The Art and SCIENCE of Crafting a Poster

Sponsored by Delta Omega, the MPH Program, and the Professional Development Office

Susan Davis, MA

Former Director of Public Affairs
Johns Hopkins Bayview Medical Center

with Meghan Davis, DVM MPH PhD

Monday, November 18, 2013
Sheldon Hall (W1214)
Noon - 1:30pm

Poster Viewing in Feinestone Hall, 1:30-4:30pm
(Student poster presentations 1:30-2:15pm)
The Art and Science of Crafting a Poster

Susan Davis, MS

with Meghan Davis, DVM MPH PhD
What are scientific posters?
The Art

P. Susan Davis, M.A.
Types of communications

- Verbal
- Non-verbal
- Visual
- Written
Visual communications

- Posters
- Exhibits, displays
- PowerPoint presentations
- Videos
- Electronic media
Visual communications

• Posters
• Exhibits, displays
• PowerPoint presentations
• Videos
• Electronic media
Effective messages are...

- clear
- concise
- credible
- complete
- consistent
- correct
Planning process

• Research: who is your audience?
• Action: what is your message?
• Communication: how should you reach your audience?
• Evaluation: did you succeed?
Communication tool kit

• Color
• Typeface
• Design
• Layout
• Graphics
Color
Use color to:

• Highlight important elements
• Attract the eye
• Signal the reader where to look first
• Tie together a design or layout
• Organize elements
• Generate emotion
Color tips

• Use consistent color throughout your material
• Use color sparingly
• Choose a color from a graphic for text highlights
More color tips

• Cool colors recede (good for backgrounds)

• Warm colors advance

• Medium colors have low legibility

• Vibrant colors may vibrate

• Pale colors fade in small formats

• Avoid red and green combinations (color blindness)
Color combinations
www.signsbytomorrow.com/winston-salem/color_usage.aspx
Type
Type cast

• **Family of type**
  All the variations of a particular typeface

• **Font**
  A complete set of characters of the same size and style for a particular typeface
  
  *Times New Roman 28pt Regular*
Just my type

• Type has a voice and personality
  — your message determines what’s best

This has a light voice and personality
This is a more thoughtful, serious typeface
This is good for financial reports
Type cast outs

- Underlining
- Using ALL CAPITALS
- Starting Every Word in a Sentence With a Capital
- Using *italics* or **bold** in large doses
- Using outline type
Type tips

• Set body copy between 10 and 12 points for best legibility
• Use larger fonts for seniors and children
• Beef up point size for fancy fonts
Readability radar

• Make paragraph beginnings clear
  – Indent or block style (not both)
• Set text flush left, rag right
• Avoid justified and centered type
• Use one space after periods
• Keep line lengths between 30 and 70 characters
So many typefaces

There’s a thin line between variety and clutter

What’s enough?

- One typeface is rarely enough
- Two is just right
- Third is ok for emphasis
- Four is too many
Type Combinations

• Counterpoint and contrast are stronger than harmony

For instance:
Use a serif typeface for headlines and sans serif for body copy
Type Zen

• Combine typefaces of similar proportions

Awkward:
Times and Helvetica have different proportions

Better:
Arial and Times have similar proportions
Text size

• Make sure the viewer can read text
  – Titles at least 85 points
  – Subheadings 36 points
  – Body text 24 points
  – Captions 18 points
Poster design

• Navigate left to right
• Choose the most important element and make it dominant
• Avoid clutter
• Make it a snack, not a banquet
Styles

Wide
(3-4 columns)

Tall
(2-3 columns)
Design and layout

Images with permission of *Johns Hopkins Magazine*
What’s the difference?

• Design provides the overall look of a publication, presentation or Web site

• Layout provides the page structure and reflects the overall design
Layout aids

Use grids to organize your layout
Got 10 minutes? Micro-volunteer

A senior director for paper manufacturer's 3M who was running a campaign for repeatedly co-authoring research on the power of small volunteers through social networking told Howie to move campaign volunteers, the first use of social media in a large scale election, he

that this from Twitter to Facebook toward helping good causes.

He believes he has created some new

volunteer website called Sparked.co. Through

a website, Sparked enables people to

volunteer even if they spend just a few

minutes, even if they don't have a lot of

time. People will

be encouraged, for example, to spend a few

minutes at a time volunteering. Sparked

enables people to create a login for an

environmental group and collaborate online with

a quarter of an hour at a time, complete the

project. The website also facilitates volunteers

contributing to projects. It also provides a simple,

efficient framework for

managers to coordinate the efforts of all

voluteers.

In 2009 when Collier began developing what became Sparked, he was working on

a director to communicate from the Frager School's Advanced Research

Programs, but the project has grown so fast may be has

taken a leave of absence

teach graduate students

to create the website. Collier

published with digital engineer

that Eqally, Facebook or MySpace.

But Sparked has the

capacity to extend the

voluteer.

Sparked enables people to

"micro-volunteer" that is, apply small fragments of

spare time, literally five or 10

minutes, to various projects

that benefit nonprofits.

believes. Along the way he learned that when

people decided to volunteer, their most

cost was how long they felt it took. Despite

an explanation it to take a few free time,

this that connected research users spent more than

275,000 hours on Facebook and watch more

1 billion Youtube videos every day. With these

issues, Collier discovered to reduce some of

employees like Mitch Koppy and Esther

 undefine

Forbes.

and more than 2,000 nonprofits, partners and

partners are engage recent. Collier has

launched, and more than 26,000 volunteers, lately, more
Layout tips

• Use white space as part of the design
• Place important material in the upper left (most readers scan left to right)
• Position least important material in the lower right
• Make the most important element on the page the largest
More tips

• Establish a consistent hierarchy of type for headlines, subheads, text
  ▪ size
  ▪ style

• Make columns
  ▪ longer than they are wide
  ▪ wider than they are long or
  ▪ exactly square
Graphics

• add punch
• communicate faster than text
• attract the audience
• improve comprehension
• connect words to pictures
Choose the right graphic

• Appropriate to the theme, layout and audience
• Simple, but interesting
• Recognizable
• Engaging
 (use a photo instead of line art when possible)
Picture formats

- jpg or png: best for photos
- gif: good for graphics, cartoons
- eps: good for printing high-resolution illustrations
- Size: 300dpi best for print and presentations
  (72dpi for electronic formats)
Scientific graphics

• Use color instead of black and white
• Use unaltered data
• Choose images that enhance understanding
• Obtain collaborator or co-author approval
Charts and graphs

- Vertical bar charts: use to show changes in quantity over time (4-6 bars)
- Horizontal bar charts: use to compare quantities
- Line charts: use to demonstrate trends
- Pie charts: use to show percentages (limit to 4-6 slices) – *not recommended*
More points (also good for ppt)

• Write concise text
• Use strong verbs and active voice
• Follow the six-by-six rule
• Limit type to two (three max)
• Use upper and lowercase text
• Emphasize words with bold or color
Presenting your Poster

Photograph courtesy Dr. Amy Peterson
Presentation

• Plan
• Know what you intend to say
• Develop an outline
• Draft a script
• Have a theme (tell a story)
• Prepare & rehearse
Poster child

Posters have one additional element:

You

• Be clear
• Be ready
• Be calm
• Be enthusiastic
• Be judicious
• Be coordinated
The Science

Meghan Davis, DVM MPH PHD
Scope of work for a poster

• May be the same as for an original research article, or may be smaller
  – Sub-projects
  – Short communications
  – Case reports
  – New methods

• Choose work based on discussions with PI and co-authors
Sections of a Poster

• Introduction or Background
  – Goal or Aims
• Methods
• Results
• Conclusions or Discussion
• Acknowledgments / Funding
• References
• Contact information
Section construction

• Bulleted or (brief) sentence format
• Sections in different boxes or areas
• Left-to-right, top-to-bottom reading
• Conclusions at upper left or bottom right
Environmental Contamination with MRSA and Other Coagulase-Positive Staphylococci in the Homes of Patients Diagnosed with MRSA SSTI

Meghan F. Davis1, Sally Ann Iverson1, Patrick Baron1, Aimee Vasse2, Jackie Ferguson1, John Groopman1, Ellen K. Silbergeld1, Pam Tolomeo2, Kathleen G. Julian1, Daniel O. Morris2, & Ebbing Lautenbach3

1Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland USA; 2School of Veterinary Medicine, Tufts University, North Grafton, Massachusetts USA; 3School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania USA; 4Penn State Hershey Medical Center, Hershey, Pennsylvania USA; 5School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pennsylvania USA.

Background
Coagulase-positive staphylococci (CPS), particularly methicillin-resistant S. aureus (MRSA) and including veterinary pathogens such as methicillin-resistant S. pseudintermedius (MRSP), may be transmitted among humans, animals and environmental reservoirs, making consideration of household exposure in community transmission important.

Goal: To evaluate home environmental contamination with CPS bacteria, a pilot evaluation of 22 households from a larger clinical trial of community MRSA was conducted. Households were enrolled if a human member (index patient) had been diagnosed recently with MRSA skin or soft tissue infection (SSTI).

Methods
The Pet & Environmental Transmission of Staphylococci (PETTS) Study
In all homes, six environmental samples were collected using electrostatic cloths from standardized common room locations, and in most homes, a bed surface and the pillow of the index patient were sampled additionally (Figure 1). Pets and humans also were tested. Households were sampled initially and again three months after enrollment (Visit 2). All samples were cultured using a published method (Davis et al., AEM 2012). Columbia CMA blood agar was substituted for TSA blood agar. Baird-Parker phenotype was used for determination of coagulase-positive staphylococci (CPS). Representative isolates were tested using Kirby-Bauer disk diffusion methods to a suite of antimicrobial drugs (Figure 4). Cefoxitin resistance determined methicillin-resistance (MR) status.

Figure 1. Sampling locations within homes

Table 1. Household and participant characteristics by visit

<table>
<thead>
<tr>
<th>Visit</th>
<th>Number of homes, n (%)</th>
<th>Average number of human household members, n (SD)</th>
<th>Average number of pets, n (SD)</th>
<th>Average age of index patient, n (SD)</th>
<th>Number of homes with a child under 18 years old, n (%)</th>
<th>Bacteriologic, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit 1</td>
<td>23 (100%)</td>
<td>3.9 (2.3)</td>
<td>1.6 (2.5)</td>
<td>35.5 (22.9)</td>
<td>14 (65%)</td>
<td>1</td>
</tr>
<tr>
<td>Visit 2</td>
<td>11 (50%)</td>
<td>2.5 (1.2)</td>
<td>1.2 (0.3)</td>
<td>43.5 (21.5)</td>
<td>4 (18%)</td>
<td>2</td>
</tr>
</tbody>
</table>

p-value:
- 0.01
- 0.26
- 0.06
- 0.02
- 0.87

Table 2. MR-CPS home contamination by risk factor over time

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Visit 1</th>
<th>Visit 2</th>
<th>Longitudinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of human household members, n (%)</td>
<td>0.07 (0.17)</td>
<td>0.09 (0.05, 0.15)**</td>
<td></td>
</tr>
<tr>
<td>Average number of pets, n (%)</td>
<td>0.01 (0.05, 0.07)</td>
<td>0.00 (0.04, 0.04)</td>
<td></td>
</tr>
<tr>
<td>Average age of index patient, n (SD)</td>
<td>0.04 (0.29, 0.40)</td>
<td>0.00 (0.11, 0.11)**</td>
<td></td>
</tr>
<tr>
<td>Home with child under 18 years, n (%)</td>
<td>0.38 (0.10, 0.69)**</td>
<td>0.37 (0.30, 0.67)**</td>
<td></td>
</tr>
</tbody>
</table>

p-values:
- 0.05
- 0.04
- 0.01
- 0.01
- 0.01

Conclusions
Frequency of contamination of homes with MR-CPS was high, and the majority of the MR-CPS isolates likely are strains of MRSA. Home contamination may serve as a reservoir for re-exposure of household members following successful treatment or decolonization. Presence of children and household size may be associated with increased prevalence of positive sites for home contamination. This pilot study demonstrates the feasibility of conducting a larger project characterizing MRSA in the home.

Acknowledgements
This research was funded through the support of the Johns Hopkins Center for a Livable Future, the Morris Animal Foundation, and the American College of Veterinary Dermatology / American Academy of Veterinary Dermatology. We are deeply grateful to the research participants and the field and laboratory staff for their invaluable assistance. We also thank Dr. David Saks and his laboratory group for sharing space and resources.
Environmental Contamination with MRSA and Other Coagulase-Positive Staphylococci in the Homes of Patients Diagnosed with MRSA SSTI

Meghan F. Davis; Sally Ann Iverson; Patrick Baron; Aimee Vasse; Jackie Ferguson; John Groopman; Ellen K. Silbergeld; Pam Tolomeo; Kathleen G. Julian; Daniel O. Morris; & Ebbing Lautenbach

1. Introduction: The prevalence of methicillin-resistant Staphylococcus aureus (MRSA) has been on the rise, particularly in healthcare settings and among individuals with certain risk factors. This study aimed to investigate the environmental contamination with MRSA and other coagulase-positive Staphylococcus species in the homes of patients diagnosed with MRSA skin and soft tissue infection (SSTI).

2. Methods: The Pet & Environmental Transcription of Staphylococci (PETS) Study was conducted in 22 households. Environmental samples were collected from common room locations, and homes were sampled twice: at the initial visit and after three months. MRSA was detected using methicillin resistance detected on 3% sodium chloride agar. Representative isolates were tested for MRSA using the cefoxitin disk diffusion method.

3. Results: Initial visit (visit 1): 91% of households had environmental surfaces that were MRSA-positive. The prevalence of MRSA in human household members was 59%. Prevalence in companion animals was 34%. Household contamination was weakly positively correlated (r=0.23) with environmental contamination (p=0.05). At the initial visit, 82% of households were contaminated with multi-drug-resistant CPS. Three-month visit (visit 2): Compliance rates for the second visit were 50%. At the three-month visit, 64% of households and 36% of environmental surfaces were MRSA-positive, and 18% of households were contaminated with multi-drug-resistant CPS. The prevalence of MRAP among 20 human household members tested (2 households) was 70%, and among 15 companion animals was 7%. At the second visit, concurrent human carriage was strongly correlated (r=0.66) with environmental contamination (p=0.03).

4. Conclusions: Frequency of contamination of homes with MRSA was high, and the majority of the MRAP isolates likely are strains of MRSA. Home contamination may serve as a reservoir for re-exposure of household members following successful treatment or decolonization. Presence of children and household size may be associated with increased prevalence of positive sites for home contamination. This study demonstrates the feasibility of conducting a larger project characterizing MRSA in the home.

5. Acknowledgements: This research was funded through the support of the Centers for Disease Control and Prevention (CDC), the American College of Veterinary Dermatology, and the Academy of Veterinary Dermatology. We also thank the research participants and the field and lab research team. We also wish to thank Dr. Dianna Davis for her support in conducting this study.

6. Table 1: Household and participant characteristics by visit

<table>
<thead>
<tr>
<th>Table 2: MRAP home contamination by risk factor over time</th>
<th>Visit 1</th>
<th>Visit 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of MRAP household members (%)</td>
<td>6.37 (0.9)</td>
<td>3.91 (1.2)</td>
</tr>
<tr>
<td>Average number of MRAP (%)</td>
<td>0.00 (0.06)</td>
<td>0.00 (0.06)</td>
</tr>
<tr>
<td>Average age of MRAP (%)</td>
<td>6.37 (0.9)</td>
<td>3.91 (1.2)</td>
</tr>
<tr>
<td>Number of MRAP with child under 18 years old (%)</td>
<td>0.00 (0.06)</td>
<td>0.00 (0.06)</td>
</tr>
</tbody>
</table>

7. Figure 1: Sampling locations within homes

8. Figure 2: Longitudinal study design
Introduction/Background

• Make one to three important points
• Place research in larger context
  – Significance to field
• Include goal of research as last point
  – Specific Aim(s)
  – Can be separate section
  – May emphasize with bold text or color
Methods

- Keep brief!
- Can use smaller type
- Consider graphical methods
Example: graphical methods

Environmental Sampling

Salt broth enrichment

Antimicrobial broth enrichment

Columbia CNA Blood Agar (staph-selective)

Baird-Parker Agar (CPS)

Antimicrobial Susceptibility Testing

PCR (nuc, mecA) &

PFGE & whole genome analysis (subset)
Results

• Highlight your important results
• Use tables and figures
• Make each element interpretable on its own
  – Include important details as legend material
  – Include a title and label all axes, rows or columns
What goes where?

• Same criteria as for an original research article
• Guidelines
  – STROBE (observational epi studies)
  – CONSORT (controlled trials)
  – PRISMA (systematic reviews)
<table>
<thead>
<tr>
<th>Item</th>
<th>Item Number</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title and abstract</td>
<td>1</td>
<td>(a) Indicate the study’s design with a commonly used term in the title or the abstract.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) Provide in the abstract an informative and balanced summary of what was done and what was found.</td>
</tr>
<tr>
<td>Introduction</td>
<td>2</td>
<td>Explain the scientific background and rationale for the investigation being reported.</td>
</tr>
<tr>
<td>Background/rationale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objectives</td>
<td>3</td>
<td>State specific objectives, including any prespecified hypotheses.</td>
</tr>
<tr>
<td>Methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study design</td>
<td>4</td>
<td>Present key elements of study design early in the paper.</td>
</tr>
<tr>
<td>Setting</td>
<td>5</td>
<td>Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection.</td>
</tr>
<tr>
<td>Participants</td>
<td>6</td>
<td>(a) Cohort study: Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Case-control study: Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross-sectional study: Give the eligibility criteria, and the sources and methods of selection of participants.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) Cohort study: For matched studies, give matching criteria and number of exposed and unexposed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Case-control study: For matched studies, give matching criteria and the number of controls per case.</td>
</tr>
<tr>
<td>Variables</td>
<td>7</td>
<td>Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.</td>
</tr>
</tbody>
</table>
Displaying Results

http://www.edwardtufte.com/tufte/books_vdq
Figures: do

• Label all axes
• Include sample sizes
• Keep color and terminology consistent
Figures: don’t

- Make the message too complicated
- Use 3-D bar charts (some exceptions)
- Use pie charts

Cawley S, et al. (2004) Unbiased mapping of transcription factor binding sites along human chromosomes 21 and 22 points to widespread regulation of noncoding RNAs. *Cell* 116:499-509, Figure 1 – see discussion on http://www.biostat.wisc.edu/~kbroman/topten_worstgraphs/
Conclusion / Discussion

• Emphasize important findings
• Include limitations of research
• Make fewer than six points
Other Sections

- Acknowledgments / Funding
  - Can use graphics

- References & Contact Information
  - Can be small type

- Contribution of presenting author
  - Optional, but should be included for Delta Omega & certain other student competitions
Rule of Thumb

A visitor to your poster should be able to locate and understand your most important findings within five minutes.

Tip: Print copies of your poster or poster abstract for visitors to take as a reminder – include your contact information!
Resources (1)

- Johns Hopkins logos & templates
  
  http://www.jhsph.edu/identity/
Resources (2)

• Johns Hopkins Identity Initiative
  http://identity.jhu.edu
Resources (3)

• Printing your poster
  – Check with your department
  – Explore commercial printing options

• Traveling with your poster
  – Check art supply stores for poster tubes
  – Consider printing on fabric
Design Programs

• Powerpoint
  – Poster size (File > Page Setup)

• Adobe CreativeSuite*
  – Illustrator
  – InDesign

* Available from SPARS at a discount
Powerpoint tip
Adobe Illustrator tip
Delta Omega Poster Competition

- Typically in February – deadlines TBA
- Two categories
  - Applied Research (epidemiology)
  - Laboratory Research (basic science)
- Cash prizes in each category
  - first ($500)
  - second ($300)
  - third ($200)

http://www.jhsph.edu/alumni/alumni-associations/delta-omega/poster-competition/competition-rules.html
See Poster Examples

• NOW!

• Feinstone Hall
  – Students available to present posters 1:30-2:15 p.m.
  – Posters will be up through 4:30 for viewing
Questions?
Writing resources

Purdue Language Lab
http://owl.english.purdue.edu/

U.S. Government
www.plainlanguage.gov/

NIH
www.nih.gov/clearcommunication/plainlanguage/index.htm