How to Prepare an Effective Poster Presentation

February 27, 2013
3:00 PM ET
Announcements

- Presentation slides and archived audio recording will be available a few days after the webinar at: [http://bmes.org/elearning](http://bmes.org/elearning)

- You may submit questions throughout by using the online chat function

- Questions will be addressed at the end

- Please take a few minutes to complete the brief survey following the webinar to provide feedback

[BMES Biomedical Engineering Society™]
Polling Questions

- Which of the following best describes you?
  - Undergraduate student
  - Graduate student
  - Early career professional
  - Faculty
  - Other

- Have you ever presented a poster before?
  - Yes
  - No
BMES webinar #1: How to Prepare an Effective Poster Presentation

Part I: anatomy of a poster

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February 27, 2013 - 3:00pm ET
Anatomy: the nuts and bolts

1. Assess – audience and your motivation
2. Assemble content
   – like any presentation or paper
3. Organize your information - simplify
   – Identify important message, supporting info
   – Develop flow, minimize text
4. Design visuals
   – Text types and sizes
   – Do’s and don’ts for graphics
5. Assemble the poster
   – General best practices

BMES 2011 Annual Report
Assess... to guide decisions

• Target audience and time they’ll spend?
  – Lay person?
  – Scholar from a your field or different field?
  – Student paper competition?

http://bmes.org/
Assess... to guide decisions

• Target audience and time they’ll spend?
  – Lay person?
  – Scholar from a your field or different field?
  – Student paper competition?

• Your motivation?
  – Inform?
  – Persuade?
  – Establish yourself or compete?

http://bmes.org/
Assemble content

- Effective title - professional tone
- List coauthors & institutional affiliations (w/logos)
- Abstract – optional (next slide)
- Introduction - background and goal (highlighted)
- Materials & Methods
- Results – quantitative and qualitative - graphical
- Discussion, conclusions, future
- Acknowledgments (esp. funding)
- References – can use abridged style
Abstract (optional)

1. Significance and scope of broader problem
2. Gap in knowledge
3. Your specific goal/hypothesis (to fill gap)
4. Methods used (general approach/synopsis)
5. Qualitative & quantitative results (ranges and/or mean ± SD, stats if possible)
6. Discussion with comparison with literature and short conclusion (don’t forget concl)
Organize info - simplify

• Space is limited, what’s most important?
  – It’s a presentation – not stand alone document

• Take-away message
  – One core idea - Not details
  – Key supporting information?
Organize info - simplify

- Space is limited, what’s **most** important?
  - It’s a presentation – not stand alone document

- Take-away message
  - **One** core idea - Not details
  - Key supporting information?

- Bullets, no paragraphs
  - shoot for 7 entries max
  - group concepts

- Visual flow
  - Direct the reader - left-right, arrows, and/or numbers
  - Start with 3 columns, but don't be constrained
Design visuals – do’s and don’ts

• Less text, more figures
  – Images, charts, graphs, timelines, and diagrams
  – Avoid tables (graph the data)
Design visuals – do’s and don’ts

• Less text, more figures
  – Images, charts, graphs, timelines, and diagrams
  – Avoid tables (graph the data)

  ![Graphs](utexas.edu/ugs/our/poster/create_message/design)

  – Use consistent colors (as above, but need contrast)
  – Caption below, not titles (NOT as above)
  – Cross lines only when necessary, sig figs!
Sig figs

• Use proper significant figures

• Highlight important comparisons - differences, changes, and trends – not specific numbers

Source: Saturday Morning Breakfast Cereal
Design visuals – specifics

• Entering graphs/plots
  – I generally paste picture (JPG or PNG, not TIFF) from Excel or similar - avoids resizing issues and linked files
  – No background instead of white
Design visuals – specifics

• Entering graphs/plots
  – I generally paste picture (JPG or PNG, not TIFF) from Excel or similar - avoids resizing issues and linked files
  – No background instead of white

• Photos
  – 150 dpi (or even 300 dpi)
  – or line art/emf
Axes and fonts

Image Source: XKCD
Axes and fonts

- Use proper axes
- Use large enough font to see from 3 feet
- Sans serif (Arial) rather than serif (Times)
- Comedy only if relevant...

Image Source: XKCD
Poll: Which poster would you like to read?  A, or B?
Poll: Which poster would you like to read?  A, or B?
Open comments: Are there any suggestions for improvements?
Background and colors

• Background
  – Check your university/lab for template
  – Color costs more to print
    • Hard to read dark on dark

[Link to design resources: utexas.edu/ugs/our/poster/create_message/design]
Background and colors

• Background
  – Check your university/lab for template
  – Color costs more to print
    • Hard to read dark on dark
  – Picture background – expert
    • Obscures graph details
    • Red on green

• Colors
  – Don’t clash, but use contrast
    • no red on black or yellow on white
  – Be cognizant color blind (red/green)
  – I suggest dark text on light background

utexas.edu/ugs/our/poster/create_message/design
Assembling the poster

• Size and format
  – Generally landscape
  – In Powerpoint: Design\Page Setup

  ![Page Setup](image)

  – Don't need to fill entire poster board
    • e.g., 4'x8' is VERY big
Assembling (cont)

- White space – not enough -->
  - Divide sections w/ empty space

utexas.edu/ugs/our/poster/create_message/design
Assembling (cont)

• White space – not enough --->
  – Divide sections w/ empty space

• Printing
  – Printing individual slides - not advised
  – Send PPT and PDF to campus printing service (~$30-$50)
  – Kinkos/Fedex ~ $8/sq. ft. (start at ~$50)
  – Compress pictures - size of files < 5 MB if possible

utexas.edu/ugs/our/poster/create_message/design
Chicken Femur Model of Osteoporotic Bone

Student Names: BME3504, Group 4, B-Tech 1
Biomedical Engineering Department, Worcester Polytechnic Institute

Abstract

Over 1.5 million bone fractures each year in the U.S. are attributed to osteoporosis. Osteoporosis is a skeletal disorder that causes bones to break down faster than they are formed [1]. Fractured osteoporotic bones (OB) are difficult to fix. Comparative testing is necessary to determine a plating system that best fixes fractured OB. However, cadaveric OB vary too greatly to use for comparison [2]. The goal of this study was to develop a biomechanically sound model of OB to be used in the comparison of fracture fixation plating systems. To be considered osteoporotic, the model must have 61.3% of the ultimate tensile strength (UTS) of normal bone (NB) [3]. Chicken femurs were separated into 4 groups; a control group and 3 experimental groups. Each experimental group was treated with 0.6M hydrochloric acid (HCl) for different set periods of time [4]. Three-point bending tests were conducted on the bones to compare the mechanical properties of each group. From initial testing, it was predicted that the bones would reach osteoporotic UTS after being treated for 33 hours. After final testing, it was determined that it would take 37 minutes for the bones to reach osteoporotic UTS in 0.6M HCl. Chicken femurs treated in HCl were found to make a model of OB that can be easily reproduced for the comparison of fracture fixation plating systems.

Methods

- Chicken femoral bones were used as models — they have similar microstructural characteristics to human bones [5].
- The bones were treated in 0.6M HCl baths for varying increments of time between 0 and 6 hours.
- Three-point bending tests were conducted on the bones with a loading rate of 0.1mm/sec [6].

Table 1: Compilation of the measurements and the calculations for each bone tested in the control and experimental groups treated for 30, 60, and 90 minutes.

<table>
<thead>
<tr>
<th>Group</th>
<th>Specimen</th>
<th>L (mm)</th>
<th>D (mm)</th>
<th>B (mm)</th>
<th>UTS (MPa)</th>
<th>Rm (MPa)</th>
<th>Fmax (N)</th>
<th>FVm (N/mm)</th>
<th>Rp (N/mm)</th>
<th>Pin (Nmm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3.86E-02</td>
<td>11.06</td>
<td>7.99</td>
<td>2.93</td>
<td>431.76</td>
<td>4.16</td>
<td>3.95E+05</td>
<td>3.29E+05</td>
<td>1.37</td>
<td>59.52</td>
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<tr>
<td>3</td>
<td>3.86E-02</td>
<td>9.25</td>
<td>7.85</td>
<td>2.55</td>
<td>221.02</td>
<td>2.13</td>
<td>1.98E+05</td>
<td>1.53E+05</td>
<td>0.84</td>
<td>28.06</td>
</tr>
<tr>
<td>3</td>
<td>3.86E-02</td>
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<td>7.86</td>
<td>2.65</td>
<td>365.12</td>
<td>3.17</td>
<td>2.47E+05</td>
<td>1.94E+05</td>
<td>1.37</td>
<td>68.31</td>
</tr>
<tr>
<td>3</td>
<td>4.48E-02</td>
<td>5.45</td>
<td>7.66</td>
<td>2.37</td>
<td>270.23</td>
<td>3.05</td>
<td>2.02E+05</td>
<td>1.58E+05</td>
<td>3.81</td>
<td>17.19</td>
</tr>
<tr>
<td>3</td>
<td>4.48E-02</td>
<td>5.77</td>
<td>7.72</td>
<td>2.68</td>
<td>315.56</td>
<td>3.85</td>
<td>1.82E+05</td>
<td>1.39E+05</td>
<td>2.92</td>
<td>18.37</td>
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<td>7.72</td>
<td>2.68</td>
<td>277.62</td>
<td>3.11</td>
<td>1.94E+05</td>
<td>1.55E+05</td>
<td>2.89</td>
<td>16.72</td>
</tr>
<tr>
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<td>4.48E-02</td>
<td>5.77</td>
<td>7.72</td>
<td>2.68</td>
<td>245.51</td>
<td>3.51</td>
<td>2.04E+05</td>
<td>1.69E+05</td>
<td>3.24</td>
<td>16.72</td>
</tr>
</tbody>
</table>

Results

- Too much raw data in table
- Table 1 contains the measurements and calculations for each bone tested in the control and experimental groups treated for 30, 60, and 90 minutes.

Figure 1: Chicken femoral bone sample displayed on 3-point bending apparatus.

Figure 2: Diagram of cross-section of bone (OB).
- Initial testing was conducted to determine the time that the model reaches osteoporotic UTS.
- Equations 1-5 were used to calculate the UTS.
- The resultant mean UTS is 37 minutes.
- The mean UTS for each group determined a smaller set of times to treat the bones.
  - From the analysis of the initial tests, new times of 0, 30, 60, and 90 minutes were chosen.
  - The UTS of the chicken femur as found in literature was 96MPa [7]. If the control bones show similar UTS properties to those in literature, to be considered osteoporotic, 81.3% of NB UTS, the bones should exhibit a UTS of 78.6MPa [3].

Figure 3: Representative Force-displacement plot with linear fitting of a sample control bone. The slope of the linear fit is used as the (P/V) value in calculating the E (Equation 1).

Figure 4: Sample bones after being subjected to a compressive force on the 3-point bending apparatus. The bones failed transversely.

Nice pictures – but not every sample needed

- The similarity in treatment time supports the reproducibility of this model.
- Limitations:
  - The E values were not analyzed in the making of this model – the values did not show to be consistent with the treatment times.
  - The chicken femoral bone is smaller than the human bones that would need the fracture fixation plating systems – may be difficult to compare.
  - A greater sample number should be tested and measured with more accurate tools.
  - Work should be done to create a model that can have both osteoporotic UTS and E.

Acknowledgements

Thank you to: Dr. Kristen Billiar, Mathilda Rudnicki, & Lisa Wall

References

Background color makes poster stand out – but minimal actual area covered

Use bullets instead of paragraphs

Color helps table

Fun rotated photos... for lay audience
Checklist

• Effective Title
• Clear objective and main conclusion
• Logical flow
• Legible text and graphics
• Multiple types of visual aides
• Consistent graphics (e.g., colors)
• White space
• Proper acknowledgement and citations
Acknowledgements and resources

Special thanks to:

- Zoe Reidinger (Ph.D. candidate, WPI)
- The University of Texas at Austin – images and content
  - Office of Undergrad Research & Center for the Core Curriculum - School of Undergraduate Studies

Resources

- Worcester Polytechnic Institute, Academic Technology
  - http://www.wpi.edu/Academics/ATC/Media/poster-tips.pdf
- The University of Texas at Austin
  - http://www.utexas.edu/ugs/our/poster
- Stanford
  - http://ppop.stanford.edu/posters.html
Poster Presentations
More than just the poster…

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Outline

1. Audience identification
2. Engage presentation
3. Networking
4. Other resources
5. Take-home messages
Know Your Audience

• Who will you be speaking with?
• What way will you peak their interest?
• How can you adjust your presentation?

http://www.mnmas.org/
Know Your Audience

• Example: BMES Annual Meeting
  – Biomedical engineers
  – Broad backgrounds and interests
  – Hoping to view many posters
Engaging Presentation

• Prepare a 2-4 minute talk
  – Provide a clear background
  – Focus on highlights and figures
  – Summarize major points
    • Put work in larger context

• Practice talk beforehand
  – Scientific colleagues and others
  – Incorporate feedback

http://web.mit.edu/bmes/www/PosterSession.html
Questions to Ask

- Ask to take others through your work
  - "Would you like an overview of my poster?"
- Find out their background
  - "Do you have any particular interests?"
- Make it a conversation
  - "Does that make sense?"
Polling Question

When presenting a poster, should you look at:

1) The poster?
   • That is the most important aspect

2) The viewer?
   • They should be your primary focus

3) Both the poster and the viewer?
   • Directing attention
Human Interactions

• One engaged viewer attracts others
• Firm handshake
• Make eye contact
• Be confident
  – But don’t be afraid to say you don’t know

http://clearedjobs.net/blog/9-interviewing-mistakes-security-cleared-job-seekers-should-avoid/handshake/
Communicating Effectively

- Speak clearly and slowly
- Ask if anyone has questions
- Smile and have fun 😊

Interactive Posters?

- Animations
  - Laptop, phone, tablet
- Physical objects
  - Show-and-tell
- Demonstrations

LOOK AT ALL THE ATTENTION MY POSTER IS GETTING!

PROF. CHRIS WEISS, TEXAS TECH UNIVERSITY

DR. BRAD SMULL, NATIONAL SCIENCE FOUNDATION

DOYLE RICE, WEATHER EDITOR USA TODAY

Polling Question

Do you bring business cards to conferences?

1) Yes
   • Carry them with me at all times!

2) Sometimes
   • When I don’t forget.

3) No
   • Why would I need those?

4) What is a business card?
Handouts

• Contact information exchange
  – Business cards
  – Phone bump
    • http://www.youtube.com/watch?v=4kCXKrAbdiQ
  – Ask for their information
• Legible paper printout of poster
  – Also available online
• Pamphlets, publications, etc.
After the Conference

• Learn about those who stopped by
• Follow up with emails and phone calls
  – Thank them for their interest
  – Send supporting publications
• Connections can last
Other Resources

• Preparing and presenting effective research posters
  – http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1955747/

• Ten simple rules for a good poster presentation

• Mortal sins in poster presentations (how to give a poster no one remembers)
Other Resources

• Practicing your poster presentation
  – http://www.tc.umn.edu/~schne006/tutorials/poster_design/practice_01.htm

• Do's and don'ts of poster presentations
Take-Home Messages

1. Know your audience
2. Develop engaging presentation
3. Be confident
4. Network before, during, and after
5. Have fun!
Polling Question

Do you know feel more confident about how to prepare an effective poster presentation?

1) Yes
   - This was helpful

2) Somewhat
   - Still confused about some aspects

3) Not really
   - I was an expert already
Acknowledgements

• Amy Bogucki, Purdue University
Thank you for your attention!

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QUESTIONS?
BMES Annual Meeting (Seattle, WA): Sept 25–28
  ◦ Call for Abstracts Submission Deadline: April 2

Professional Development Webinars
  ◦ Grant Writing: March 27
  ◦ Industry Career Development: April 17
  ◦ Best Practices for Teaching: May 16
  ◦ Leadership Development & Networking: Aug 27
  ◦ Best Practices for Running & Managing a Lab: Nov 7

Career Events
  ◦ Bay Area Mixer (San Jose, CA): Mar 26
  ◦ Midwest BME Career Conference (Chicago, IL): April 19
  ◦ Southeast & Mid–Atlantic BME Career Conference (Washington, DC): Oct 25