The Relationship between the CU Students' Ability to Identify Stress Patterns of English Polysyllabic Medical Terms and the Ability to Pronounce Them

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Abstract

Word stress, especially for terminologies like medical terms, has been of great concern among EFL instructors for many years, and EFL students find it difficult to get the correct pronunciation due to the polysyllabic nature of most medical terms. This study has three main objectives: to explore the CU medical students' problems in marking stress in English polysyllabic medical terms; to find out the relationship between the students' ability to identify stress patterns of English polysyllabic medical terms and the ability to pronounce them; and to investigate students' opinions on the word-stress marking in English polysyllabic medical terms. The participants included 30 CU first-year medical students in semester two of the academic year 2007. The students were asked to pronounce the medical terms and then to identify stress patterns of the terms in the word list. Moreover, they were asked to complete the questionnaires. The data from the tape recording, from the word list and from the questionnaires were statistically analyzed.

Introduction

1. Background and Statement of Problems

A number of professions worldwide use English as a medium for communication. Therefore, English plays an important role in many countries, including Thailand. The medical field is a case in point. Medical students and physicians, though they learn their course subjects in Thai, use English medical terms throughout their studies and work life. They encounter many problems when using these medical terms. One of their major ones is when they pronounce these terms, word stress is usually ignored, since word stress patterns in Thai are fixed while English is a free-stress language (Luksaneeyanawin, 1983; Vairojanavong, 1984) and they naturally assume that if they enunciate each syllable clearly, they will be understood (Clarey and Dixson, 1963: 11). Vairojanavong (1984)'s findings support Lado (1957)'s Contrastive Analysis Hypothesis that the errors made in L2 learning could be attributed to 'interference' by the L1; the elements which are similar to the learner's native language will be easy for him/her, and the elements that are different will be difficult. Word stress is a case in point. In many languages, particularly in English, it is noted that some parts of an utterance are more prominent than others. This prominence is achieved by contrasts in stress and pitch (Bowen: 1978: 1). Rogerson and Gilbert (1990: 17) note that the importance of English word stress patterns is often underestimated by students who study English as a second or foreign language. Actually, incorrect stress placement often poses a serious problem for learners (Brown, 1992: 111; Roach, 1983 cited in Rogerson and Gilbert, 1990: 17); there will be a serious disturbance of communication if the rhythmic patterns are incorrect because, for the identification of word forms, the English listener relies largely on his/her perception of familiar accentual prominences (Guierre, 1970). Some evidence from research supports Guierre's statement that native speakers store vocabulary according to word stress patterns. When the wrong pattern is heard, the listener may spend time searching for stored words in the wrong category (Rogerson and Gilbert, 1990: 17), thereby obstructing understanding and communication. This may have serious consequences in the context of the medical profession.

For this reason, research into English word stress patterns in the medical context is needed.

2.   Research Questions

This research aims to answer the following questions:

2.1   Do CU medical students have problems in marking stress in English polysyllabic medical terms?

2.2   Is there a relationship between the students' ability to identify stress patterns of English polysyllabic medical terms and the ability to pronounce them?

2.3   What are the medical students' opinions on the word-stress marking in English polysyllabic medical terms?

3.   Research objectives

The research objectives of this study are:

3.1   To explore the CU medical students' problems in marking stress in English polysyllabic medical terms

3.2   To find out the relationship between the students' ability to identify stress patterns of English polysyllabic medical terms and the ability to pronounce them

3.3   To investigate students' opinions on the word-stress marking in English polysyllabic medical terms

4.   Definition of Terms

4.1   **English polysyllabic medical terms** refer to medical terminology in English which contains more than one syllable. These terms are composed of Greek and/or Latin roots.

4.2   **CU medical students** refer to first year medical students at Chulalongkorn University, taking the course "English for Medical Profession 2" in semester two of the academic year 2008.

4.3 **Word stress** is concerned with stress placement of individual words of two or more syllables when they are pronounced in isolation (Wijk, 1966).

5. Research Methodology

This is an exploratory research study. The purposes of the study are to explore the CU medical students' problems in marking stress of English polysyllabic medical terms selected from unit 1 of the course book "English for Medical Profession 2", to find out the relationship between the students' ability to mark stress patterns of English polysyllabic medical terms and the ability to pronounce them, and to investigate the students' opinions on word-stress marking in English polysyllabic medical terms.

5.1   Population and Sampling

The population of the preliminary study was first year medical students at Chulalongkorn University in academic year 2007. The participants of the study were an intact group, comprising 30 medical students (in class Section 7) of the course "English for Medical Profession 2" in semester two of the academic year 2007.

5.2   Research Instruments

There are two main research instruments in the preliminary study: a list of English polysyllabic medical terms and a questionnaire.

5.2.1 A list of English polysyllabic medical terms (Appendix A) consisted of 35 words. There were 5 disyllable medical terms. The others were terms that contained 3, 4 and more than 4 syllables. There were 10 terms for each category. These terms were randomly selected from unit 1 of the course book "English for Medical Profession 2". The unit concerns understanding medical terms. The objectives of this unit are to enable students to identify the meaning of roots, prefixes and suffixes as used in medical terminology and to use appropriate medical terms in context. All in all, there were about 60 medical terms in this unit. In the list, the 35 selected terms were randomly mixed and presented in 3 columns.

5.2.2 A questionnaire (Appendix B) was designed to gather information on students' demographic characteristics and their opinions toward word stress patterns in English polysyllabic medical terms. The questionnaire consisted of two parts. The first part dealt with personal information, which was gender, grades in previous English courses (i.e. Experiential English 1 and English for Medical Profession 1) they took in the first semester at the university. The other part concerned information regarding students' opinions on word stress patterns in English polysyllabic medical terms. This part of the questionnaire was composed of seven 4-point-Likert-scale questions.

5.3 Research Procedure

Data Collection

Each student was asked to pronounce the 35 English polysyllabic medical terms presented in the word list (Appendix A). The pronunciation of the participants was tape-recorded. After pronouncing each word, each student was asked to mark the stress in the same medical terms in the word list and then complete the questionnaire (Appendix B).

Later, the researcher listened to the tape-recording and then marked stress in the medical terms on the list which corresponded to each student's pronunciation.

Data Analysis

The researcher checked the correct stress patterns from an online medical dictionary (http://medical-dictionary.thefreedictionary.com/) and two medical dictionaries: Medical Sciences Dictionary (Thiengburanathum, 2005) and Webster's New World™ Medical Dictionary 2nd Edition (Doctors at MedicineNet.com, 2003) and by consulting a native speaker. Then, the students' word stress patterns, which both the researcher and the other rater derived from listening to the tape recording and from the actual marking of the students, were checked against the mentioned dictionaries and the native speaker's enunciation for correctness. The inter-rater reliability, obtained from using the Pearson product-moment correlation coefficient (Bachman, 2004: 85), was 1.0 at the

significance level of 0.01. Later, the stress-marking patterns in each term were categorized and analyzed according to the word-stress positions. The data were analyzed using frequency and percentage.

6.   Research Findings

The students' responses from the word list are presented in four categories: the response from speaking, the response from writing, the relationship between the response from speaking and that from writing, and the response from the questionnaires. For the first and the second categories, the medical terms were rearranged according to the number of syllables and presented, together with the response and percentage, in the tables.

6.1   The response from speaking

Table 1:   The Response from Speaking of 2-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
2-Syllable Words	**lac**tose	23 (76.7%)	7 (23.3%)
	thrombus	23 (76.7%)	7 (23.3%)
	lipoid	19 (63.3%)	11 (36.7%)
	neuron	26 (86.7%)	4 (13.3%)
	toxin	27 (90%)	3 (10%)
	$\bar{X}$	**78.68%**	**21.32%**

Note: N = 30

Most students can pronounce the word *neuron* correctly. The second range is *lactose* and *thrombus*. The word *lipoid* is the 2-syllable medical terms that the students can least pronounce correctly.

Table 2: The Response from Speaking of 3-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
3-Syllable Words	in**som**nia	25 (83.3%)	5 (16.7%)
	a**ne**mia	15 (50.0%)	15 (50.0%)
	in**er**tia	23 (76.7%)	7 (23.3%)
	car**di**tis	6 (20.0%)	24 (80.0%)
	lipocyte	10 (33.3%)	20 (66.7%)
	ma**lig**nant	19 (63.3%)	11 (36.7%)
	neu**ro**ma	17 (56.7%)	13 (43.3%)
	dys**le**xia	13 (43.3%)	17 (56.7%)
	pathogen	4 (13.3%)	26 (86.7%)
	gynecoid	14 (46.7%)	16 (53.3%)
	X̄	**48.67%**	**51.33%**

Note: N = 30

According to table 2, *insomnia* is the word that the students can most pronounce correctly while *carditis* and *pathogen* are the 3-syllable medical terms that the students can least pronounce correctly.

Table 3: The Response from Speaking of 4-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
4-Syllable Words	leuco**pe**nia	17 (56.7.0%)	13 (43.3%)
	hydro**pho**bia	23 (76.7%)	7 (23.3%)
	my**o**logy	9 (30.0%)	21 (70.0%)
	hypo**ther**mia	17 (56.7%)	13 (43.3%)
	thermo**ple**gia	5 (16.7.0%)	25 (83.3%)
	ne**phro**lysis	8 (26.7%)	22 (73.3%)
	derma**ti**tis	8 (26.7%)	22 (73.3%)
	ano**rex**ia	22 (73.3%)	8 (26.7%)
	cy**to**lysis	10 (33.3%)	20 (66.7%)
	opthal**mi**tis	6 (20.0%)	24 (80.0%)
	X̄	**35.34%**	**64.66%**

Note: N = 30

From table 3, most students (76.7%) can correctly pronounce *hydrophobia*. On the contrary, most students (83.3%) mispronounce the word *thermoplegia*.

Table 4: The Response from Speaking of More-Than-4-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
More-Than-4-Syllable Words	immu**no**logy	16 (53.3%)	14 (46.7%)
	megalo**car**dia	12 (40.0%)	18 (60.0%)
	thrombo**ge**nesis	8 (26.7%)	22 (73.3%)
	carci**no**lysis	9 (30.0%)	21 (70.0%)
	hepato**rrhe**xis	14 (46.7%)	16 (53.3%)
	hypergly**ce**mia	12 (40.0%)	18 (60.0%)
	osteopo**ro**sis	4 (13.3%)	26 (86.7%)
	hepatho**me**galy	0 (0.0%)	30 (100.0%)
	gastroente**ri**tis	6 (20.0%)	24 (80.0%)
	asterioscle**ro**sis	9 (30.0%)	21 (70.0%)
	X̄	25.33%	74.67%

Note: N = 30

Among ten more-than-4-syllable medical terms, most students (53.3%) can correctly pronounce *immunology*. However, no one can correctly pronounce *hypothomegaly*.

6.2 The response from writing

Table 5: The Response from Writing of 2-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
2-Syllable Words	**lac**tose	19 (63.3%)	11 (36.7%)
	thrombus	25 (83.3%)	5 (16.7%)
	lipoid	23 (76.7%)	7 (23.3%)
	neuron	27 (90.0%)	3 (10.0%)
	toxin	29 (96.7%)	1 (3.3%)
	X̄	82.68%	17.32%

Note: N = 30

From table 5, most students (96.7%) can correctly mark stress on *toxin*. However, *lactose* is the word that the students can least mark the correct stress.

Table 6: The Response from Writing of 3-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
3-Syllable Words	in**som**nia	28 (93.3%)	2 (6.7%)
	a**ne**mia	15 (50.0%)	15 (50.0%)
	in**er**tia	24 (80.0%)	6 (20.0%)
	car**di**tis	8 (26.7%)	22 (73.3%)
	lipocyte	13 (43.3%)	17 (56.7%)
	ma**lig**nant	20 (66.7%)	10 (33.3%)
	neu**ro**ma	18 (60.0%)	12 (40.0%)
	dys**lex**ia	20 (66.7%)	10 (33.3%)
	pathogen	13 (43.3%)	17 (56.7%)
	gynecoid	11 (36.7%)	19 (63.3%)
	$\overline{X}$	**50.34%**	**49.66%**

Note: N = 30

Most students (93.3%) can put correct stress marking on the word *insomnia* while 73.3% of them can't put correct stress marking on *carditis*.

Table 7: The Response from Writing of 4-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
4-Syllable Words	leuco**pe**nia	21 (70.0%)	9 (30.0%)
	hydro**pho**bia	23 (76.7%)	7 (23.3%)
	my**o**logy	11 (36.7%)	19 (63.3%)
	hypo**ther**mia	20 (66.7%)	10 (33.3%)
	thermo**ple**gia	6 (20.0%)	24 (80.0%)
	ne**phro**lysis	10 (33.3%)	20 (67.7%)
	derma**ti**tis	8 (26.7%)	22 (73.3%)
	ano**rex**ia	20 (66.7%)	10 (3.3%)
	cy**to**lysis	14 (46.7%)	16 (53.3%)
	opthal**mi**tis	7 (23.3%)	23 (76.7%)
	$\overline{X}$	**37.33%**	**62.77%**

Note: N = 30

Most students can most correctly mark stress pattern on *hydrophobia* while they can least correctly mark stress pattern on *thermoplegia*.

Table 8: The Response from Writing of More-Than-4-Syllable Words

	Words	Correct Word-Stress Marking	Incorrect Word-Stress Marking
More-Than-4-Syllable Words	immu**no**logy	17 (56.7%)	13 (43.3%)
	megalo**car**dia	11 (36.7%)	19 (63.3%)
	thrombo**ge**nesis	7 (23.3%)	23 (76.7%)
	carci**no**lysis	10 (33.3%)	20 (66.7%)
	hepato**rrhe**xis	12 (40.0%)	18 (60.0%)
	hypergly**ce**mia	12 (40.0%)	18 (60.0%)
	osteopo**ro**sis	7 (23.3%)	23 (76.7%)
	hepatho**me**galy	6 (20.0%)	24 (80.0%)
	gastroente**ri**tis	6 (20.0%)	24 (80.0%)
	asterioscle**ro**sis	6 (20.0%)	24 (80.0%)
	X̄	**30.67%**	**69.33%**

Note: N = 30

17 out of 30 (86.7%) can correctly mark stress on *immunology* whereas 24 out of 30 (80.0%) cannot correctly mark stress on *hepathomegaly, gastroenteritis* and *asteriosclerosis*.

6.3 The relationship between the response from speaking and that from writing

The students' response from their pronouncing of the medical terms and that from their marking stress patterns was calculated using the Pearson product-moment correlation coefficient (Bachman, 2004: 85) to find out their correlation. The result is shown in the following table

Table 9: The Correlation between the Response from Speaking and That from Writing

Words	x^2	Phi
1. lactose	.002	.562
2. thrombus	.001	.599
3. lipoid	.002	.562
4. neuron	.283	.196
5. toxin	.002	.557
6. insomnia	.190	.239
7. anemia	.011	.467
8. inertia	.000	.709
9. carditis	.680	.075
10. lipocyte	.193	.238
11. malignant	.000	.636
12. neuroma	.000	.659
13. dyslexia	.009	.476
14. pathogen	.060	-.343
15. gynecoid	.003	.536

Words	x^2	Phi
16. leucopenia	.091	.308
17. hydrophobia	.001	.627
18. myology	.026	.408
19. hypothermia	.004	.523
20. thermoplegia	.000	.671
21. nephrolysis	.041	.373
22. dermatitis	.000	.659
23. anorexia	.000	.693
24. cytolysis	.605	-.094
25. opthalmitis	.005	.512
26. immunology	.000	.665
27. megalocardia	.216	.226
28. thrombogenesis	.002	.558
29. carcinolysis	.011	.463
30. hepatorrhexis	.011	.464
31. hyperglycemia	.000	.722
32. osteoporosis	.009	.479
33. hypathomegaly	.[a]	.[a]
34. gastroenteritis	.001	.583
35. asteriosclerosis	.028	.400

[a] No statistics are computed because the figure is constant.

Using the two-variable Chi-Square, the data obtained from the students' stress identification and pronunciation have been computed by the SPSS program. The results have been presented in table 9. It is obvious that 7 out of 35 medical terms from the list (neuron, insomnia, carditis, lipocyte, pathogen, leucopenia, cytolysis, and megalocardia) do not show significant correlation between the students' ability to identify the stress pattern and their ability to pronounce them.

Moreover, the data have been calculated to gain the correlation value. At the significance level of .01, Pearson correlation of the students' ability to identify stress pattern of English polysyllabic medical terms and the ability to pronounce them is .676. This shows that the ability of the students to identify stress pattern of English medical polysyllabic medical terms correlates with their ability to pronounce them.

6.4   The response from the questionnaires

The data from the questionnaires asking the students about their opinions on the word stress patterns in English polysyllabic medical terms were analyzed to derive means using frequency and percentage.

Table 10: The Response from the Questionnaires

Items	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	$\overline{X}$
1. You think that word stress patterns in English medical terms are important for the medical profession.			22 (73.3%)	8 (26.7%)	3.27
2. You have adequate knowledge about word stress patterns in English polysyllabic medical terms.	17 (56.7%)	11 (36.7%)	1 (3.3%)	1 (3.3%)	1.53
3. You can pronounce English polysyllabic medical terms with correct word stress patterns.	13 (43.3%)	-	17 (56.7%)	-	2.13
4. Incorrectly stressed medical terms have negative effects on the medical profession.	1 (3.3%)	-	15 (50.0%)	14 (46.7%)	3.40
5. The more syllables in an English medical term make pronunciation more difficult.	1 (3.3%)	12 (40.0%)	17 (56.7%)	-	2.53
6. Correct stressing of English polysyllabic medical terms is not important for being a doctor.	10 (33.3%)	18 (60%)	2 (6.7%)	-	1.73
7. Word stress patterns in medical terms have an effect on communication among doctors.	2 (6.7%)	5 (16.7%)	17 (56.7%)	6 (20.0%)	2.90

Note: N = 30

From the questionnaires, the mean scores of the questions were taken into consideration. First, all of the students agreed that word stress patterns in English medical terms are important for the medical profession. Second, most of them (93.4%) disagreed that they had adequate knowledge about word stress patterns for English polysyllabic medical terms. Third, 56.7 % claimed that they could pronounce English polysyllabic medical terms with correct word stress patterns. Fourth, almost all of them agreed that incorrectly stressed medical terms have negative effects on the medical profession. Next, 56.7% agreed that more syllables in an English medical term make pronunciation more difficult. Moreover, most of them (93.3%) did not agree that correct stressing of English polysyllabic medical terms is unimportant for being a doctor. Finally, 76.7% agreed that word stress patterns in medical terms have an effect on communication among doctors.

7. Discussions and Implications

From the research findings, the discussions and implications are to be presented based on the three research questions as follows.

Concerning the first research question, marking stress in English polysyllabic medical terms is problematic among the medical students. It is evident that the more syllables a medical term has, the more difficult it will be to pronounce. In an EAP course, like English for medical profession, there are a number of medical terms; some are familiar by the students, but some are not. In speaking, the students may face many difficulties. Apart from the difficulty caused by personal factors (e.g. shyness), the students may face difficulties in speaking which are caused by linguistic factors (e.g. pronunciation, stress, intonation, or overall rhythm) (Jordan, 1977: 205). What is needed in EAP courses is a kind of individualized scheme for speech improvement which involves the two main areas of difficulty: word pronunciation and word stress. In technical and semi-technical vocabulary, it seems primary stress placement is a frequent source of difficulty (Hewings: 1988). Hewings (1993) suggests this can be achieved partly by working independently in a language laboratory. To solve this problem, Hewings introduces two strategies. The first one is called *peer group*

teaching. It involves students reading from a selected text which they record in a language laboratory. On a copy of the texts, the major errors are circled by the tutor, but the nature of errors is not indicated. In groups, students listen to the appropriate recordings, look at the circled text, and identify the nature of the errors. A student who can correct the error then shows the others how to produce the correct version. Hewings found this strategy can highly motivate students. The other strategy, *exchange scheme*, is more individualized in that the teacher provides each student a circled text of the errors in his/her recordings and then records a model version for the students to listen to. Hewings says this method is effective, but it is time-consuming, especially in the early stages.

As suggested by Hewings, pronunciation drills in both peer groups and individual tutoring can be applied in medical students in order to practice pronouncing medical terms correctly. Alternatively, a student may practice imitating the teacher or the instruction on the CD, and then his/her ability to use proper stress patterns when speaking English will improve (Dale & Poms, 2005: 84). A lot of practice is needed by starting from words and then connected speech (Fitzpatrick, 1995: 34-35). Although there are no exact rules for determining which syllable of a word should be stressed, some observations may help the students (Jotikasthira, 1999: 30-39). Otherwise, the students may apply the pronunciation pattern of the Thai language to pronounce the English polysyllabic medical terms, since they do not know where to place the stress (Maccarthy 1965: 2). Additionally, the teacher must be a good model for the students. To say, he/she must correctly pronounce the medical terms so that the students can hear the correct pronunciation and stress pattern (Vairojanavong, 1984: 150). Then, they will automatically acquire the pronunciation pattern of those words.

Second, when comparing the mean scores from tables 1-4 with those from table 5-8, the mean scores of incorrect word stress marking in each category from speaking seemed to be slightly higher than those from writing. This can be caused by personal factors like shyness and anxiety (Jordan, 1977: 205). Nevertheless, the Pearson correlation showed that the medical students' ability to identify stress patterns of English polysyllabic medical terms

correlated with their ability to pronounce the same terms. This shows that there is a relationship between the competence and performance of the students. The findings can be applied for the teacher when evaluating the students' ability of word stress placement. For instance, in a class of a number of students, instead of listening to students' pronunciation, the teacher can design a test and ask the students to identify the stress patterns by marking stress on the syllable of a word. In this way, the test can be reliable, valid and practical. As a result, the results from the test can be claimed to demonstrate the students' ability to correctly pronounce a word.

Third, the findings from the questionnaires have shown that the medical students realized the importance of word stress patterns in English medical terms and that can have negative effects on their profession and communication. Most of them said they did not have enough knowledge about English word stress patterns, but they could pronounce English polysyllabic medical terms with correct word stress patterns. Based on the mean scores from tables 1-8, it can be seen that the students could not place the correct stress patterns on those polysyllabic medical terms, both in speaking and writing. This result contradicts the students' perception that they thought they could perform well. Further, more than half agreed that more syllables in a medical term makes pronunciation more difficult. This result accords with the findings from tables 1-8, the more syllable a medical term has, the higher potential students make mistake to mark stress. As a result, it is evident that the medical students have realized the importance of word stress pattern and that they do have problems with word stress pattern. Therefore, they have a strong motivation to learn and practice (Brown, 2001).

In conclusion, it is clear that stress is crucially important in English and can never be ignored or overlooked if an acceptable mastery of spoken English is a learning goal. Accordingly, in an EAP class, the teacher should put an emphasis on English word stress patterns, and not give it less attention than other features and skills of English. Finally, students should pay more attention to this feature and try their best to place correct stress on English polysyllabic words.

8. Recommendations for further Studies

Based on the results and findings from the study, the following are a number of areas that could be investigated in future studies:

First of all, this study can be extended with larger groups of participants who could also assist in confirming the relationship between the students' ability to identify stress patterns of English polysyllabic medical terms and their ability to pronounce them, as well as their opinions on the issue.

Second, this study should be replicated with different groups of participants such as students in the faculty of Veterinary Science, the faculty of Dentistry, the faculty of Allied Health Sciences, etc. This could provide distinctive insights to this field of study. Moreover, the results from the students in different faculties should be carried out to gain different perspectives for comparison.

Lastly, the same study could be repeated, but the medical terms used in the study should be changed. For example, the researcher may use medical terms derived from medical textbooks or journals that students are often exposed to. In addition, the errors of the stress pattern placement of English polysyllabic medical terms should be analyzed.

9. Significance and Usefulness of Research

The results of the study are likely to make students and teachers aware of the problems of word stress patterns when pronouncing English polysyllabic medical terms. In addition, it will help teachers to determine the best way to teach the word stress patterns in English polysyllabic medical terms. The study will also help students, especially medical students, to give greater importance to English word stress patterns.

10. Acknowledgements

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APPENDIX A

Word List (for pronunciation)

Directions: Pronounce the following words.

คำสั่ง: จงออกเสียงคำต่อไปนี้

1. insomnia	13. carditis	25. lipoid
2. osteoporosis	14. hydrophobia	26. dermatitis
3. lactose	15. lipocyte	27. gastroenteritis
4. immunology	16. myology	28. neuron
5. anemia	17. hypothermia	29. hyperglycemia
6. megalocardia	18. malignant	30. toxin
7. inertia	19. thermoplegia	31. anorexia
8. thrombogenesis	20. thrombus	32. pathogen
9. carcinolysis	21. hepatomegaly	33. gynecoid
10. leucopenia	22. neuroma	34. cytolysis
11. asteriosclerosis	23. dyslexia	35. opthalmitis
12. hepatorrhexis	24. nephrolysis	

APPENDIX B

The Questionnaire for Eliciting Medical Students' Opinions on the Word Stress Patterns in English Polysyllabic Medical Terms

PART 1

Directions: Answer all of the following questions by marking X in the box.

1. Sex

    □ Male   □ Female

2. Your grade of the course "Experiential English 1"

    □ A   □ B+   □ B   □ C+   □ C

    □ D+   □ D   □ F

3. Your grade in the course "English for Medical Profession 1"

    □ A   □ B+   □ B   □ C+   □ C

    □ D+   □ D   □ F

PART 2

Directions: Answer all of the following questions based on your opinions by marking X in the box

Statements	Totally disagree 1	Disagree 2	Agree 3	Totally agree 4
1. You think that word stress patterns in English medical terms are important for the medical profession. นิสิตคิดว่าการเน้นพยางค์เสียง (stress) ของคำศัพท์ทางการแพทย์เป็นเรื่องสำคัญต่อวิชาชีพแพทย์				

Statements	Totally disagree 1	Disagree 2	Agree 3	Totally agree 4
2. You have adequate knowledge about word stress patterns in English polysyllabic medical terms. นิสิตคิดว่าตนเองมีความรู้ในการการเน้นพยางค์เสียงของคำศัพท์ทางการแพทย์เป็นอย่างดี				
3. You can pronounce English polysyllabic medical terms with correct word stress patterns. นิสิตสามารถออกเสียงเน้นพยางค์ของคำศัพท์ทางการแพทย์ได้อย่างถูกต้อง				
4. Incorrectly stressed medical terms have negative effects on the medical profession. การเน้นพยางค์เสียงของคำศัพท์ทางการแพทย์**ไม่ถูกต้อง**ก่อให้เกิดผลเสียต่อวิชาชีพ				
5. The more syllables in an English medical term make pronunciation more difficult. คำศัพท์ทางการแพทย์ที่มีหลายพยางค์ทำให้การเน้นพยางค์เสียงยากขึ้น				
6. Correct stressing of English polysyllabic medical terms is not important for being a doctor. การเป็นแพทย์ไม่จำเป็นต้องสนใจการเน้นพยางค์เสียงของคำศัพท์ทางการแพทย์				
7. Word stress patterns in medical terms have an effect on communication among doctors. การเน้นพยางค์เสียงของคำศัพท์ทางการแพทย์มีผลต่อการสื่อสารระหว่างแพทย์				