

# Scientific Posters

The elements

1

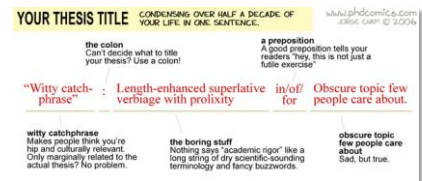
## Elements

- Title
- Author(s) + affiliation
- Abstract/Introduction/Background
- Method(s)
- Data/results
- Conclusion(s)
- References
- Acknowledgements

2

## Element: title

- Must be very interesting
  - conveys of what your poster is about
  - if acceptable for the conference/ audience make the title catchy to get people's attention (provocative...)
  - Audience must be tempted from a distance
- Visible and readable at 5 m
- Concise
  - If too long, make it shorter, reformulate
  - Do not decrease the font size
  - Avoid the use of ':'



## Element: title

- Idea: the title should be the simple answer to the main issue that your poster addresses

[www.lisabmarshall.com/uncategorized/sample-scientific-posters/](http://www.lisabmarshall.com/uncategorized/sample-scientific-posters/)

- Compare:

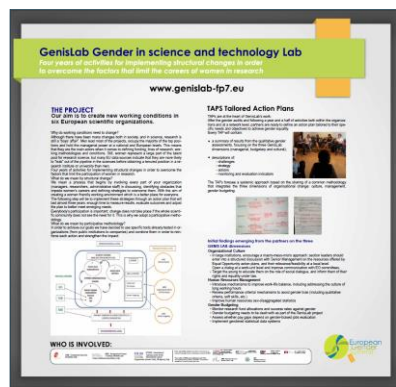


- "A Study of Automobile Emissions Generated at Drive Up Windows"
- "5% of Air Pollution Derives from Cars Idling at Drive Up Windows"
- "5% of Air Pollution from Idling at Drive Up Windows"
- "Drivers Spend an Average of 7.2 Minutes Idling at Drive Up Windows"
- "Drive Up Windows pollute and frustrate"

## Element: title

- Put it on top
  - Another spot might be interesting
  - With people walking around, the lower part might be obscured
- Do not use uppercase only
  - Shouting
  - Harder to read

## Element: title



[www.epostersonline.com/egs2012/?q=poster/egs2012036009b](http://www.epostersonline.com/egs2012/?q=poster/egs2012036009b)



<http://www.epostersonline.com/egs2012/?q=poster/egs20120070019>

- Write the first name in full
  - Initials and titles are not needed
  - A photo of the person who is presenting the poster, or highlight / underline the name
  - Check with advisor on the list of the collaborators
    - Who is to credit?
- Do not forget the affiliation



## Element: abstract

- If it is not required, DON'T.
- Most of the times your abstract will be printed in the conference catalog.
- If you do include an abstract in your poster try to make it very short. It should be a very brief summary of the poster

## Element: introduction

- Engage your audience – give some background
  - Essential points / positioning the research
  - Explains why this work is important
  - Minimum of background information and definitions.
  - Provide a description and justification of your experimental method(s)
  - Include your hypothesis.
- Must be a help to the structure of the poster
- Summary 150 – 200 words
- *Complete Clear Concise Cohesive*

## Expression, purification, and crystallization of recombinant mouse phospholipase c-zeta (PLC-ζ)

Pang, Allan  
BSc Genetics | School of Biosciences, Cardiff University, Cardiff, Wales CF10 3US

**ABSTRACT**  
The aim of this study is to express and purify recombinant PLC-ζ protein for X-ray diffraction through X-ray crystallography. To date, there is no available structural data of PLC-ζ. The identification of the protein structure is essential for understanding the mechanism of the protein function and the interaction of the protein with other molecules. This study aims to express and purify PLC-ζ protein and to determine its structure by X-ray crystallography. The study also aims to determine the effect of the protein on the function of the cell membrane.

**INTRODUCTION**  
Phospholipase C (PLC) is a member of the phospholipase family, which is involved in the signal transduction pathway. PLC is a key enzyme in the signal transduction pathway, which is involved in the regulation of the cell membrane. PLC is a key enzyme in the signal transduction pathway, which is involved in the regulation of the cell membrane.

**EXPERIMENTAL RESULTS**  
Figure 1: Molecular cloning of PLC-ζ cDNA. The cDNA was cloned into the pET28a vector and expressed in E. coli. The protein was purified by ion exchange chromatography and size exclusion chromatography. The protein was then crystallized and the crystals were used for X-ray diffraction.

**CONCLUSION**  
The study has successfully expressed and purified PLC-ζ protein and determined its structure by X-ray crystallography. The structure of PLC-ζ is a dimeric protein with a molecular weight of 100 kDa. The structure is a dimeric protein with a molecular weight of 100 kDa.

**ACKNOWLEDGEMENTS**  
I would like to thank Dr. A. Davies for his support and advice during the project. I would also like to thank the staff of the School of Biosciences for their help and support.

## Socio-environmental Dimensions of Safety of Mexican Seasonal Farmworkers in Saskatchewan: Opportunities for Learning Sustainability

Arcadio Vivero-Guerra  
PhD Student, School of Environment and Sustainability (SES), Saskatoon, SK S0N 0A0, Canada

**ABSTRACT**  
Many regions, migrant farmworkers experience difficult working conditions that have negative implications for sustainable development. To solve domestic farm labour shortages in Canada, the Canada-Mexico Seasonal Agricultural Workers Program (SMWP) was established in 1974. Canada is increasingly dependent on offshores workers, their changing importance requires greater awareness. It was expected that the program was explicitly aware in national and international policy and research.

**INTRODUCTION**  
In Canada, systematic training of English as a second language is insufficient or nonexistent for farmworkers. In Canada, systematic safety and health training is still insufficient or nonexistent for farmworkers. In Saskatchewan, the SMWP has not been characterized in terms of its socio-environmental context, and to understand the role of farmworkers' agricultural safety and health, and training needs with respect to agricultural sustainability.

**CONCLUSION**  
The study has successfully identified the socio-environmental context of the SMWP and the role of farmworkers' agricultural safety and health, and training needs with respect to agricultural sustainability.

www.flickr.com/photos/xerophytes/2397163232/sizes/o/in/pool-688685@N24/

chrs-scrrs.usask.ca/images/2011awards/2011-Student-1-Arcadio.jpg

# Element: data/results – text

- Keep it short, simple and clear
- Remove all non-essential information
- Avoid footnotes
- Avoid abbreviations, acronyms, jargon, ...
- Use no more than 1000 words
- Use charts as visual eye-candy
- Rule-of-thumb:
  - 20% text
  - 40% graphics
  - 40% space
- Format might be domain dependent

## Element: data/results – text

The ideal anesthetic should quickly make the patient unconscious but allow a quick return to consciousness, have few side effects, and be safe to handle.

## Ideal anesthetics

- Quick sedation
- Quick recovery
- Few side effects
- Safe to handle


## Element: data/results - text

- Too much text
- Boring

- Better, still some room for improvement

[illegible]






Queen's University Belfast

## Using students' personal stories for learning

N Catherwood, J Goodfellow, P Ross,  
Dr M Corrigan, Dr J Johnston, Mrs C Thomson, Dr K McGlade.



The Higher Education Academy

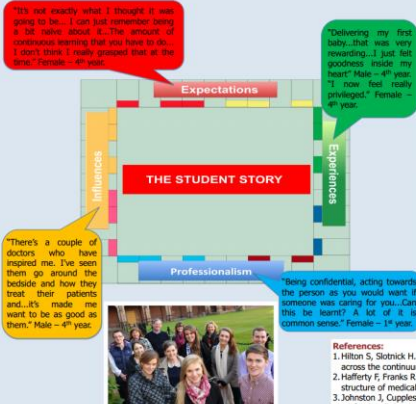
**Background**

- The **development of cynicism** and a decline in attitudes towards professionalism among medical students as they progress through their training has been linked to the hidden curriculum.<sup>1,2,3</sup>
- Narrative techniques** are being increasingly employed to help understand complex social interactions.
- This project is interested in how **professional identity** is formed and whether the phenomenon of the **loss of idealism** observed during training, could be addressed with **learning resources** derived from student peer to peer video interviews.

**Methods**

- 11 first (n=6) and fourth (n=5) year **students interviewed 42 of their peers** on camera.
- Student researchers kept **reflective diaries** and "field notes".
- Transcription** of interviews.
- Themes** from interviews were identified.
- Website** structures brainstormed.

**Acknowledgments:**  
All 42 first and fourth year student participants.  
Queen's University Belfast Information Services.



**Expectations:** "It's not exactly what I thought it was going to be... I can still remember being a bit naive about it... The amount of continuous learning that you have to do... I don't think I really grasped that at the time." Female - 4th year

**Experiences:** "Delivering my first baby that was very rewarding... I just felt goodness inside my heart" Male - 4th year  
"I now feel really privileged." Female - 4th year

**Influences:** "There's a couple of doctors who have inspired me. I've seen them go around the bedside and how they treat their patients and... it's made me want to be as good as them." Male - 4th year

**Professionalism:** "Being confident, acting towards the person as you would want if someone was caring for you... Can this be learnt? A lot of it is common sense." Female - 1st year

**Results**

- The **game board** presentation incorporates important elements relevant to medical students' development; an on-going **pathway**, elements of **change and external influences** and opportunities.
- Those **themes** deemed most relevant or important as identified in the interviews will feature significantly in the **website**. Emergent themes included students' **expectations**, their **influences**, their **personal experiences** and ideas of **professionalism** in medical school.

**Conclusions**


- Discrepancies between expectations and experiences** may be contributing to the emergence of cynicism.
- The loss of idealism may be **minimised through using personal stories** to prepare students for the realities of studying medicine whilst also developing a professional identity.
- Stories collected will form a **web based learning resource**.

**References:**  
1. Hilton S, Sturnick H. (2005). Proto-professionalism: how professionalisation occurs across the continuum of medical education. *Medical Education* 39:58-65.  
2. Hafferty F, Franks R. (1994). The hidden curriculum, ethics teaching, and the structure of medical education. *Academic Medicine* 69:861-871.  
3. Johnston J, Cupples M, McGlade K, Steele K. (2011). Medical Students' attitudes to professionalism an opportunity for the GP Tutor. *Education in Primary Care* 22: 321-7.

<http://www.epostersonline.com/asme2013/?q=node/42&posterview=true>

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## City of Lit- Iowa City UNESCO City of Literature Mobile Application Research & Development

**BIOGRAPHIES**  
Life stories of local authors emphasize links to Iowa City

Students access primary research documents in local archives including the Iowa Writers Collection and Iowa Short Stories at the University of Iowa Special Collections

Students enter their research into a custom web interface

City of Lit spotlights the people and places of Iowa City's rich literary history through an interdisciplinary, civically-engaged collaboration:

Undergraduate students conduct primary research on local authors

An interdisciplinary team of researchers - computer and library and information scientists, artists, writers and literary scholars - review the information for the mobile application

Users view, interact with, and contribute to the collection via the mobile application

App available for download on Apple mobile devices

Search "Iowa City of Lit" on iTunes for iPhone, iPod, and iPad versions

**MULTIMEDIA**  
Audio and video features stream local readings, lectures, and interviews; photography and graphics capture authors and texts

Users sit in an conversation with authors, students, researchers, and even the authors themselves

Users to authors need be their own literature. In a future release, users will be able to contribute personal text and audio commentary by clicking on a link in the app

**LITERATURE**  
Annotated resources both by and about the author connect key texts to the Iowa City community

Each day, a new 30-second audio clip featuring an author is presented on the app's opening screen. The annotated short stories are available on the app's homepage, categorized by author, and the app's homepage

All app descriptions provide general author information, biographies, and locations of the literature, biographies, and locations of the literature, biographies, and locations of the literature

**MAPS**  
Annotated maps use text, images, and GPS function to tour key places for each author in Iowa City

At each location on the virtual tour images and text describe the author's career, place in Iowa City

Currently, updated features of the app include news reports on Iowa City and the literary world and a news section about the app's progress, local authors, and authors. Information is dynamically updated from the university's official literary website



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## Element: data/results - charts

- Table:
  - Limited number of data
  - Label columns
- Charts:
  - Large set of data points
  - Do not forget to label plots, axes, ...
- Charts must be readable at a distance of 2 m!
- Get all the charts in a uniform way, size

**clinical**  **Teaching Human Factors to Medical Students- A Simulation Based Course** Hull and East Yorkshire Hospitals   
Sega Pathmanathan, Faiza Chowdhury, Jivendra Gosai, Rebekah Molyneux, Makani Purva

**Introduction**  
The role of human factors in medical error has been well recognized with 60% of all errors being attributed to human factors particularly problems in communication<sup>1</sup>. A preliminary survey of medical students undergoing an optional placement at our simulation centre suggested that they had no or limited knowledge regarding the role of human factors in error. We designed a simulation based half a day course addressing the role of human factors in error and evaluated how effective it was in achieving its objectives.


**Methods**  
We recruited 6 candidates, who were medical students. Prior to the course each candidate was given a questionnaire to assess their confidence in leadership skills, communication, knowledge of human factors and ability to prioritise both non-clinical and clinical tasks. The course commenced with an overview on Human factors. A practical session on SBAR was provided. The third session was a 15 minute scenario- the candidate is covering a ward of four patients and has a task to do for one of those patients. However as the scenario progresses the candidate is given a number of distractions of varying complexity, which they must prioritise and attend to. The distractions vary from calls from other wards to other urgent tasks on other wards. The candidate is debriefed on the session with the other candidates also giving feedback. The scenario was then re-run after the debrief session with another candidate. Following the course, a post course questionnaire with similar questions as the pre-course was administered to evaluate the effectiveness of the course. Feedback was also obtained.

**Results**

Confidence in	Mean Pre Course	Mean Post Course	P Value
Knowledge of Human factors contributing to error?	2.33(1.03)	3.83(0.75)	0.02*
Ability to communicate clinical details	3(0)	3.67(1.03)	0.14
Leadership skills?	2.33(0.82)	3.5(0.84)	0.03*
Prioritising clinical tasks in an acute situation?	1.83(0.75)	3.17(1.17)	0.04*
Prioritising non-clinical tasks in an acute situation?	2(0.63)	3.5(1.22)	0.04*
Recognizing when to call for senior input?	3.5(0.55)	4.33(0.82)	0.07

**Feedback**

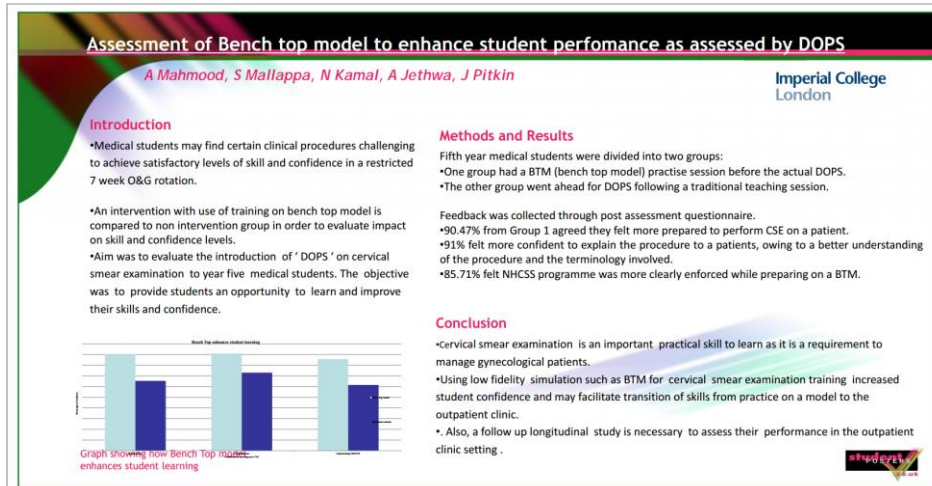
Feedback Question	Mean Score
Human Factors: An overview	4.67
SBAR Communication session	4.67
Simulation encounter	5
De Briefing Session	5
Facilitator Feedback	4.67



**Discussion**  
The increases seen in confidence levels demonstrate the impact of the course in learning about Human factors. We believe that by developing this, we can fill the gap in Human factors awareness. The Yorkshire and Humber Deanery Foundation School has recently included this in their curriculum delivery<sup>2</sup> and we plan to extend this course to all year one foundation doctors in our region.

**References**  
1) Rogers, Jm, Glavac, Kusan et al. Analysis of surgical errors in closed malpractice claims at 4 tertiary hospitals. Surgery 2006; 140: 25-33.  
2) Yorkshire and Humber Deanery Foundation School Clinical skills and Simulation Strategy. <http://www.yorkhumbfoundationschool.org.uk/healthprofessionsdocuments/yorkhumbfoundationschoolclinicalskillsandsimulationstrategy.pdf>

<http://www.epostersonline.com/asme2013/?q=node/83&posterview=true>



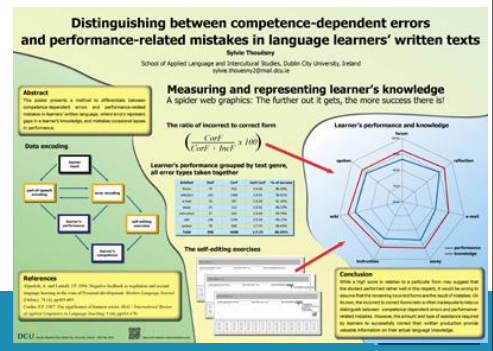
<http://www.epostersonline.com/asme2013/?q=node/76&posterview=true>

## Element: visual elements

- Select what to visualize.
- Sketch it yourself.
  - Convert your sketches into digital.
  - Search online for images, based on your sketches.

## Element: conclusion

- Important part of the poster
  - Tie your conclusion back to your hypothesis and results.
  - Discuss why your findings are meaningful and relevant.
  - Include the future directions of your research.
  - Emphasize the important/strong points
- Use bullets to distinguish the different elements



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## Element: acknowledgements / references

- **Acknowledgements**
  - Funding,
  - Who was helping you out with your research
- **References**
  - Only the important – no literature study
  - Can be expanded during conversation

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# Element: acknowledgements / references



V53B-2838  
AGU 2012

## Comparison of Volcanic Gas Compositions obtained using a Portable Sensor Package and Evacuated Flasks from Cascade Range Volcanoes (USA)

Peter Kelly<sup>1</sup>, Cynthia Werner<sup>2</sup>, Bill Evans<sup>3</sup>, Steve Ingebritsen<sup>3</sup>, Dave Tucker<sup>4</sup>

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<sup>2</sup> Alaska Volcano Observatory, U.S. Geological Survey, 4210 University Drive, Anchorage, AK 99508, USA

<sup>3</sup> U.S. Geological Survey, Menlo Park, CA, USA  
<sup>4</sup> Western Washington University, Bellingham, WA, USA

contact: pkelly@usgs.gov

### 1. Introduction

Devolving from most Cascade Range volcanoes, USA, is characterized by low-temperature hydrothermal emissions. It is important to monitor these emissions as part of a comprehensive monitoring strategy yet access is often difficult and most features are sampled by the TSCS only once per year at best using a titanium tube and evacuated glass flask (direct sampling). In an effort to increase the sampling frequency of major gas species and to maintain the building permanent, autonomous gas monitoring units, we built a portable MultiGAS sensor package (Multi-component Gas Analyzer System, e.g. Shimadzu, 2005; Apera, 2005) capable of measuring H<sub>2</sub>O, CO<sub>2</sub>, SO<sub>2</sub>, and H<sub>2</sub> in volcanic gas plumes. In recent years MultiGAS-type instruments have been used to monitor volcanic gas monitoring tools for both campaign-style and long-term deployment (e.g. Apera et al., 2007). The MultiGAS and direct samples we collected at the same time from active hydrothermal features at Mt. Baker, WA, and Mt. Hood, OR (Fig. 1), plus data from direct samples collected in prior years. Evacuated flasks were analyzed at the USGS Volcano Gas Geochemistry Laboratory in Menlo Park, CA.

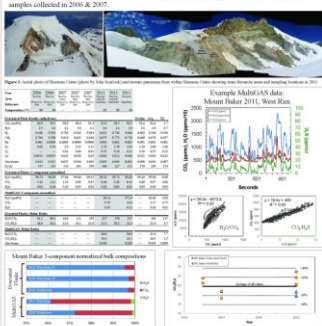
### 2. Instrumentation

The MultiGAS unit we built is similar to the instrument described by Apera et al. (2007). The main features include:

- Measurement of H<sub>2</sub>O, CO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>, pressure, temperature
- H<sub>2</sub>O, CO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub> (0.1 to 100 ppm), CO<sub>2</sub> (0.1 to 1000 ppm)
- H<sub>2</sub> (0.1 to 100 ppm), CO<sub>2</sub> (0.1 to 100 ppm)
- Self-contained, rugged, 1 kg, with 12V battery
- Constructed entirely from commercially available equipment
- Self-contained, rugged, 1 kg, with 12V battery
- Log data at 1 Hz to onboard datalogger and to notebook computer
- Optional network computer interface (H<sub>2</sub>O, CO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>, and H<sub>2</sub>SO<sub>4</sub> mixing ratios, the four-component bulk plume composition, and gas ratios (H<sub>2</sub>O/CO<sub>2</sub>, CO<sub>2</sub>/SO<sub>2</sub>, and CO<sub>2</sub>/H<sub>2</sub>)

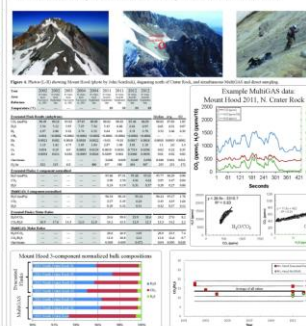
### 3. Mount Baker, WA (3286 m)

We collected simultaneous MultiGAS and direct samples from the West Rim (Steeley group) and Northwest area of Shumner Cone (~2000 m) in 2011. Shumner Cone is a site of vigorous degassing located ~1 km south of the summit of Mt. Baker. We present these data plus additional data from direct samples collected in 2008 & 2007.



### 4. Mount Hood, OR (3429 m)

In 2011 and 2012 we collected simultaneous MultiGAS and direct samples from an area located on the western margin of Crater Rock that is about 0.5 km south of the summit and at ~3100 m elevation. In addition to these data, we present results from direct samples collected between 2002 - 2009.



### 5. Discussion Points

- No SO<sub>2</sub> detected at Mount Baker or Mount Hood
- Mount Baker: Results from evacuated flasks and MultiGAS data collected at the same time show significant differences. CO<sub>2</sub>/SO<sub>2</sub> ratios differ by 20-50%, gas/steam ratios differ by an order of magnitude
- Mount Hood: The two methods show very good agreement, most parameter agree within 20% or less
- For both Mount Baker and Mount Hood, MultiGAS CO<sub>2</sub>/SO<sub>2</sub> ratios are within ~20% of average values

### 6. Thanks!

- For MultiGAS hardware: Shimadzu, Apera, and Apera
- For help with Mount Baker fieldwork: Steve Ingebritsen, Dave Tucker, and Cynthia Werner
- For help with Mount Hood fieldwork: Steve Ingebritsen, Dave Tucker, and Cynthia Werner
- For help with Mount Hood fieldwork: Steve Ingebritsen, Dave Tucker, and Cynthia Werner

### 7. References

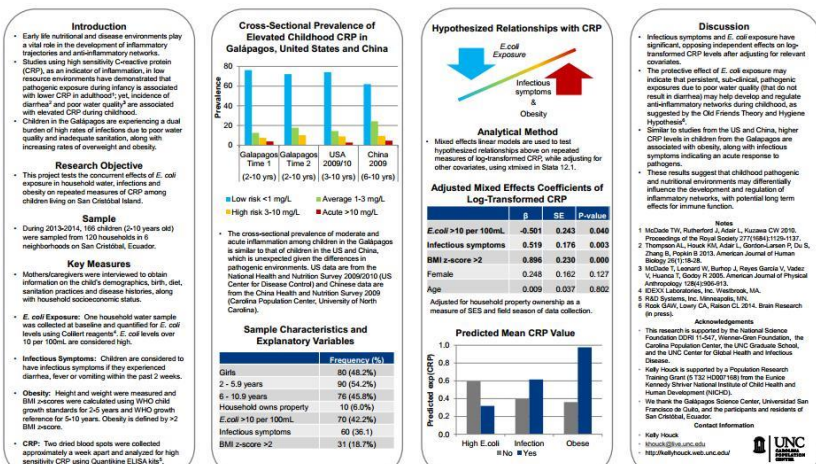
- 1. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 2. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 3. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 4. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 5. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 6. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 7. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 8. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 9. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.
- 10. Apera, J., et al., 2007. MultiGAS: A portable, autonomous, multi-component gas analyzer for volcanic gas monitoring. *Journal of Volcanology*, 116, 1-10.

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# Element: acknowledgements / references

## Effects of Early Life Pathogenic Exposures and Obesity on Childhood Inflammation Levels in Galápagos, Ecuador


Kelly M Houck<sup>a,b</sup>, Amanda L Thompson<sup>a,b</sup>, Mark V Sorensen<sup>a</sup>, <sup>a</sup>University of North Carolina, Chapel Hill, <sup>b</sup>Carolina Population Center



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# Element: contact information

- Include contact info:
  - E-mail
  - Phone



## The Impact of Lee Silverman Voice Treatment (LSVT) on Voice Handicap & Communication Effectiveness

David S. Ford, M.S.<sup>1,2</sup>; Andrew Palmer, M.S.<sup>1</sup>; Linda Bryans, M.A.<sup>1</sup>; Joshua Schindler, M.D.<sup>1</sup>; Donna J. Graville, Ph.D.<sup>1</sup>

<sup>1</sup>Northwest Clinic for Voice & Swallowing Disorders, Dept. of Otolaryngology-Head & Neck Surgery, Oregon Health & Sciences University, Portland, OR

<sup>2</sup>Strata & McQuinn, Inc., Sewickley, PA

### Research Questions

- What is the impact of LSVT on functional communication as rated by individuals with PD and their partners?
- Are there differences in the efficacy of LSVT as measured by self-ratings of voice handicap and communication effectiveness?

### Introduction

Individuals with Parkinson Disease (PD) often present with one or all of the communication symptoms that are characteristic within the domain of hypokinetic dyspraxia. In essence, the motor system involved in producing voice and speech becomes hypofunctional (Sills, 2002). Patients may experience hypophonia and hypoarticulation of the vocal folds, resulting in reduced loudness and/or voice quality, breathiness, or harsh vocal quality. They may also demonstrate imprecise articulation, reduced prosody, dysfluency/pauses, and misperceptions/misconceptions (PM) causing hypernasality (Saps, Rangi, & Fox, 2011).

Lee Silverman Voice Treatment (LSVT) is reported as the most well-established, efficacious treatment for communication deficits secondary to Parkinson Disease (Holman, Hesse, Swankman, & Page, 2007). Although numerous studies have been published reporting acoustic and perceptual outcomes (Burgemeister, Saps, & Rangi, 2005; Rangi, Courtman, Cohen, Hesse, & Thompson, 1998; Rangi et al., 2001; Rangi, Saps, Fox, & Courtman, 2001; Saps, Silverman, Rangi, Saps, & Fox, 2007), there is compelling evidence suggesting functional outcomes (Karlinsky et al., 1997; Saps et al., 2002; Saps, Rangi, Hesse, & Fox, 2007). In addition, generalizing these findings is difficult as some of these data were collected with anecdotal measures, small numbers of subjects, and anomalies in heterogeneous groups. According to one systematic review (Burgemeister et al., 2007), more evidence of treatment efficacy is needed, particularly with regard to the impact of treatment on "the subjective of communication-related ratings" (2007). Thus, the current study was undertaken to investigate the functional impact of LSVT on communication, to identify which aspects of communication are most impacted by treatment, and whether LSVT effects are generalized to communication and voice handicap equally.

### Methods

A retrospective chart review was conducted of all patients with PD who had undergone LSVT at the Northwest Clinic for Voice & Swallowing Disorders from 2009 to 2012. Inclusionary criteria included a diagnosis of idiopathic PD, no head or neck surgery, no other speech or voice changes, no confounding medical conditions affecting voice or speech, no confounding language disorders, no other speech therapy, and having undergone only one course of LSVT, and completion of the full 16-session treatment course of LSVT.

**Demographic Data:** Age, gender, Parkinson Disease severity (Unified Parkinson Disease Rating Scale (UPDRS) score prior to LSVT), and time post-onset of PD (years).

### Pre-Post Treatment Measures

- Acoustic vocal analysis including measures of intensity, timing, pitch, and duration (time sustained) phonation, phoneme, reading aloud, and conversational speech, and measures of flow and intonation.
- Communication Effectiveness Survey (CES) or 8-item patient-reported outcome measure of communicative effectiveness that has been shown to be valid for use with individuals with PD (Conson, Valdez, & Ropstein, 2007). This instrument was provided to both the patient and their primary communication partner (if a spouse).
- The Voice Handicap Index (VHI) is a 30 item, self-administered questionnaire that assesses the patient's perception of their voice disorder on physical, functional, and emotional aspects of daily life (Johnson et al., 1997).

### Data Analysis

The Wilcoxon Signed Samples Sign Test was used to compare the CES and VHI pre and post-treatment. The Sign Test was used to identify whether individual items of the CES had changed significantly from pre- to post-treatment.

### Results

**Background Characteristics:** A total of 12 participants (9 males, 4 females) met the inclusion criteria. Their mean age was 58.23 years ( $SD = 8.71$ ) and mean time post-onset of PD was 5.10 years ( $SD = 4.24$ ). At baseline, average UPDRS score was 23.15 ( $SD = 13.02$ ).

**Acoustic Measures:** There was an overall improvement in vocal function across all physical and functional speech tasks from pre- to post-treatment. There were also improvements in pre and partner. These improvements were consistent with those reported in previous LSVT studies.

**Communication Effectiveness Survey:** At baseline, mean self-rating on the CES was 18.87 ( $SD = 5.23$ ). After LSVT, this increased to 28.05 on average ( $SD = 2.55$ ) and this improvement was statistically significant ( $p < .01$ ). Scores on the CES improved for 12/13 participants (92%) as shown in Figure 1 below.

**Figure 1. Self-rated CES scores for each participant pre- and post-LSVT. (Note: black = better, red = worse)**

**Voice Handicap Index:** There was improvement noted in VHI score scores from 58.38 pre-treatment ( $SD = 20.57$ ) to 28.35 post-treatment ( $SD = 14.45$ ) but this improvement did not reach statistical significance ( $p > .05$ ). Across individual participants, pre- to post-VHI scores improved for 9/11 individuals (82%), but worsened for one participant (9/11) (18%), as shown below. No statistically significant difference was found for any of the three VHI subscales.


**Figure 2. Self-rated VHI scores for each participant pre- and post-LSVT. (Note: black = better, red = worse)**

### Conclusions

- Our findings suggest LSVT results in an improvement in functional communication for individuals with PD which is recognized both by individuals themselves and their partners.
- Improvements were noted across a range of vocal communication settings, with the least benefit for tasks involving phone use.
- Gains in functional communication were greater than those in self-perceived voice handicap, suggesting that the CES may be a more sensitive outcome measure for measuring post-LSVT changes than the VHI.

See Handout for Reference List

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