respondents reported a mean duration of

14 years since graduation (range 1-37 years). This broke down further into 12% ( $n = 11$ ) with post-graduation experience of less than 2 years, 15% ( $n = 14$ ) with 3-5 years' experience, 18% ( $n = 17$ ) who had been practicing in the profession for between 6 and 10 years, 19% ( $n = 18$ ) with 10-15 years' experience and 36% ( $n = 34$ ) with more than 15 years of professional experience since graduation. Thus, based on these 94 respondents, this survey appears to reflect the responses of an experienced group of speech-language pathologists.

Respondents were also asked whether they had recent experience (in the past 2 years) in supervising students on clinical placements; this was reported to be the case by only 39 respondents (10%). Survey respondents were further asked to comment on their impressions of the adequacy of three aspects of student preparation in the area of dysphagia: theoretical knowledge, procedural knowledge, and clinical skills. These impressions were reported by a total of 94 survey respondents and are summarized in Table 7. In general, this table suggests that clinicians have the impression that students arrive on clinical placements involving dysphagia cases with inadequate preparation, particularly with respect to procedural knowledge and clinical skills.

**Table 7**

*Survey respondents' appraisal of the adequacy of student preparation in dysphagia*

	Theoretical Knowledge	Procedural Knowledge	Clinical Skills
Inadequate	28%	48%	53%
Adequate	64%	49%	45%
Very Good	9%	3%	2%

#### Procedural Knowledge

In order to understand the extent to which Canadian speech-language pathologists provide a variety of different swallowing assessment and treatment procedures, each survey respondent was asked to describe their frequency of using six specific assessment procedures and 19 specific intervention procedures. It should be noted that inclusion of these techniques in the survey does not imply endorsement of the technique by CASLPA, nor does it imply that evidence supporting the technique necessarily exists in the research literature. The procedures that were selected for inquiry included one assessment and seven intervention techniques that were expected to be familiar to the majority of survey respondents, based on the fact that they have been extensively described in the swallowing literature, including most textbooks: videofluoroscopy; postural compensations; the supraglottic and super-supraglottic swallows; the Mendelsohn manoeuvre; the

Masako (tongue-hold) manoeuvre; oral motor exercises; and thermal-tactile stimulation. FEES and suctioning (oral, pharyngeal and tracheal) were included as techniques that have been described in practice statements and clinical guideline documents as optional components of speech-language pathology practice, but were considered unlikely to be in wide use given the need for training, supervision or delegation by other medical professionals. Two assessment techniques (cervical auscultation and pulse oximetry) and several intervention techniques (lingual pressure generation exercises, the Shaker exercise, surface EMG biofeedback, neuromuscular electrical stimulation and Vital Stim) were considered likely to be familiar to survey respondents (but not in wide use) given that they are currently under investigation. Three intervention techniques from other domains that are claimed to have potential benefits for swallowing were expected to be unfamiliar to the majority of survey respondents (Facial Nerve Rehabilitation; Lee Silverman Voice Treatment; and Respiratory Resistance Training). Finally, three controversial techniques were included: deep pharyngeal neuromuscular stimulation, blue dye testing and glucose oxidase monitoring. Tables 8, 9a and 9b document the survey responses regarding utilization of these assessment and intervention techniques, respectively. In total, 318 respondents completed the assessment utilization questions and 311 respondents completed the intervention utilization questions on the survey. For each technique the mode responses regarding utilization are highlighted in bold font.

These tables confirm that videofluoroscopy is the predominant form of instrumental swallowing assessment in use in Canada. It is interesting to note that despite recent controversy regarding the safety of administering blue dye to detect aspiration in tracheotomized patients (Maloney & Metheny, 2002; Maloney et al., 2000; Maloney & Ryan, 2002; Metheny & Clouse, 1997; Metheny et al., 2002), this procedure is reported to be in current use by 37% ( $n = 118$ ) of the survey respondents.

Mode responses regarding the established intervention techniques showed that only postural compensations and oral motor exercises were reported to be in frequent use by the majority of survey respondents. Only 12% ( $n = 37$ ) of survey respondents reported frequent use of tracheal suctioning. Of the less established intervention techniques, the Shaker exercise, tongue-pressure generation exercise and surface EMG biofeedback were reported to be in the widest use (54%,  $n = 168$ ; 27%,  $n = 84$ ; and 17%,  $n = 53$ , respectively). At this time, treatment involving the administration of electrical current is in very limited use in Canada. In light of the current lack of empirical evidence guiding the use of electrical stimulation for dysphagia intervention (Ludlow et al., 2006; Steele, 2004; Steele, Thrasher, & Popovic, 2007; Suiter, Leder, & Ruark, 2006), this minimal reported utilization is considered to reflect appropriate caution on the part of clinicians regarding this new technology. Of the three cross-modality interventions, the Lee Silverman Voice Treatment (LSVT) was the most commonly utilized (31% of the time).

### Radiation protection awareness training

One topic of interest in this survey was to determine how much training in radiation protection awareness had been received by clinicians who perform videofluoroscopic swallowing assessments. This is of particular interest, given the report by survey respondents that radiologists are not present in the radiology suite during performance of the VFSS examination 9-12% of the time. A recent survey of members of the American Speech-Language Hearing Association's Special Interest Division 13 (Swallowing and Swallowing Disorders) suggested that 43% of responding clinicians performing videofluoroscopy had never received any education regarding radiation protection or awareness (Steele & Murray, 2004). It was of interest, therefore, to evaluate the level of radiation education received by Canadian clinicians. Of the 396 survey respondents, 249 reported involvement in either inpatient and/or outpatient videofluoroscopy at their primary workplace. The majority

of these individuals (80%,  $n = 199$ ) did not provide any information regarding their past radiation protection awareness training, and a further 9% ( $n = 22$ ) reported that they had never received any training regarding radiation protection. Formal radiation protection awareness training in the workplace, for one or more hours, was reported to have been received by only 3% ( $n = 7$ ) of the survey respondents involved in videofluoroscopy.

**Table 8**

*Reported utilization for six selected dysphagia assessment procedures.*

	VFSS	FEES	Cervical Auscultation	Pulse Oximetry	Blue Dye Test	Glucose Oxidase
Never heard of the procedure	0%	2%	8%	16%	4%	<b>50%</b>
Not used at my workplace	23%	<b>74%</b>	<b>36%</b>	<b>32%</b>	<b>45%</b>	41%
Available at work, but I do not use	2%	13%	22%	19%	14%	8%
Use infrequently	9%	7%	15%	23%	27%	1%
Use frequently	<b>65%</b>	4%	19%	11%	10%	0%

*Note.* Mode responses are shown in bold font.

**Table 9a.**

Reported utilization for 10 selected dysphagia intervention procedures.

	Established Compensatory Techniques					Established Rehabilitative Techniques		Suctioning		
	Postural Compensations	Supraglottic Swallow	Super-Supraglottic Swallow	Mendelsohn Maneuver	Makaso Maneuver	Oral Motor Exercises	Thermal Tactile Stimulation	Oral	Pharyngeal	Tracheal
Never heard of the procedure	1%	2%	3%	4%	22%	0%	3%	3%	5%	4%
Not used at my workplace	3%	9%	11%	10%	16%	2%	23%	21%	37%	30%
Available at work, but I do not use	3%	9%	13%	11%	16%	4%	26%	<b>43%</b>	<b>47%</b>	<b>53%</b>
Use infrequently	18%	<b>54%</b>	<b>54%</b>	<b>51%</b>	<b>29%</b>	32%	<b>40%</b>	22%	10%	9%
Use frequently	<b>75%</b>	25%	19%	25%	16%	<b>61%</b>	9%	12%	1%	3%

Note. Mode responses are shown in bold font.

**Table 9b.**

Reported utilization for nine additional selected dysphagia intervention procedures.

	Techniques Currently Under Investigation					Anecdotal Evidence	Cross-System Techniques		
	Lingual Pressure Generation Exercises	Shaker Exercise	sEMG Biofeedback	Neuromuscular Electrical Stimulation	Vital Stim	Deep Pharyngeal Neuromuscular Stimulation	Facial Nerve Rehabilitation	Lee Silverman Voice Treatment	Respiratory Resistance Training
Never heard of the procedure	28%	15%	7%	12%	40%	21%	23%	9%	<b>62%</b>
Not used at my workplace	<b>32%</b>	16%	<b>68%</b>	<b>81%</b>	<b>53%</b>	<b>71%</b>	<b>55%</b>	<b>34%</b>	31%
Available at work, but I do not use	13%	14%	8%	5%	4%	6%	10%	25%	5%
Use infrequently	22%	<b>40%</b>	13%	2%	3%	1%	9%	26%	2%
Use frequently	<b>5%</b>	14%	4%	0%	1%	1%	2%	5%	0%

Note. Mode responses are shown in bold font.

## Continuing Education

In addition to understanding clinicians' utilization of specific assessment and intervention procedures, the survey sought to learn about the kinds of continuing education that clinicians pursue with respect to dysphagia. A total of 97 respondents completed this section of the survey. The most common forms of continuing education reported were workshops, conferences or research symposia (97% of the time,  $n = 95$ ) and on-the-job training or mentorship with more experienced clinicians (90% of the time,  $n = 87$ ). Participation in a local or regional dysphagia interest group was reported by 43% of those who acquired post-graduate dysphagia-related continuing education ( $n = 42$ ), and participation in a journal club was reported by 22% ( $n = 21$ ). Additional university coursework had been completed by 12 survey respondents (12%). Continuing education in the area of dysphagia was expected to be something that might not be readily accessible to clinicians in all regions of the country. Respondents were asked to

identify perceived impediments to acquiring dysphagia-related continuing education. The most commonly perceived impediments were financial (17%,  $n = 69$ ), the lack of workshops being offered (10%,  $n = 39$ ) and the geographical accessibility of workshops (17%,  $n = 69$ ). A lack of available time to attend continuing education events was reported to be an impediment by 9% ( $n = 36$ ) of the survey respondents.

## CONCLUSION

This survey paints a comprehensive picture of dysphagia service delivery by Canadian S-LPs in 2006. It is clear that the demand for dysphagia services has grown over the past decade and that S-LPs play the leading role in meeting this demand in Canadian health-care settings. Formal swallowing screening procedures are commonly used to identify patients who require referral for swallowing assessment. Instrumental assessments, particularly videofluoroscopy, are in wide use by Canadian S-LPs.

Wait-times for these procedures can be lengthy, particularly for outpatients. Dysphagia intervention approaches predominantly involve diet texture modification and established compensatory techniques.

### References

- American Speech-Language-Hearing Association. (2004). *Preferred practice patterns for the profession of Speech-Language Pathology*. Retrieved June 26, 2007 from <http://www.asha.org/members/deskref-journals/deskref/default>.
- Canadian Association of Speech-Language Pathologists and Audiologists (1994). *Report of the Ad Hoc Committee on Dysphagia*. Ottawa, Ontario: Author.
- Canadian Association of Speech-Language Pathologists and Audiologists (1995). *Position paper on dysphagia*. Ottawa, Ontario: Author.
- Canadian Association of Speech-Language Pathologists and Audiologists. (2007). Position paper on dysphagia in adults. *Canadian Journal of Speech-Language Pathology and Audiology*, 31(3), 148-151.
- CIHI (2005). *Health Personnel Trends in Canada*. Retrieved June 26, 2007 from [http://secure.cihi.ca/cihiweb/products/2005\\_Provincial\\_Profiles\\_Full\\_Report\\_e.pdf](http://secure.cihi.ca/cihiweb/products/2005_Provincial_Profiles_Full_Report_e.pdf).
- Logemann, J. A. (1983). *Evaluation and treatment of swallowing disorders*. San Diego, CA: College Hill Press, Inc.
- Ludlow, C. L., Humbert, I., Saxon, K., Poletto, C., Sonies, B., & Crujido, L. (2006). Effects of surface electrical stimulation both at rest and during swallowing in chronic pharyngeal dysphagia. *Dysphagia* (Online first), 1-10.
- Maloney, J., & Metheny, N. (2002). Controversy in using blue dye in enteral tube feeding as a method of detecting pulmonary aspiration. *Critical Care Nurse*, 22(5), 84-85.
- Maloney, J. P., Halbower, A. C., Fouty, B. F., Fagan, K. A., Balasubramaniam, V., Pike, A. W., et al. (2000). Systemic absorption of food dye in patients with sepsis. *New England Journal of Medicine*, 343(14), 1047-1048.
- Maloney, J. P., & Ryan, T. A. (2002). Detection of aspiration in enterally fed patients: A requiem for bedside monitors of aspiration. *Journal of Parenteral & Enteral Nutrition*, 26(6 Suppl), S34-41.
- Martino, R., Pron, G., & Diamant, N. E. (2000). Screening for oropharyngeal dysphagia in stroke: Insufficient evidence for guidelines. *Dysphagia*, 15, 19-30.
- Metheny, N. A., & Clouse, R. E. (1997). Bedside methods for detecting aspiration in tube-fed patients. *Chest*, 111(3), 724-731.
- Metheny, N. A., Dahms, T. E., Stewart, B. J., Stone, K. S., Edwards, S. J., Defer, J. E., et al. (2002). Efficacy of dye-stained enteral formula in detecting pulmonary aspiration. *Chest*, 122(1), 276-281.
- Perry, L., & Love, C. P. (2001). Screening for dysphagia and aspiration in acute stroke: A systematic review. *Dysphagia*, 16(1), 7-18.
- Steele, C. M. (2004). Electrical stimulation of the pharyngeal swallow: Does the evidence support application in clinical practice? *Journal of Speech-Language Pathology and Audiology*, 28(2), 77-83.
- Steele, C. M., & Murray, J. (2004). Radiation awareness and practices among speech-language pathologists. *Perspectives, a peer-reviewed publication of the American Speech-Language Hearing Association Special Interest Division 13 (Swallowing and Swallowing Disorders)*, 13(3), 2-4.
- Steele, C. M., Thrasher, A. T., & Popovic, M. R. (2007). Electrical stimulation approaches to the restoration and rehabilitation of swallowing: A review. *Neurological Research*, 29(1), 9-15.
- Suiter, D., Leder, S. B., & Ruark, J. L. (2006). Effects of neuromuscular electrical stimulation on submental muscle activity. *Dysphagia*, 21(1), 56-60.

### Author Note

Funding and staff support for the work described in this manuscript was provided by the Canadian Association of Speech-Language Pathologists and Audiologists.

Correspondence regarding this article should be directed to: Catriona M. Steele, Toronto Rehabilitation Institute, 550 University Avenue, #12030, Toronto, ON M5G 2A2 E-mail: [steele.catriona@torontorehab.on.ca](mailto:steele.catriona@torontorehab.on.ca).

**Received: February 15, 2007**

**Accepted: August 13, 2007**

