

# TEMPLE UNIVERSITY HEALTH AND HOSPITAL SYSTEM

## BUSINESS CASE ANALYSIS

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### FINANCIAL OUTCOMES PROGRESS SUMMARY

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The introduction of an improved language services program at Temple University Hospital created an opportunity for direct financial benefits. A review of relevant literature suggested that improved patient-provider communication could affect a wide range of factors that resulted in revenue enhancements and expense reductions. We determined that the following might be observed in the emergency department and maternal services program; the areas in which the language service initiative was focused.

Revenue enhancements due to:

- Increased maternity volume (maternity/Infant Intensive Care Unit patients)
- Increased emergency patient volume
- More ED tests
- Better prenatal care (more prenatal tests)

Expense reduction due to:

- Shorter length of stay for patients admitted through the emergency department (better communication allows clinicians to more accurately and quickly diagnose patients and start treatment plan)
- Fewer ED tests for which there is no/under reimbursement
- Fewer repeat admissions caused by poor communication leading to low patient adherence

Based on a series of discussions, Temple financial analysts constructed a Return on Investment (ROI) model for language services (Table 1)

The fiscal staff recommended that we choose our fiscal 2004 year (7/03-6/04) as the baseline year and our fiscal 2005 year (7/04-6/05) as the intervention year, since the full time medical interpreter staff were initially deployed close to the beginning of fiscal year 2005.

The results of this analysis were as follows:

#### **1. Latino Maternity Growth vs. Other Maternity Growth at TUH**

Surprisingly, maternity volume from Spanish-speaking patients actually declined 8% at TUH during the year a full time medical interpreter was assigned there. Non-Spanish speaking maternity volume increased 6% during the same period. At first glance, this would suggest a negative affect. Of course, multiple factors can affect admission rates of any patient group. In addition, we experienced a 13% decline in Spanish-speaking patient admissions to all non-maternity inpatient services. Since maternity is the only inpatient service in which we introduced professional interpreters during fiscal year 2005, the possibility exists that better language services reduced the maternity decline over what would otherwise have occurred.

Of course, multiple factors can affect admission rates of any patient group. Our assessment is that a comparison of one intervention year against one baseline year is too short a time to measure market share changes in maternity services. The length of time required for a more patient-friendly environment to become widely known could easily extend beyond one year. We plan to continue this analysis over the next two years, during which we may observe clearer trending patterns.

# Health Care for Limited English Proficient Populations Hablamos Juntos Lessons Learned September 30, 2005

**Table 1 – Return on Investment Model**

Hablamos Juntos  
DRAFT Financial Model  
July 8, 2004

Item Measured	Populations Measured for Comparative Purpose	Period Measured	Impact Model
1 Maternity/Newborn Latino Volume at TUH Main	a. Maternity Latino (Hispanic) % Change b. Maternity All Other Ethnicity % Change c. Non-Maternity Latino Elective % Change (TUH Main) d. Non-Maternity All Other Ethnicity Elective % Change (TUH Main)	Targeted FY to Baseline FY2004	If a>b <b>AND</b> c>d, impact is the % represented by a less c. If a>b <b>AND</b> c<d, impact is the % represented by a less b.
2 Latino ED Admission Volume at TUH Main	a. ED Latino (Hispanic) Admissions % Change (TUH Main) b. ED All Other Ethnicity Admissions % Change (TUH Main) c. Latino Elective Admissions % Change (TUH Main) d. All Other Ethnicity Elective Admissions % Change (TUH Main)	Targeted FY to Baseline FY2004	If a>b <b>AND</b> c>d, impact is the % represented by a less c. If a>b <b>AND</b> c<d, impact is the % represented by a less b.
3 Latino ED Admission Volume at EH	a. ED Latino (Hispanic) Admissions % Change (EH, non transfers) b. ED All Other Ethnicity Admissions % Change (EH, non transfers) c. Latino Elective Admissions % Change (TUH Main) d. All Other Ethnicity Elective Admissions % Change (TUH Main)	Targeted FY to Baseline FY2004	If a>b <b>AND</b> c>d, impact is the % represented by a less c. If a>b <b>AND</b> c<d, impact is the % represented by a less b.
4 Latino ED Admission LOS at TUH Main	a. ED Latino (Hispanic) admission - standardized ALOS (TUH Main) b. ED Latino (Hispanic) risk adjusted admission - ALOS (TUH Main) c. ED Latino (Hispanic) admission - standardized ALOS (TUH Main) d. ED Latino (Hispanic) admission - risk adjusted ALOS (TUH Main)	Baseline FY 2004 Baseline FY 2004 Target FY Target FY	If c-d (target year variance) is greater than a-b (baseline year variance), then impact is the difference between the 2 variances.
5 Latino ED Admission LOS at EH	a. ED Latino (Hispanic) admission - standardized ALOS (EH) b. ED Latino (Hispanic) admission - risk adjusted ALOS (EH) a. ED Latino (Hispanic) admission - standardized ALOS (EH) b. ED Latino (Hispanic) admission - risk adjusted ALOS (EH)	Baseline FY 2004 Baseline FY 2004 Target FY Target FY	If c-d (target year variance) is greater than a-b (baseline year variance), then impact is the difference between the 2 variances.
<b>Non Financial Measure in Model</b>			
1 Frequent Flyer Latino Patients:ED Visits	a. ED Latino patients vs visit Ratio	Targeted FY to Baseline FY2004	Measure any decrease in Ratio from target year to calendar year.
2 Risk Management Claims	Monitor any incidences due to communication issues	Target Year	

## 2. Latino Emergency Department (ED) Admissions Growth vs. Other ED Admissions Growth

Spanish-speaking ED volume increased 86% during fiscal year 2005, the intervention year. This growth was more dramatic than the 45% increase in non-Spanish-speaking ED patients during the same period. One possibility for this result is that the improved language friendliness of the ED, with its medical interpreter staff, increased preference for Temple. However, this is by no means conclusive, since various factors could also explain our observation. We looked at non-ED admissions to see whether there was merely an overall increase in Spanish-speaking patients due to the expanding size of this population. Non ED admissions of Spanish-speaking patients actually declined 38% during the same period while non-Ed admissions of non-Spanish speaking patients declined a smaller 19%. So the possibility exists that preference of Spanish-speaking patients for the Temple ED increased due to language service improvement. Again, a multi-year horizon would be useful to this analysis. In addition, we are contemplating focus groups to assess whether there has been a general preference increase among the Spanish-speaking community for the Temple ED.

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### 3. Frequent Flyers

Better patient communication has been linked to better understanding of and adherence to physician treatment recommendations. We felt therefore, that we might observe a lower number of patient visits for repeat issues such as acute asthma episodes after we deployed medical interpreters in the ED. Our comparison of the control and intervention years resulted in an inconclusively small change in ED visits per patient (1.49 versus 1.47).

Two factors need to be considered in this analysis. First, due to interpreter coverage being limited to 40 hours each week, a majority of ED patients did not have access to interpreters even in the intervention year. In addition, the intervention year was the start up of our Hablamos Juntos language service initiative and was characterized by significant underutilization by clinicians who were just learning to adopt this new resource. Thus, a majority of the intervention group was not given the interpreter services. Second, various initiatives are undertaken to improve quality and reduce unnecessary length-of-stay and so other influences could complicate the analysis.

TUHS is contemplating a follow up study during which the control and intervention groups would be defined by reviewing patient records to establish which patients received language services and which did not. This more pure characterization would provide a more accurate analysis. Ultimately, we hope to expand the analysis to compare face-to-face interpreter services to telephone-based services.

### 4. Emergency Admission Length of Stay

Having medical interpreters in the ED better equips clinicians to assess patients and, if admitted, provides the inpatient team with more complete information with which to quickly implement the treatment plan. Thus, the average-length-of-stay (ALOS) of Spanish-speaking patients admitted from the ED could be somewhat less for those served by medical interpreters. Even a .2 day ALOS reduction would result in a \$100,000 contribution margin increase to TUHS, since our reimbursement system is predominantly case-based versus per diem.

Our analysis showed a comparable risk-adjusted ALOS for Spanish-speaking patients in FY04 (during which there were very limited language services) and FY05 (during which there were Hablamos Juntos interpreters) for Temple University Hospital's main campus ED. An inconclusively small improvement in ALOS occurred at the TUH Episcopal Campus ED during FY05.

As in number three, TUHS is contemplating a follow up study to more accurately compare patients who received language services to those who did not, to make the analysis more precise.

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Temple University Hospital  
 Hablamos Juntos Program  
 Review of Financial Impact/ Pilot Data

**1. Latino Maternity Growth vs. Other Maternity Growth at TUH Main**

		FY 2004	FY 2005	Variance	% Change
MATERNITY	SPANISH SPEAKING	792	725	(67)	-8%
MATERNITY	OTHER	2,731	2,889	158	6%
		3,523	3,614	91	3%
OTHER	SPANISH SPEAKING	1,768	1,547	(221)	-13%
OTHER	OTHER	19,683	20,428	745	4%
		21,451	21,975	524	2%
Total	SPANISH SPEAKING	2,560	2,272	(288)	-11%
Total	OTHER	22,414	23,317	903	4%
		24,974	25,589	615	2%

Spanish-Speaking Maternity volume declined at TUH, while Other Maternity volume experienced growth. A similar trend was observed amongst Non-Maternity volume; however, the decline in volume for non-maternity Spanish speaking patients was greater than the decline in maternity Spanish speaking patients. Overall, it appears that the overall TUH population is experiencing modest growth but the Spanish-speaking population is declining. The impact is reduced in the maternity program, which may be attributed to the limited number of maternity programs in the area. Given the decline in the Spanish-speaking maternity population, but a less significant decline than the non-maternity Spanish-speaking population, a financial impact is inconclusive with the currently evaluated data.

**2. Latino ED Admission Growth vs. Other ED Admission Growth at TUH & EH**

		FY 2004	FY 2005	Variance	% Change
EMERGENCY	SPANISH SPEAKING	989	1,840	851	86%
EMERGENCY	OTHER	9,728	14,114	4,386	45%
		10,717	15,954	5,237	49%
ELECTIVE	SPANISH SPEAKING	2,390	1,474	(916)	-38%
ELECTIVE	OTHER	19,233	15,666	(3,567)	-19%
		21,623	17,140	(4,483)	-21%
Total	SPANISH SPEAKING	3,379	3,314	(65)	-2%
Total	OTHER	28,961	29,780	819	3%
		32,340	33,094	754	2%

Overall, emergency volume has grown, with the Spanish Speaking population growing faster than the non-Spanish speaking population. The elective volume has however declined, but with the Spanish speaking population declining faster than the non-Spanish speaking population. TUH has experienced an overall shift from elective activity to emergent activity, which is consistent with the overall market trend. In total, the Spanish-speaking population has declined (65 cases) with an overall swing from elective to emergent activity. The decline in total Spanish speaking patients renders inconclusive findings at this time.

**3. Frequent Flyers**

	2004	2005	Variance	% Change
Spanish Speaking Outpatient Emergency Visits	8,329	10,361		
Spanish Speaking Emergency - Unique Patients	5,583	7,066		
Outpatient ER Visits per Spanish Speaking Patient	1.49	1.47	0.02	-1.3%

The ratio of visits to the ER per unique patient was measured for Spanish-speaking patients. A significant change has not been experienced over the baseline period.

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Temple University Hospital  
 Hablamos Juntos Program  
 Review - Length of Stay

**1. Latino Emergency Length of Stay at TUH Main**

	FY 2004	FY 2005	Variance
Spanish Speaking			
Geometric Length of Stay	2.90	3.10	
GM LOS Adjusted for Select Practice	2.50	2.70	
Variance	(0.40)	(0.40)	-

Amongst Spanish-Speaking Emergency patients at TUH, the variance between the risk adjusted geometric length of stay (GMLOS) compared to the targeted Risk Adjusted Select Practice GMLOS remained unchanged from FY2004 to FY 2005. There is no impact on risk adjusted GMLOS.

**2. Latino Emergency Length of Stay at EH Campus - Med/Surgery Activity**

	FY 2004	FY 2005	Variance
Spanish Speaking			
Geometric Length of Stay	1.70	1.50	
GM LOS Adjusted for Select Practice	1.70	1.60	
Variance	-	0.10	0.10

Amongst Spanish-Speaking Emergency med/surgery patients at EH, the variance between the risk adjusted GMLOS compared to the targeted Risk Adjusted Select Practice GMLOS improved by 0.10 from FY2004 to FY2005, where the GMLOS is actually better than target.

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