

# Scientific Poster Design

How to keep your poster  
from resembling an  
“abstract painting”



# CCMR

Cornell Center for Materials Research

Cornell University, Ithaca, NY

<http://www.ccmr.cornell.edu>



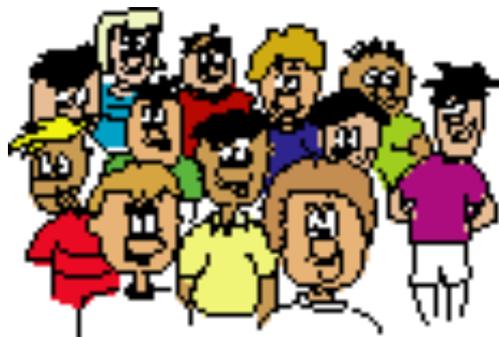
# A poster can be better than giving a talk

More efficient because:

- you totally bomb at giving talks
- can be viewed while you nap
- can hang in the department for years
- can reach folks not in your field of research

## Posters serve as...

An advertisement of your hard work



Kool, wow!, check  
this out!, you must  
be smart!



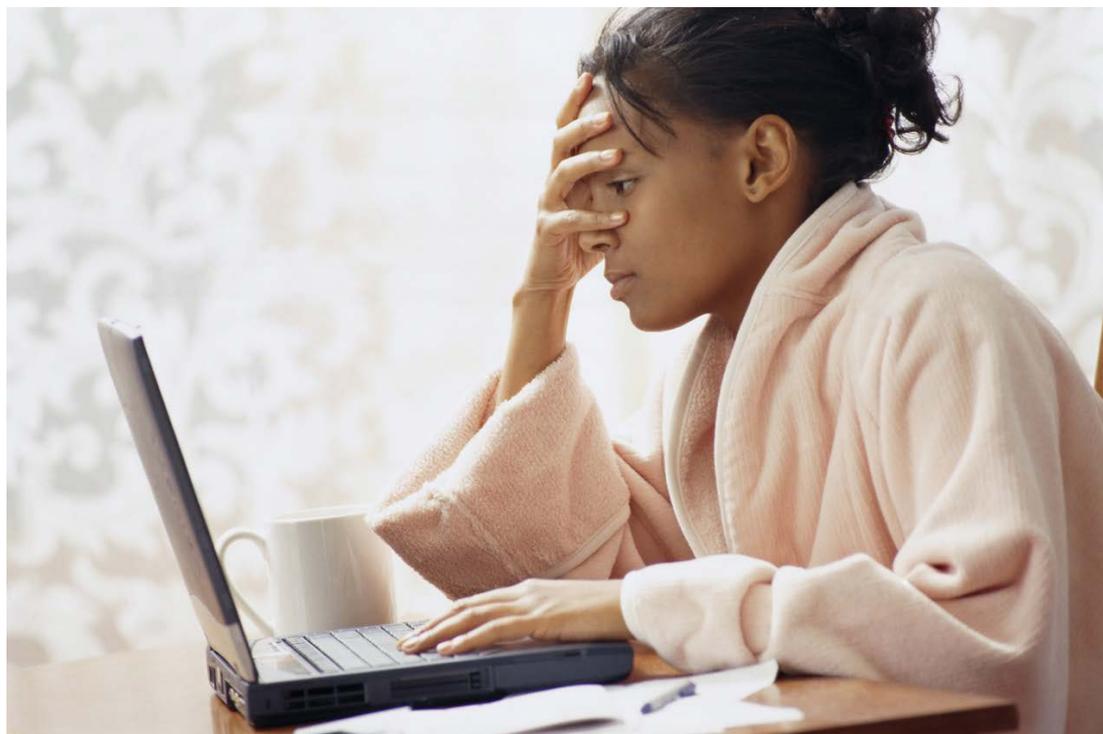


# Is my abstract effective?

- Why should anyone care?
- What am I adding to current knowledge?
- Do I need to explain methods?
- Have I told them what I found and recommend?



# A portrait of a grad student

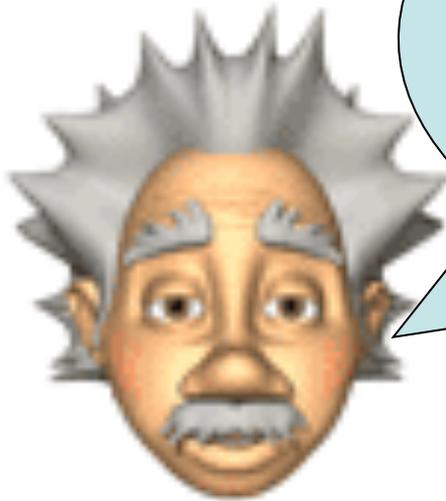


@#&%!@#\$, I have 12 hours to throw this thing together and get it printed before it's due.

## How do I get months and years of research onto my poster?

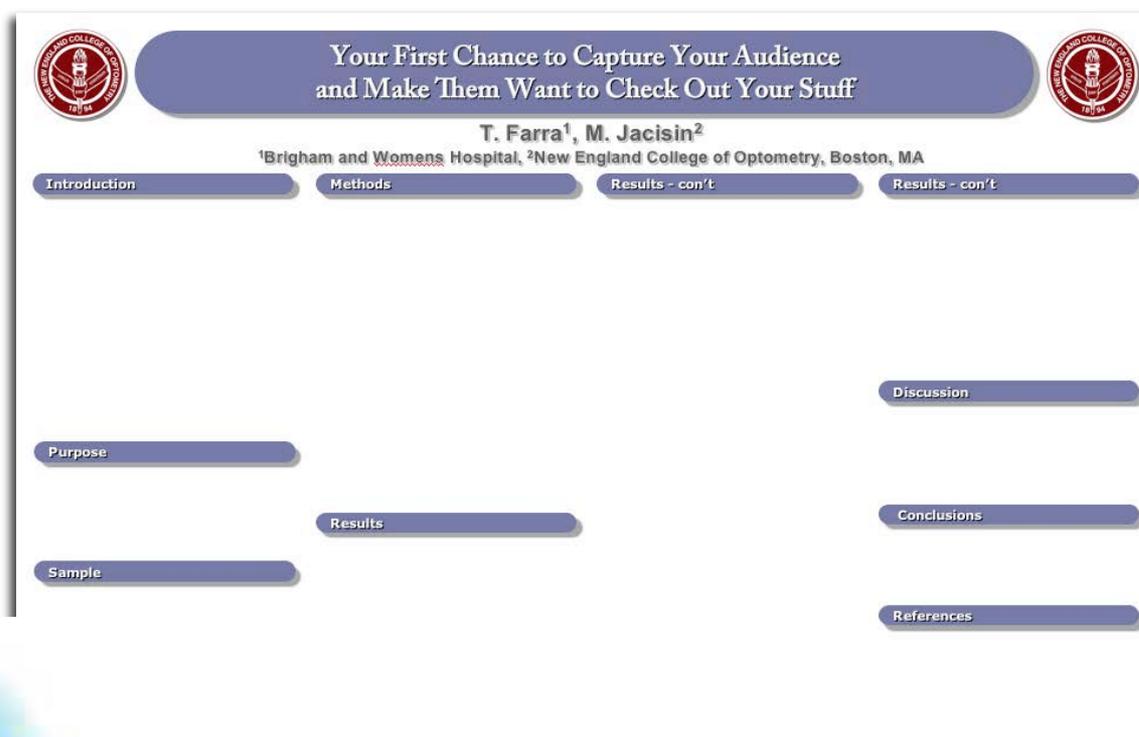


- Your poster is a short story
- Describe a few major points
- Arouse the reader's interest to read on
- Limit it to 250 words



Recite after me,  
Less is best!

# Simplify your paper into poster format

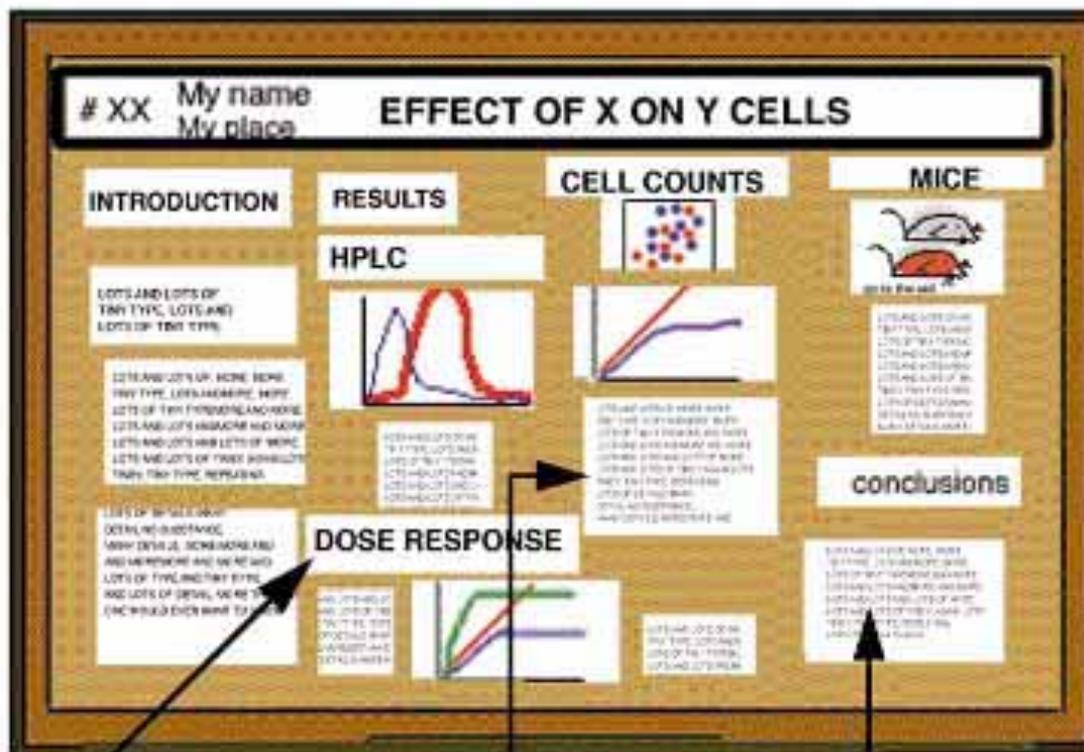


Find out the size required!

# Who's my audience?



Remember, most of these “scientists”  
come for the free booze



Large type states methods, not results

Results artfully buried in a methods description

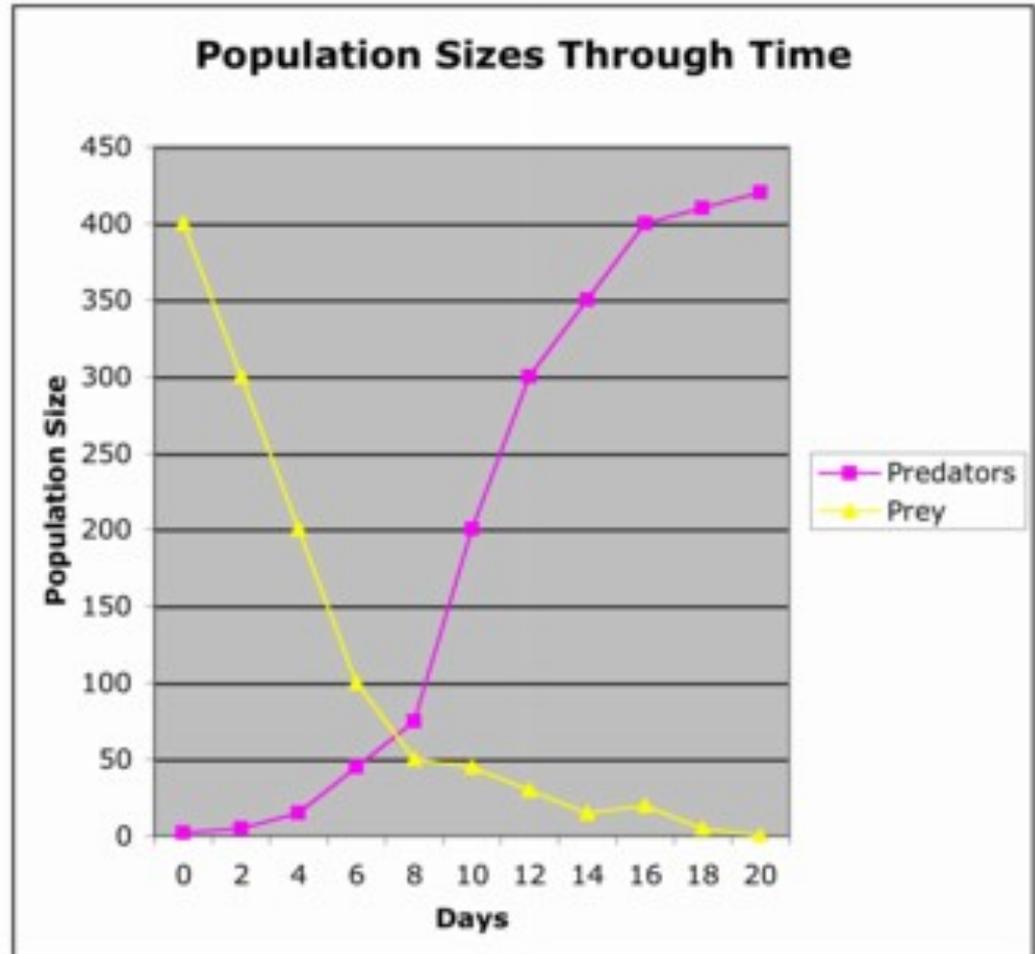
Carefully omits interpretations

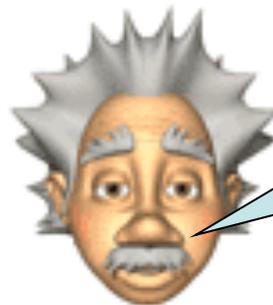
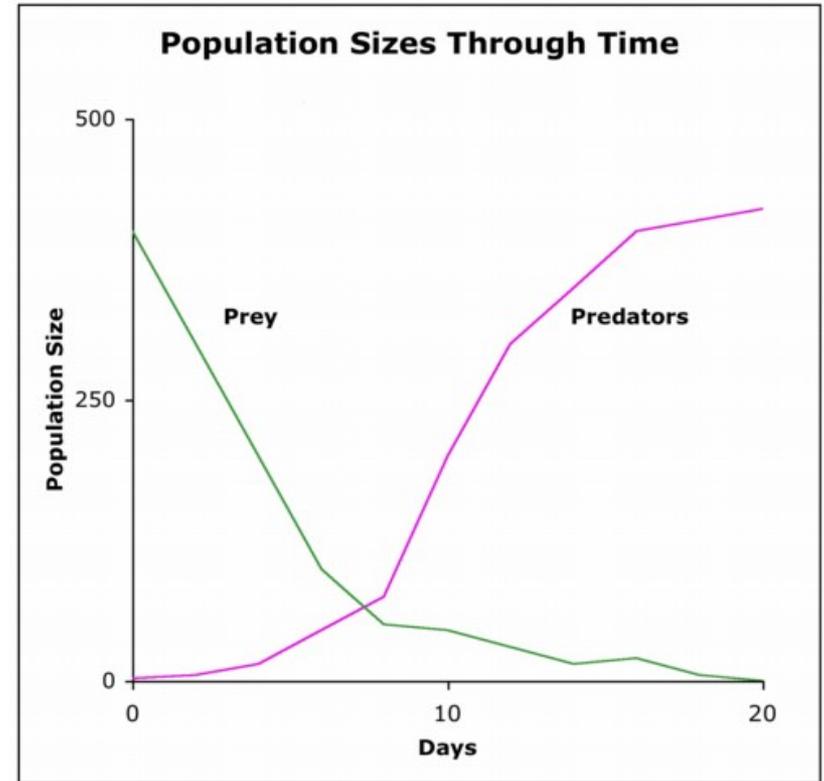
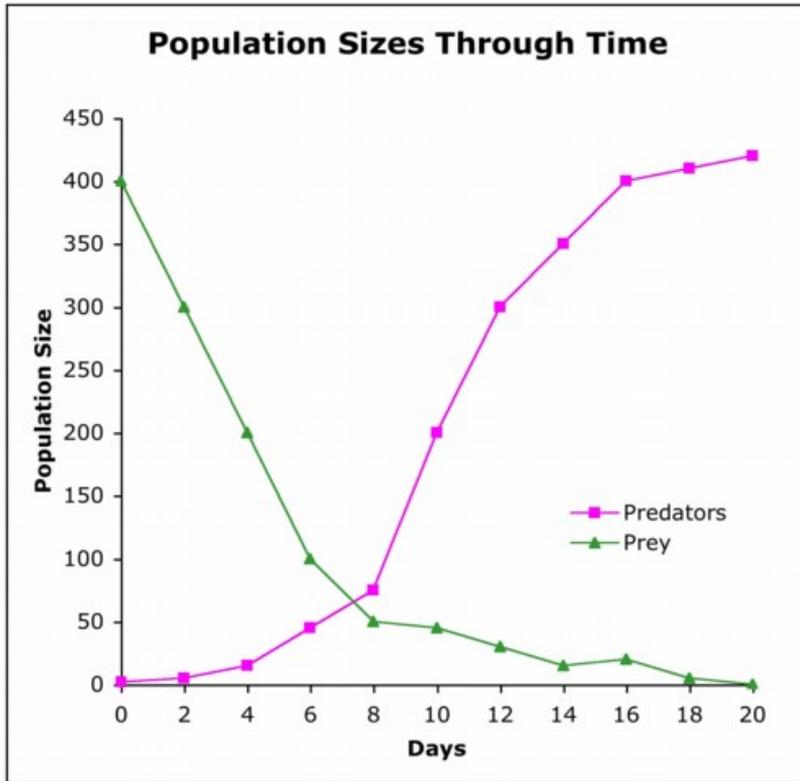


Start putting  
together your  
2 main elements

# 1) Simple, effective data displays

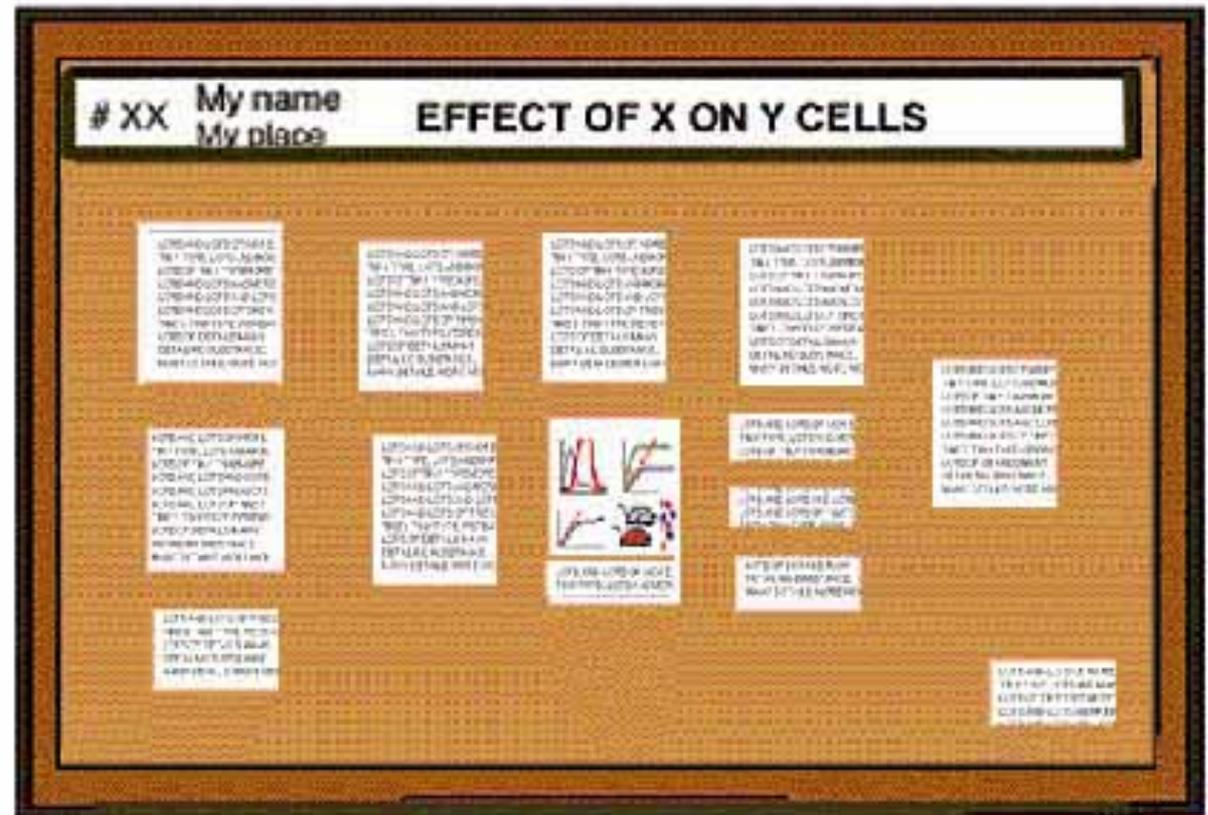
*Don't make them stand on their heads to read your data!*





Keep it simple but effective

## 2) Small blocks of supporting text



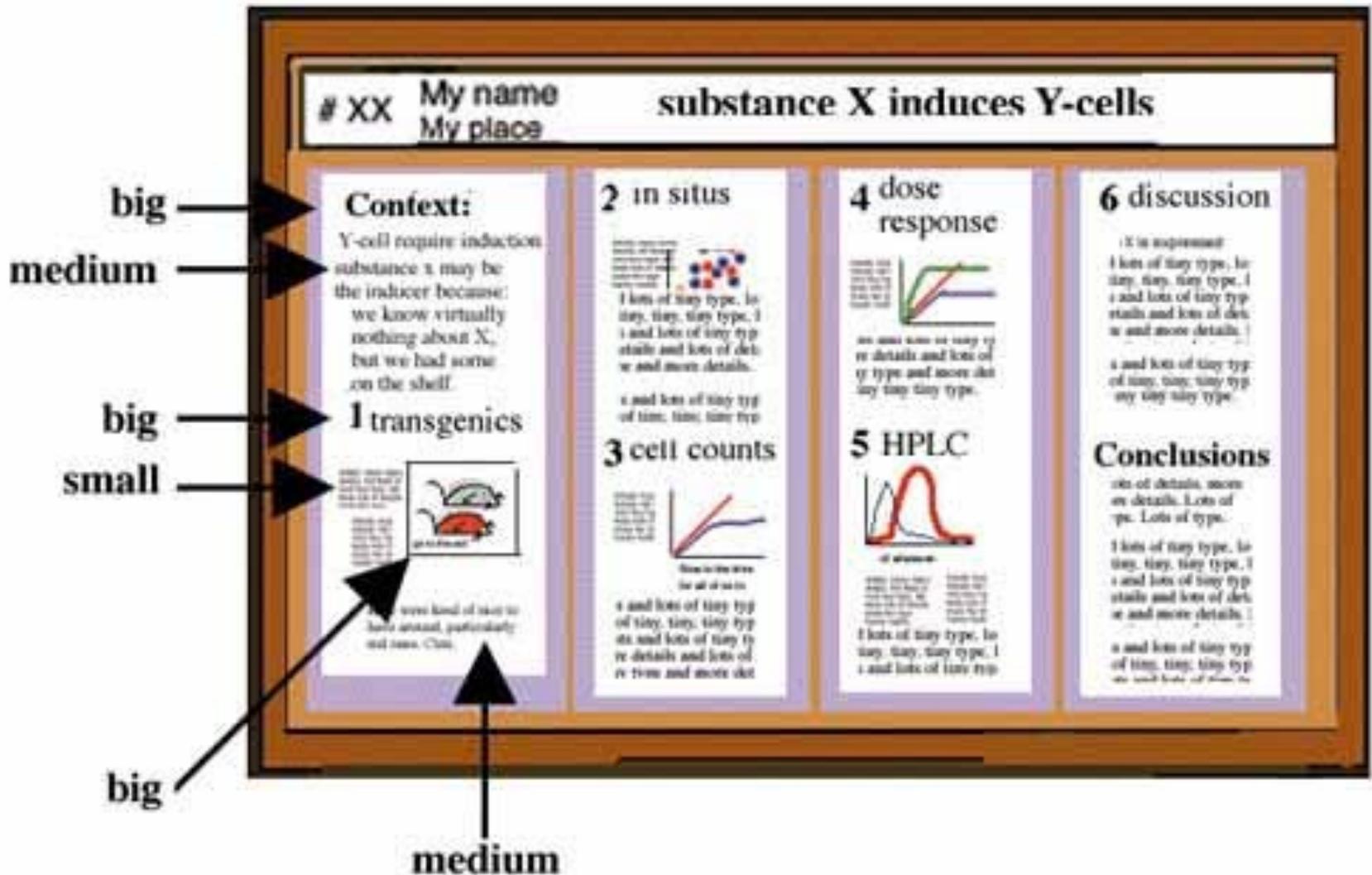
The need for chairs in front of your poster will not go over well



## Your copy should answer...

# XX	My name My place	EFFECT OF X ON Y CELLS
Why?	Methods?	What do I recommend?
What am I adding?	What did I find?	

# I could actually read this







# Pick a software program

Although you' ll probably gravitate towards PowerPoint,  
consider a true design program.

# PowerPoint

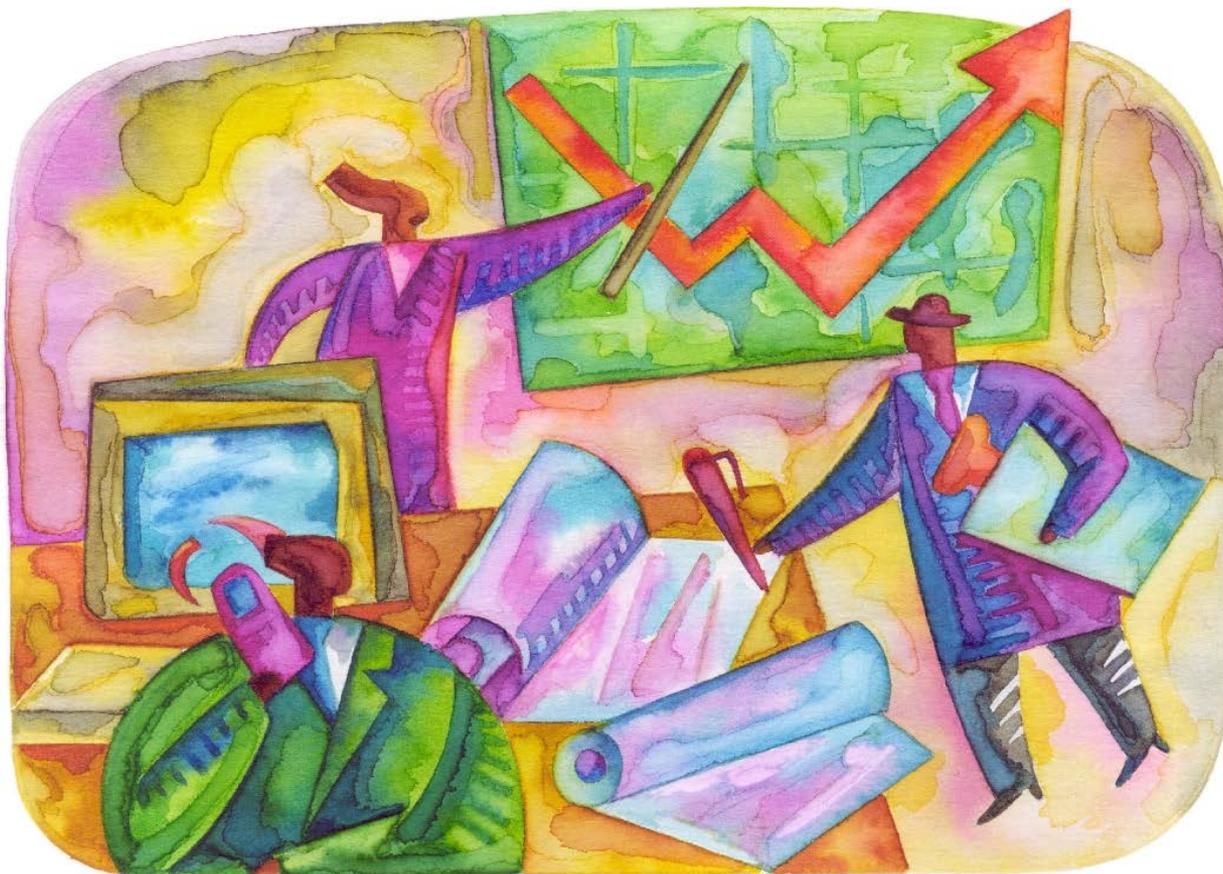


- OK, but the colors will fool you
- Easy to use
- Inflexible
- Designed for overhead projection

# Adobe Illustrator or InDesign



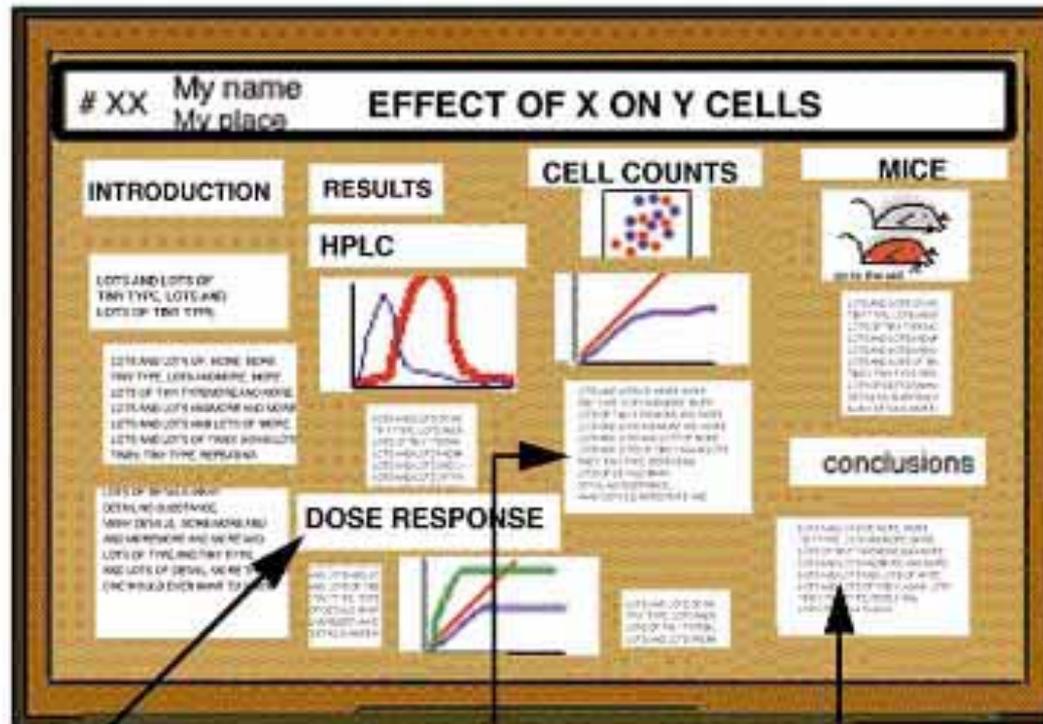
- Excellent
- More difficult to learn
- What you see is what you get
- Others: Canvas, Publish-It, Corel Draw, LaTeX, etc.



Let's design a poster!



## The Secrets of Readable Text:



Large type states methods, not results

Results artfully buried in a methods description

Carefully omits interpretations

Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here  
Address Goes Here, Address Goes Here



**Introduction**

File .

Check all content against the specific requirements of the journal, including the journal's style guide.

The purpose of the journal is to provide a forum for the publication of research results in the field of materials research.

Check the journal's website for the most up-to-date information on the journal's requirements.

**Aim**

The aim of the journal is to provide a forum for the publication of research results in the field of materials research.

The journal's website provides information on the journal's requirements.

**Method**

The method used in this study was a combination of experimental and computational techniques.

The results of the study are discussed in the following sections.

Figure 1: A line graph showing the relationship between X and Y. The X-axis ranges from 0 to 10, and the Y-axis ranges from 0 to 100. The data points are approximately (1, 10), (2, 20), (3, 30), (4, 40), (5, 50), (6, 60), (7, 70), (8, 80), (9, 90), and (10, 100).

**Results**

The results of the study are presented in the following sections.

The first section discusses the experimental results, and the second section discusses the computational results.

Figure 2: A line graph showing the relationship between X and Y. The X-axis ranges from 0 to 10, and the Y-axis ranges from 0 to 100. The data points are approximately (1, 10), (2, 20), (3, 30), (4, 40), (5, 50), (6, 60), (7, 70), (8, 80), (9, 90), and (10, 100).

**Conclusion**

The conclusion of the study is that the combination of experimental and computational techniques provides a comprehensive understanding of the materials research.

**References**

The following references were used in this study:

1. Smith, J. (2010). Materials Research. Journal of Materials Research, 22(1), 1-10.

2. Jones, K. (2011). Materials Research. Journal of Materials Research, 23(2), 1-10.

**Acknowledgments**

The authors would like to thank the following individuals for their contributions to this study:

1. Dr. John Doe

2. Dr. Jane Smith

- Leave breathing space around your text
  - Plain fonts even serif here
  - Same size and style
  - Left-aligned
- The reason is...



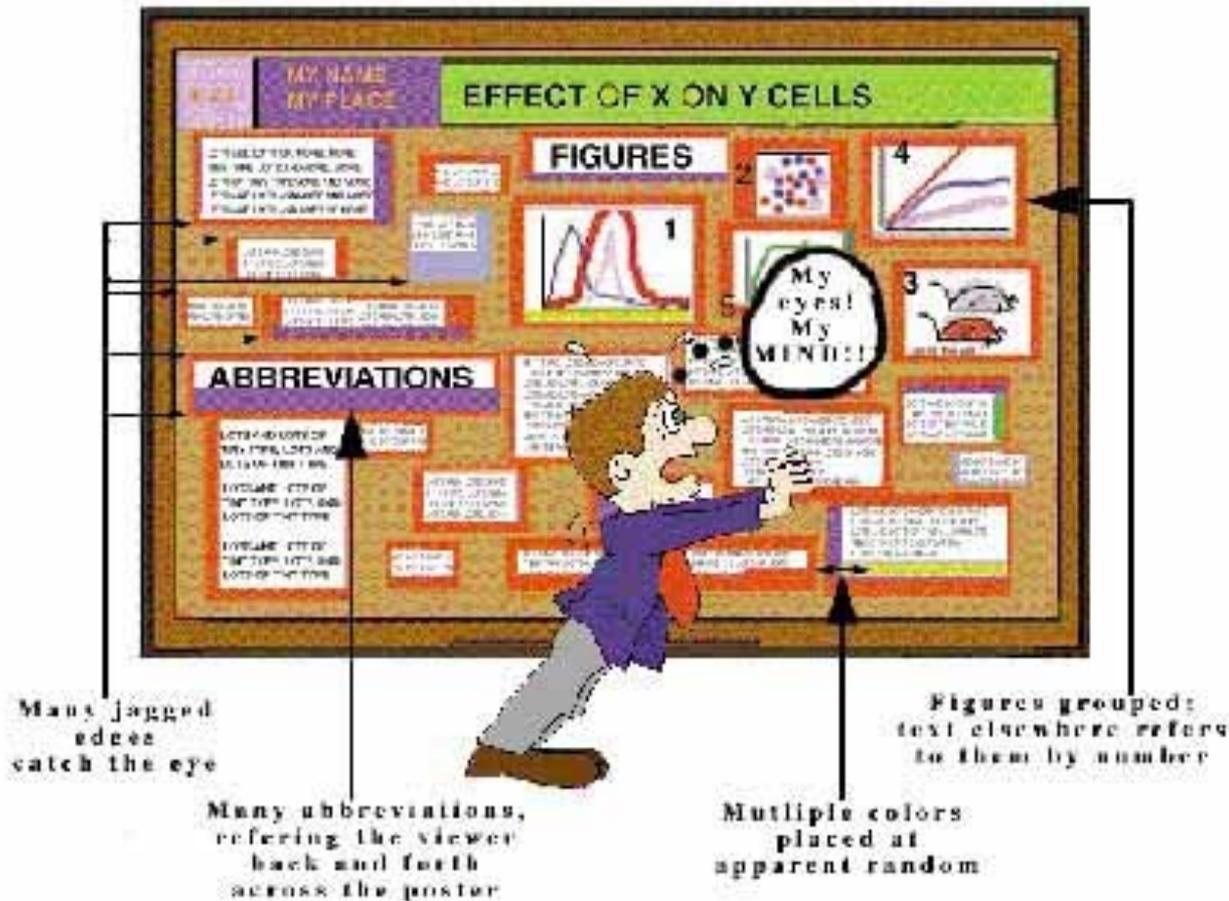
Hi there, my name is mitch collinsworth and I would like to tell you about myself and how I got this job at cornell. Well you see, my uncle had a friend who knew my cousin on the other side and his daughter worked for facilities. I was down on my luck and my sister told me she knew a guy who's nephew's wife's kid worked for this guys father and what can I say , he hired



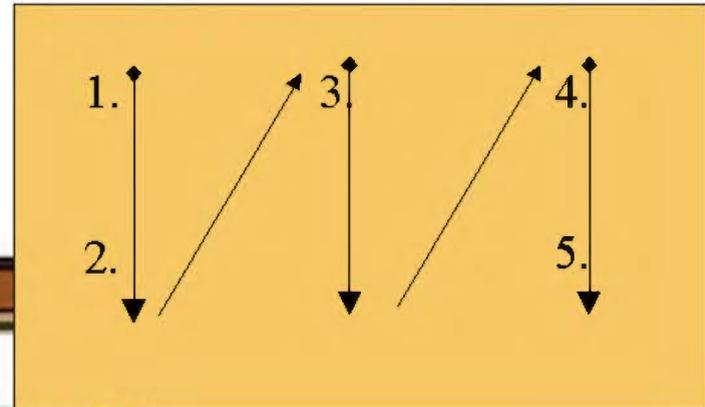
Hi there, my name is mitch collinsworth and I would like to tell you about myself and how I got this job at cornell. Well you see, my uncle had a friend who knew my cousin on the other side and his daughter worked for facilities. I was down on my luck and my sister told me she knew a guy who's nephew's wife's kid worked for this guys father and what can I say, he hired me with no questions asked and just told me to keep my mouth shut. So here I am at CCMR.



## Easy for the eye to follow



Utter chaos  
will make  
folks dizzy!



# XX My name  
My place substance X induces Y-cells

**Context:**  
Y-cell require induction  
substance X may be  
the inducer because  
we know virtually  
nothing about X,  
but we had some  
on the shelf.

**1**  
lots and lots  
lots of tiny  
and lots of  
more detail  
tiny type is



tiny type, lot of type  
tiny, tiny type, lots and  
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at more details.

**2**  
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**4**  
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and lots  
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pe. Lots of type.

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tiny type and me  
tiny tiny tiny

**1**

**2**

**4**

**6**







# Keep posters visual!



## Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Goswin and Russell Boeski  
*Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695*



### Introduction

Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

### Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD) and if growth is affected by rearing temperature.

### Methods

- Southern flounder blood and urine were assayed to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were reared from a natural diet on filter-sterilized to high protein pelleted food and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm the juvenile flounder were stocked at equal densities into one of three temperatures (18, 23, or 28°C for 245 days).
- Crustaceans were preserved and later sexed at 2-6 months.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

### Histological Analysis

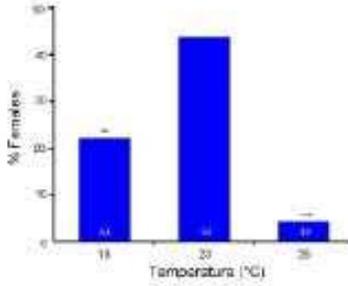


Male Differentiation



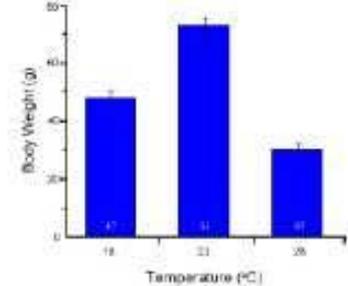
Female Differentiation

### Temperature Affects Sex Determination

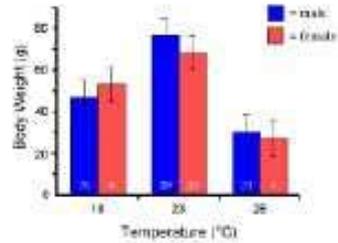


\*\*\*P < 0.001 and \*\*P < 0.01 represent significant deviations from a 1:1 male:female sex ratio.

### Rearing Temperature Affects Growth



### Growth Does Not Differ by Sex



### Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperatures produced 8% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperatures produced 44% females.
- Fish reared at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no difference in growth existed between sexes.

### Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 to 1-year southern flounder.

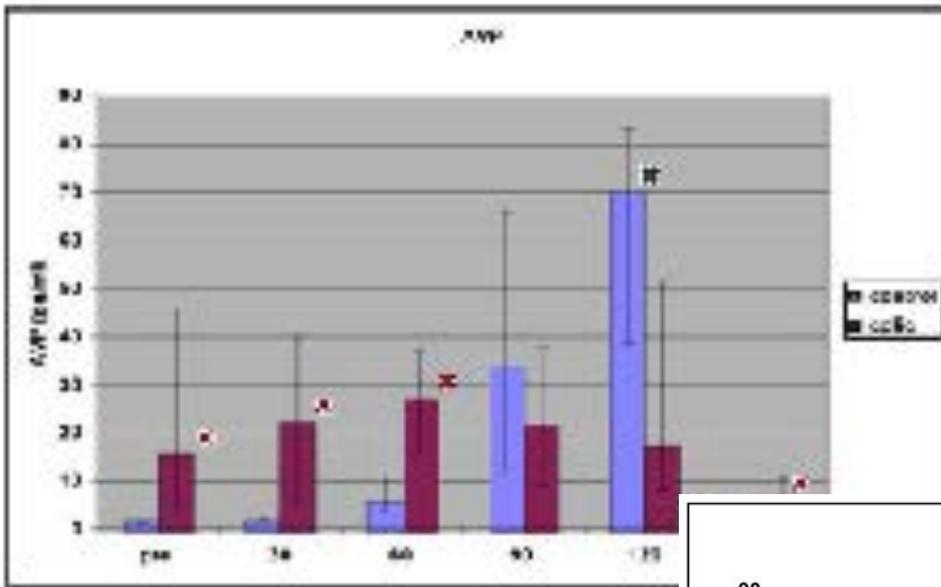
### Acknowledgements

The authors acknowledge the following Graduate Program of the National Marine Fisheries Service at the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Les Wilson and Beth Strawn for help with the work.

## Picture perfect photos

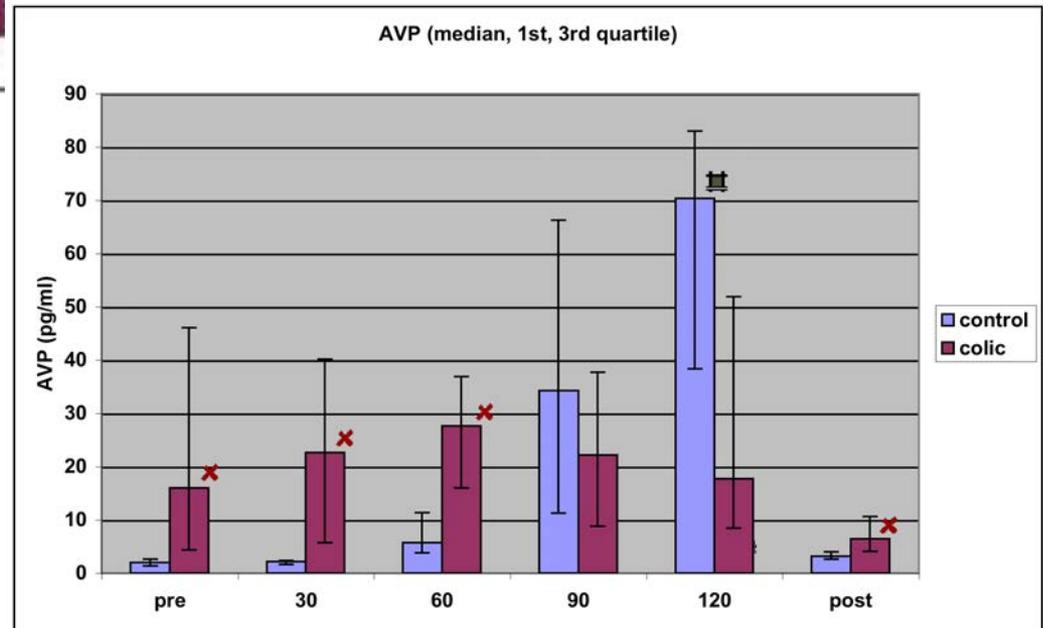
- Avoid resolution overkill!  
At least 150 dpi, but no more than 300 dpi
- Save photos as jpg or png  
Line art as a png (graphs)
- Web images are usually  
poor resolution

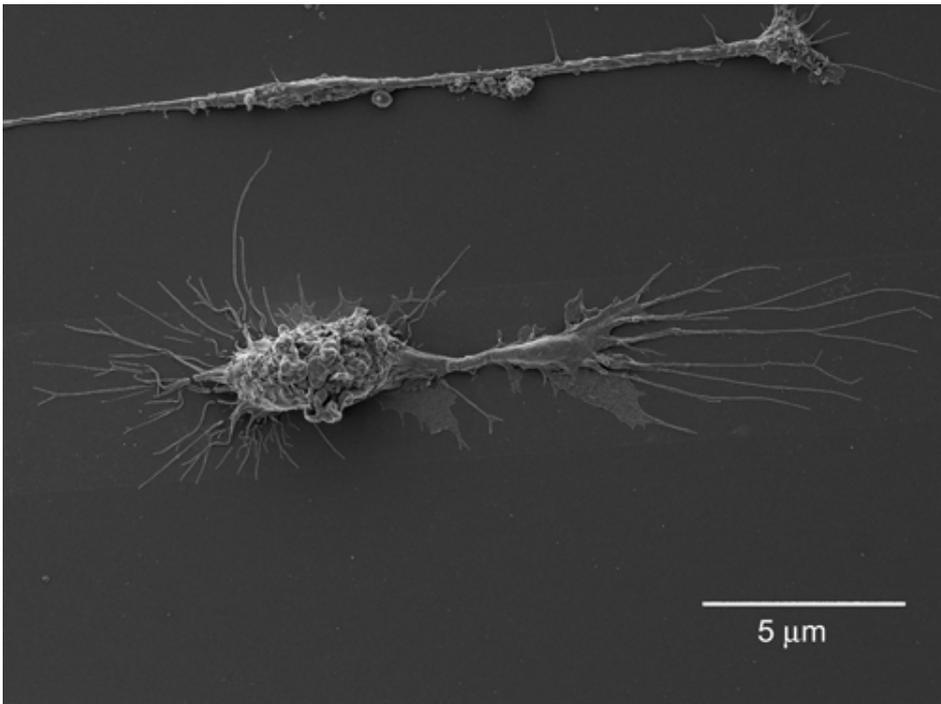




jpg

png

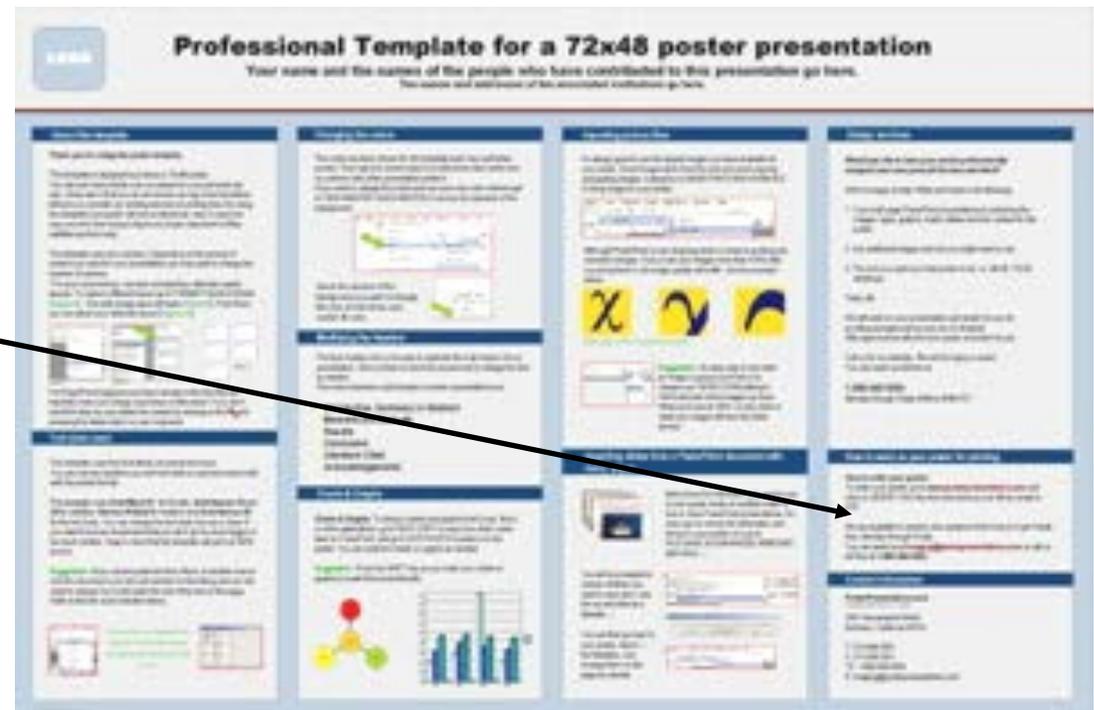




Your cool images  
mean nothing  
without a  
scale bar or  
description

# Don't forget your funding acknowledgements

CNF-NSF-BMR, etc  
Your department can provide you with the required wording



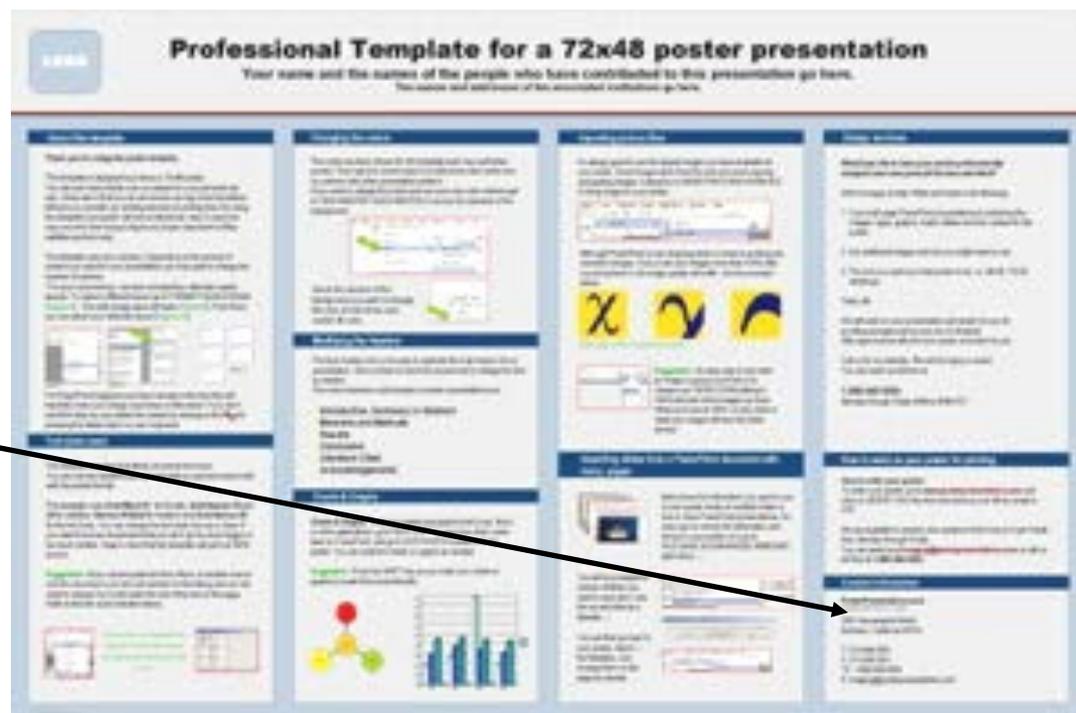
# Your contact info!!!

Without it you' ll become

*“ya know, those guys with the awesome poster”*

Include all  
contact info:

- Mail address
- Phone
- E-mail



# Using color to engage your readers

2-3 colors, no more!

Dark type on  
light color background

**Poster title goes here, containing strictly only the essential number of words...**

**Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here**  
**Address/es Goes Here, Address/es Goes Here, Address/es Goes Here**

**Introduction**  
Plot ...  
Check with conference organizers on their specifications of abstract placement before you submit your poster. If you have a poster abstract, please provide your abstract.

This poster is for poster template A (84" x 110"), landscape (portrait) format. Do not change the page size. You can scale to a smaller or larger size when printing. You need a different poster template if you are printing vertically or a smaller poster template.

Be sure to include your contact information and a small photograph or image of your poster template (e.g. 100 x 100 pixels). Do not make your poster bigger than necessary to fit on the wall.

**Aim**  
How does this poster template ...  
Simply highlight the essential aspects of your work in your abstract or copy and paste your abstract into the provided space. The copy and paste should be between 2 and 12 pages. A 12" x 18" or 18" x 24" size. Keep your text aligned to the right. Do not justify text. The color of the text on your poster background can be changed to the color of your choice.

**Method**  
Tips for making a successful poster ...  
• Rewrite your paper in poster format. Simply everything and save a draft.  
• Headings of more than 6 words should be both upper and lower case with all capitals.  
• Use a word processing program in capital or small caps for all characters in bold.  
• When laying out your poster, leave enough space around your text. Don't overcrowd your poster.  
• Try using photographs or colored graphs. Avoid long numerical tables.  
• Spell check and grammar check your program.

**Results**  
Importing the image files ...  
Images such as photographs, graphs, diagrams, logos, or art can be added to the poster.  
To import an image, highlight your poster, go through the menu and click on Insert > Picture From File. In the box on your computer, select the image you want. The format of the image file is important. JPEG or TIFF, JPEG is the preferred format.  
Be aware of the image size you are importing. The average color photo (13" x 18" or 18" x 24") would be about 3MB. (Megabyte) in size. Call the University of Minnesota. Do not use images from the web.

How do you graphs ...  
For all graphs use MS Excel or other graphing software in Power Point.  
Graphs can be made using graphing programs (e.g. Sigma Plot, Plot, or SPSS). Graphs can be saved as JPEG or TIFF if possible. For more information see the University of Minnesota website.

**Conclusion**  
For more information on Poster Design, Scanning and Digital Photography, and Image Files:  
Contact:  
Medical Illustration Unit  
Phone: 555-5555  
Email: info@med.illustration.edu  
Website: www.med.illustration.edu

**Acknowledgements**  
Justify highlight the essential aspects of your work. Right-align with your text.

# Whoa! Where's my sunglasses?

**POSTER TITLE GOES HERE, CONTAINING STRICTLY ONLY THE ESSENTIAL NUMBER OF WORDS...**

**Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here**  
**Address/es Goes Here, Address/es Goes Here, Address/es Goes Here**

### Introduction

First ...

Check with conference organizers on their specifications of size and orientation before you design your poster. Medium poster size is 36" x 60" (portrait) or 48" x 36" (landscape).

The paper size of the poster template is A0 (36" x 60") landscape (horizontal) format. Do not change the page size. You can scale it to a smaller or larger size when printing. You need a different setup size with either a portrait (vertical) or a square poster template.

Be sure that you do not miss the upper left-hand corner of the poster. Conference organizers (e.g., Swinburne) do not make your poster bigger than necessary, but will charge you.

Check with conference organizers on their specifications of size and orientation before you design your poster. Medium poster size is 36" x 60" (portrait) or 48" x 36" (landscape).

The paper size of the poster template is A0.

### Method

Tip for making a successful poster ...

- Rewrite your paper in poster format. Simply everything and state overall.
- Headings other than Section should be both upper and lower case, small capitals.
- Leave a wide margin in capitals or underlines. Press your paper size bold characters (bold).
- When laying out your poster leave plenty of space around you text. Don't overcrowd your poster.
- Try using photographs or colour graphs. Avoid long numerical tables.
- Spell check and grammar check before proofread.

Copyright © 2004 by Thomas Thurner. Printed in Singapore. Size: 36" x 60" (portrait) or 48" x 36" (landscape). All rights reserved. This document is available in PDF format. Contact us for more information on our website.

### Results

Printing (formatting) ...

Images such as photographs, graphs, diagrams, logos, etc. can be added to the poster.

To save space on the poster, go through the menu as follows: Insert > Picture > From File > From your computer, select a good one. The background image will be shown in JPEG or TIFF, JPEG is the preferred format.

Be aware of the image size you are importing. The size of your photo (36" x 60") will be about 1000 x 1500 pixels (width/height). Call the University. Do not use images from the web.

Use color graphics ...

For simple graphics use MS Excel or another graphing tool in Power Point.

Graphs with a scientific graphing program (e.g., Sigma Plot, Origin, etc.) should be saved as JPEG or TIFF if possible. For more information see the University.

Copyright © 2004 by Thomas Thurner. Printed in Singapore. Size: 36" x 60" (portrait) or 48" x 36" (landscape). All rights reserved. This document is available in PDF format. Contact us for more information on our website.

### Printing and Lamination

Once you have completed your poster, bring it to the University for printing. We will provide a size of poster you choose and provide. The final poster will be printed and laminated.

Keep a copy of your poster until the committee. Allow at least 2 weeks for the poster to be printed. Please contact the University for more information.

Cost ...

For poster printing and lamination charges contact the University.

### Conclusion

For more information on Poster Design (Printing and Digital Photography, and Image Files):

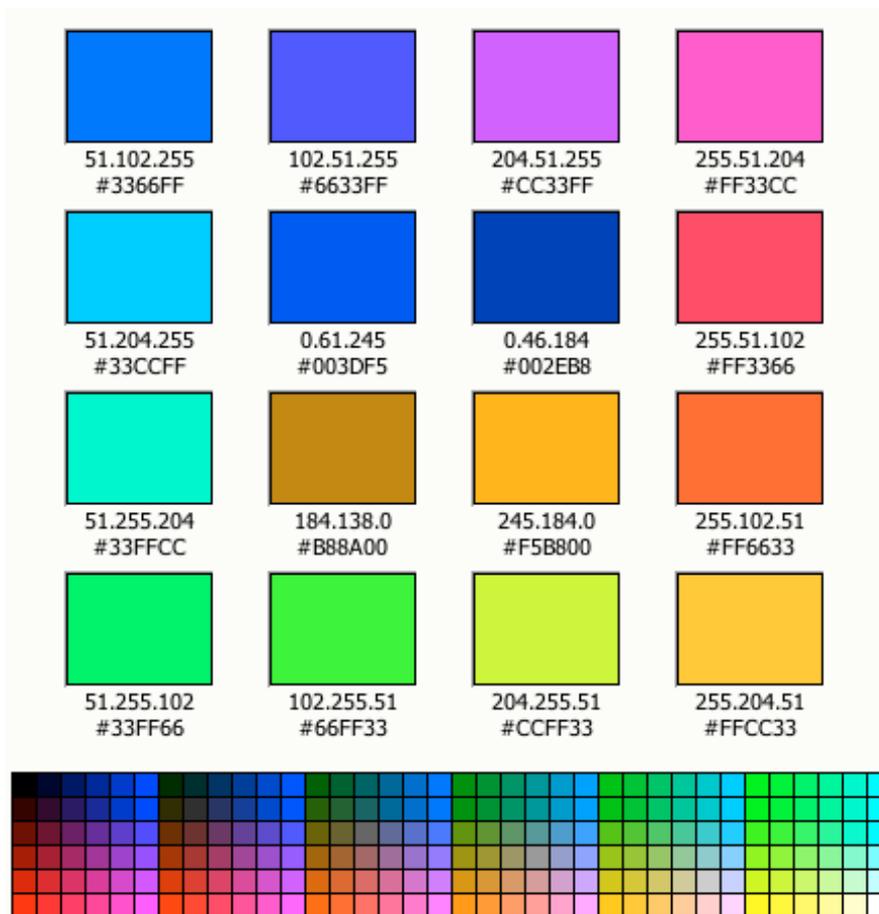
Contact:  
Medical Illustration Unit  
Princess Alexandra Hospital  
PO Box 28200  
Email: [PAHaw@pa.hq.vic.gov.au](mailto:PAHaw@pa.hq.vic.gov.au)  
Website: <http://med.illustr.vic.gov.au>

### Acknowledgements

Just the University logo and replace with your own text. Replace it with your text.

This attracts attention but tires out the eye

## Be careful with the primary colors





Blue on Red appears blurry to the human eye.

Yellow on white is hard to read

Red on Blue appears blurry to the human eye.



## • aeiko



## • Peach Green & Seeds



## • Rust



## • dollar



<http://www.colorschemer.com/online.html>

# Be aware of busy backgrounds

NC STATE UNIVERSITY

## Snook Growth in Habitats with Differing Abiotic Variability

Alesia Read, North Carolina State University, [anread@unity.ncsu.edu](mailto:anread@unity.ncsu.edu)

### PROPOSED OBJECTIVE

To create a useful tool for assessing potential stocking habitats based on degree of variability in water quality.

- Snook are a popular game fish found in the estuarine creeks of Florida
- Snook population has been on the decline due to overfishing and habitat degradation
- Numerous stock enhancement endeavors are currently underway without sufficient preliminary research
- Abiotic variability is a prominent feature of these estuaries
- Temperature, dissolved oxygen and salinity might play influential roles in the survivorship of the juvenile snook

### RESULTS

#### STUDY SITES

#### North Creek Lower (High Variability)

Negative Growth:  
Dissolved Oxygen (mg/L) 0-22  
Salinity (ppt) 2-21  
Temp (°C) 25-34

#### North Creek Middle (Medium Variability)

Positive Growth:  
Dissolved Oxygen (mg/L) 0-8  
Salinity (ppt) 16-28  
Temp (°C) 30-38

#### North Creek Upper (Low Variability)

Slow Growth:  
Dissolved Oxygen (mg/L) 0-4  
Salinity (ppt) 16-30  
Temp (°C) 26-33

### METHODS

1. Juvenile snook are raised to fingerlings (100-200 mm) in the aquaculture facility
2. All snook are tagged with identifying markers for individual growth measurements.
3. Fish are placed in cages within variable habitats at the research sites for 40 days.
4. Fish are weighed and measured for growth

### CONCLUSION

- Snook exhibit increased growth in habitats with a medium degree of abiotic variability
- Stock enhancement projects will be more efficient by releasing juvenile snook primarily in nursery habitats with a medium degree of abiotic variability

NSF Grant #1055100



### Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Godwin and Russell Boeski  
 Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695



#### Introduction

Southern flounder (*Paralichthys lethostigma*) support variable behavior and show great plasticity for aquaculture. Female flounder are known to grow larger and reach larger adult sizes than males. Therefore, information on sex determination may help increase the ratio of female flounder in aquaculture.

#### Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

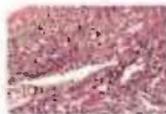
#### Methods

- Southern flounder broodstock were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Fertilized larvae were reared from a standard diet on filters at rearing temperatures of high (28°C), mid-range (23°C), and low (18°C) in a flow-through system.
- Upon reaching a mean total length of 40 mm the juvenile flounder were stocked at equal densities into one of three temperatures (18, 23, or 28°C) for 245 days.
- Growth was observed and fish sacrificed at 245 days.
- Sex-distinguishing markers were used to distinguish males (gonatropogenesis) from females (gonadogenesis).

#### Histological Analysis

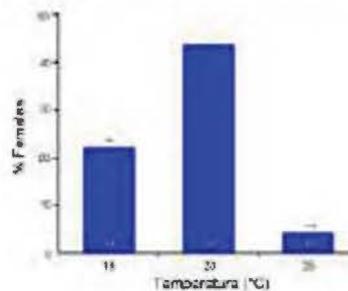


Male Differentiation



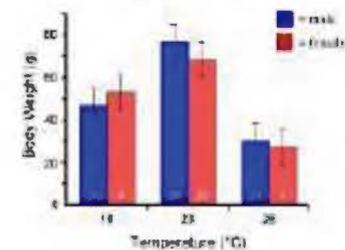
Female Differentiation

#### Temperature Affects Sex Determination



\*\*\*P < 0.001 and \*\*\*\*P < 0.0001 represent significant differences from a 1:1 male:female sex ratio.

#### Growth Does Not Differ by Sex



#### Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperatures produced 8% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish reared at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days post-differences in growth existed between sexes.

#### Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 to 1 year southern flounder.

#### Acknowledgements

The authors acknowledge the following Keynote Program of the National Institute of Health through the University of North Carolina Sea Grant College Program and under the National Science Foundation Grant #1055100 for support of this work.

# A little different!

NC STATE UNIVERSITY

## Southern Flounder Exhibit Temperature-Dependent Sex Determination



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### Introduction

Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

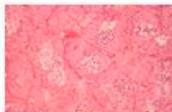
### Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD), and if growth is affected by rearing temperature.

### Methods

- Southern flounder *larvae* were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were weaned from a natural diet (*zooplankton*) to high protein *pellets* and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal densities into one of three temperatures 18, 23, or 28°C for 245 days.
- Gonads were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (*oogenesis*).

### Histological Analysis

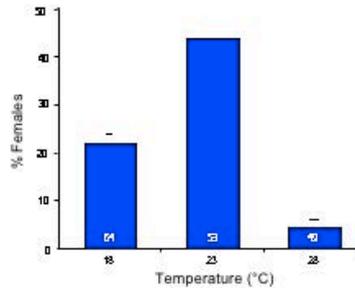


Male Gonad section



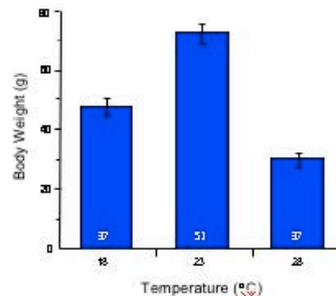
Female Gonad section

### Temperature Affects Sex Determination

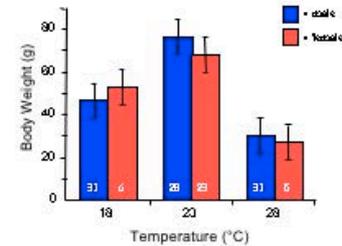


(\*\*P < 0.01 and \*\*\*P < 0.001 represent significant deviations from a 1:1 male:female sex ratio)

### Rearing Temperature Affects Growth



### Growth Does Not Differ by Sex



### Results

- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperature produced 4% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

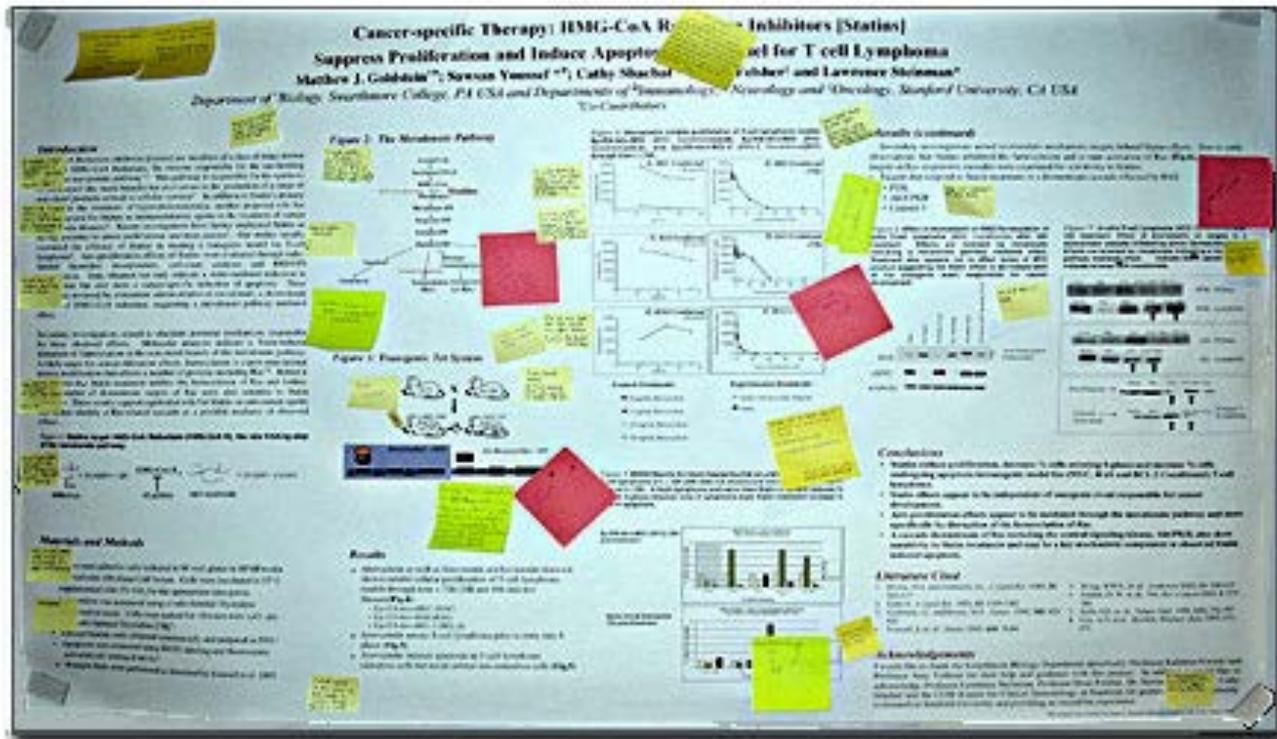
### Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

### Acknowledgements

The authors acknowledge the support of funding from the National Science Foundation and the University of North Carolina at Chapel Hill. Funding for this research was provided by the NSF Grant #1008000 and the University of North Carolina at Chapel Hill.

# Edit, Edit, Edit and Evaluate!



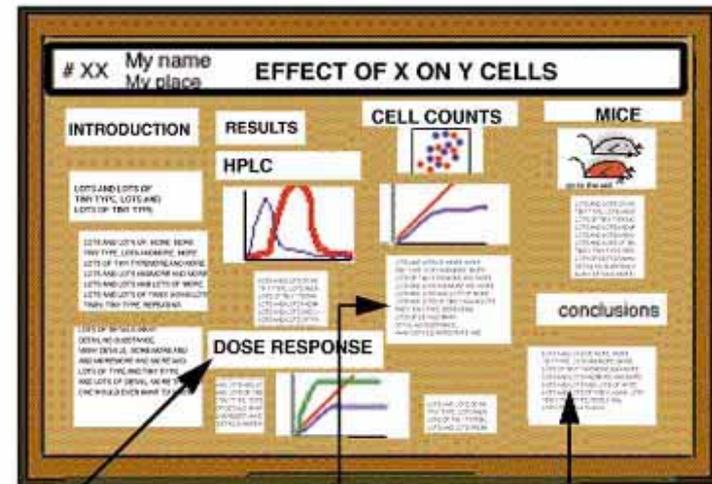
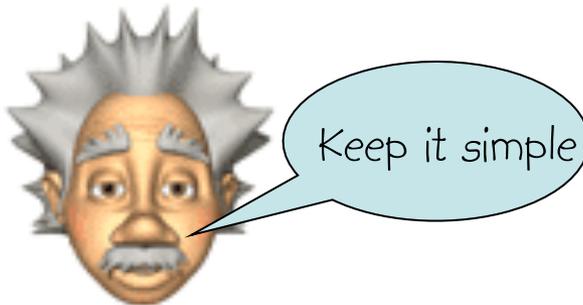
## Print out a letter size draft

Can you read the type?

Are these the colors you really want?

Does it look too busy?

Do my main points pop?



Large type states methods, not results

Results artfully buried in a methods description

Carefully omits interpretations

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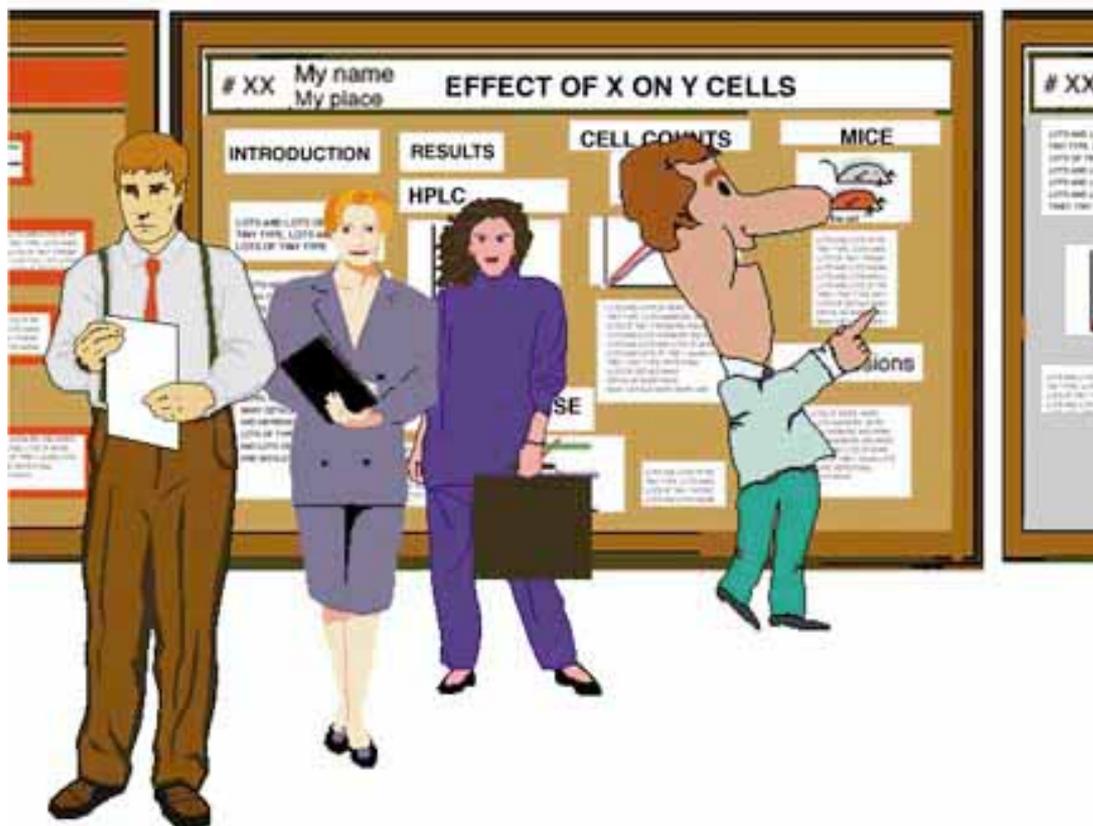
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“Ugly design print ugly poster”

[http://cf.ccmr.cornell.edu/cf\\_newsite/poster\\_print/index.html](http://cf.ccmr.cornell.edu/cf_newsite/poster_print/index.html)

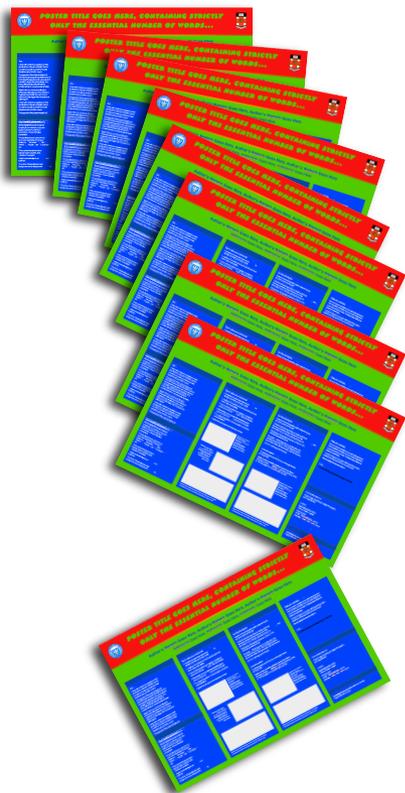
# You're not done yet...

Prepare a 3-5 minute verbal explanation

Is he ever  
going to  
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- Provides a written record for interested folks
- Makes you look together
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and see what you've learned

## Using a Windbreak Habitat Model Across Broad Landscapes: The Effect of Local Landscape Composition and Geographic Location

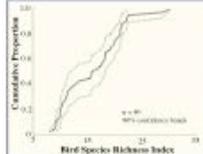
George Hess<sup>1</sup>, John Poulsen<sup>2</sup>, Raymond O'Connor<sup>3</sup>, Jeff Bay<sup>3</sup>

### 1. Windbreaks as Habitat

Agricultural lands — fields, pastures, and orchards — are managed to produce food and fiber for people. In the U.S., Great Plains, an extensive agricultural landscape, windbreaks have been planted to protect fields, crops, livestock, and livestock from the prevailing wind. Windbreaks provide some of the finest wooded habitat for birds and other wildlife that people have come to value. Windbreaks make up about 25% of the wooded cover in Nebraska, much of the other wooded cover across the Great Plains.

Although they provide cover from wind erosion and provide habitat for some species, windbreaks also contribute to the fragmentation of prairie grasslands. Prairie fragmentation negatively impacts prairie wildlife such as prairie prairie chickens, upland sandpeeps, and prairie warblers.

- Forty windbreaks were sampled using message sampling with a frame stratified by intensity of cultivation.
- Most sample windbreaks fall in or near extensive cropland.
- Habitat characteristics of each windbreak were measured in 1991.
- Thirty-five farmers allowed researchers to return in 1992.



- Using regression factors associated with each sample, we estimated the habitat value of windbreaks for the region (graph left).
- We estimated that half of Nebraska's windbreaks support fewer than 10 breeding bird species (graph left).
- We also estimated that between 67% and 100% of windbreaks are smaller than 1.2 hectares (data not shown), suggesting that few Nebraska windbreaks provide habitat for forest interior or area sensitive birds.

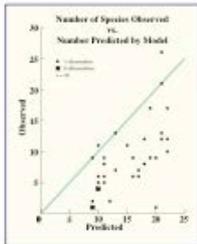


### 4. Validating BSRI Model

In 1992, a team of five ornithologists revisited 39 of the 40 windbreaks (1 farmer refused further visits) between late May and early July.

Each windbreak was visited four times. Data were collected between one half hour before and one hour after sunrise. All observed birds were identified by species and recorded using spot mapping techniques. Two recorded observations of the same species were only placed on the field map through the windbreak for each visit.

Because the windbreaks were narrow, we assumed all species were detected.



### 5. Results of Validation

The model overestimates the number of bird species in the Nebraska windbreaks (graph left). However, the relative qualitative ranking of windbreaks is generally preserved. A total of 31 species were observed.

A strong, significant relationship was found between deviation of observed from predicted number of species and size, relative width of the geographic location of individual windbreaks.

Forest interior, area sensitive, and forest edge species occurred in the larger, taller, more complex windbreaks.

Openland and grassland species occurred in the smaller, shorter, less complex windbreaks.

### 6. Failure of the Model

There are several possible explanations for the failure of the model to predict accurately the number of bird species in the windbreaks.

- 1) **Geographic differences in species richness.** The model was developed in Kansas, which has 5-20 more species of bird than Nebraska. Breeding Bird Survey species richness map of North America.
- 2) **Differences in adjacent windbreak characteristics.** The number of species in Nebraska's windbreaks depends differently on windbreak characteristics than did the number of species in Kansas.
- 3) **Differences in landscape-scale characteristics.** The number of species in Nebraska's windbreaks depends on characteristics of the surrounding landscape.

### 7. Local Landscape-Scale Effects

Land cover data were collected for the quarter-section (360 acres), which contains the sample windbreak. Cover categories were 100% cropland, crop, grass/brushland, forest, open, pasture, and water. Fences and utility poles were also recorded (present/absent).

Landscape metrics computed included relative cover distributions, total edge length, edge:area ratio, number of patches, mean patch size, mean perimeter per patch, and size of largest field.

The relation between observed and predicted number of species was not significantly related to any of the landscape metrics. This suggests that neither a region, the center of species using a windbreak depends primarily on landscape attributes.

### 8. Conclusions

- 1) The Bird Species Richness Index for windbreaks cannot be extended simply to describe species richness at large regional scales without either validating explicitly or adding terms that account for differences in regional species pools.
- 2) Local landscape-scale composition and structure do not explain the failure of the model.
- 3) The presence of species pools in windbreaks (i.e., forest interior, grassland) may be explained by windbreak size and complexity. The model may be more useful for predicting the presence or absence of species pools than for predicting the total number of species present.

**Acknowledgments:** This work could not have been done without the many dedicated people at the National Agricultural Statistics Service who helped plan and execute the 1994 data collection effort; the kind farmers who allowed us to survey their windbreaks; the five ornithologists who spent six weeks traveling around Nebraska; and many other people from the University of Nebraska, U.S. Fish and Wildlife Service, Natural Resources Conservation Service, and the Environmental Protection Agency. Funding was provided by the Environmental Protection Agency and the USDA Agricultural Research Service.

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A bit text heavy but not too bad.



## Determining the Wear Resistance of Occlusal Splints in a Prospective Clinical Study

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Dept. of Prosthodontics, School of Dentistry (Director: Prof. Dr. H.-Ch. Lauer), ZZMK (Carolfarm), J. W. Goethe University, Frankfurt, Germany

### Objective

- To determine quantitatively the wear resistance of a newly developed light-curing splint resin over a period in situ of six months.

### Materials and Methods

#### Patients

n = 20 consecutive patients  
(mean age: 34.7 years; 12 F, 8 M)

#### Inclusion criteria

- Natural dentition/ fixed denture
  - Complete dentition to at least the 1st molar and
- for the **stabilization splint sample**:
- Insufficient occlusal support
  - Increased occlusal loss of dental hard tissue

#### for the **distraction splint sample**:

- TMJ pain and
- Complete anterior dislocation of the disk without reduction with terminal reduction
- TMJ osteoarthritis



Fig. 1: Stabilization splint in situ

#### Resin splint material (Fig. 1)

- Light-curing (400-500 nm) resin made of high-molecular dimethacrylates with organic and inorganic fillers
- Does not contain methyl methacrylate

#### Study design

- Duration: 6 months
- Types of splints (maxilla, n = 10 each): stabilization splints, distraction splints
- Splint wear mode: 24 hours
- Examinations: before insertion (BI), at 4 weeks (4W), at 3 months (3M), at 6 months (6M)
- Occlusal adjustments were restricted to the time before 4W.

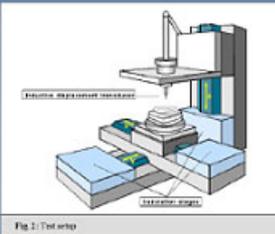


Fig. 2: Test setup

#### Measuring technology (Fig. 2)

- Vibration-isolated table framework
- 3 translation stages (for directions x, y, and z) (DC-Motor) (PI, Waldbronn)
- DV 4 stereomicroscope (Zeiss, Oberkochen)
- WA 20 inductive displacement transducer/ Spider8 digital 8-channel measurement unit/ Calman 32 software V2.1 (HBM, Darmstadt)
- Local coordinate storage for occlusal contacts during baseline measurements
- Ten measurements each in regions 13, 23, 16, 26 (BI, 4W, 3M, 6M)
- Splint repositioned on remount cast

### Results

- The medians of the occlusal vertical gaps/losses (wear, resin lamination, water sorption, etc.) are shown in Fig. 3 (stabilization splints) and Fig. 4 (distraction splints).

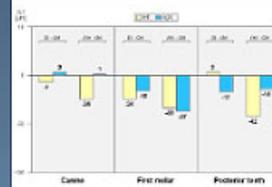


Fig. 3: Occlusal vertical gaps/losses (median) of the teeth in situ over a period in situ of six months (n = 10 stabilization splints)

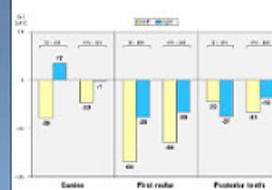


Fig. 4: Occlusal vertical gaps/losses (median) of the teeth in situ over a period in situ of six months (n = 10 distraction splints)

- Statistical analysis (Mann-Whitney U-test,  $p \leq 0.05$ ) showed no significant differences when comparing the corresponding results of stabilization and distraction splints.

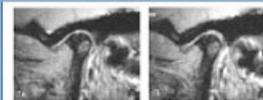


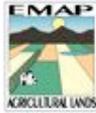
Fig. 5a and b: Sagittal oblique (SO) of the condyle (two-sided oblique without splint (Fig. 5a) and with distraction splint inserted (Fig. 5b) following six months of wearing.

### Conclusions

- The present study *clinically* confirms the good wear resistance results of the new resin splint material obtained in a previous *in-vitro* study [OTTL et al., Dtsch Zahnärztl Z 52, 342 (1997)].
- Good wear resistance is of great importance for maintaining the therapeutic mandibular position during the treatment period (Figs. 5a and b).



Nice poster



### A Framework for Assessing the Condition of Agricultural Lands

George Hess<sup>1</sup>, Anne Hielkamp<sup>2</sup>, Mike Munster<sup>3</sup>, Steve Peck<sup>3</sup>, Lee Campbell<sup>4</sup>, Betty McQuaid<sup>4</sup>, Steve Shafer<sup>3,5</sup>

**Mission:** To develop indicators of the condition of agricultural lands within an ecological framework, and to monitor and evaluate this condition on a regional basis.



**Sustainable agriculture** has been discussed, defined, and discussed in countless papers.

Definitions tend to be broad and encompass ecological, economic, social and even policy dimensions. Although these dimensions are interrelated, each may be treated independently.

In our efforts, we sought methods to examine only the ecological aspect of sustainability.



**People place values** on agricultural lands that must be addressed if monitoring is to be relevant.

**The foremost goal for agricultural lands is to produce food and fiber for human uses.**

Other desired outcomes can be considered goals for the larger landscape and sometimes function as constraints on production. These include clean air and water, wildlife habitat, and aesthetically pleasing landscapes.

**The ecological condition** of agricultural land is defined by its productivity and the degree to which natural biotic and abiotic resources are conserved and protected.

**Agricultural land in good condition is productive and shows not comparable natural resources. Sustainability is the ability to maintain good condition over time.**



**Indicators were selected to reflect crop productivity and land stewardship.**

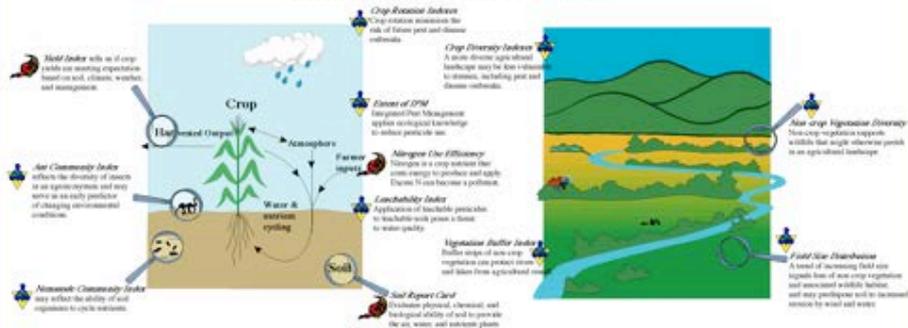
In making an assessment, condition is reported for each indicator. An overall condition may also be reported, but depends critically on the relative weighting of the goals for agricultural lands.

For sustainability, one can examine trends in crop productivity and stewardship practices.

#### Potential Indicators for Annually Harvested Herbaceous Cropland

As a starting point, we chose to concentrate our efforts on developing indicators for **annually harvested herbaceous cropland** — land planted with crops that are harvested every year whether the plants are annual or perennial. Common examples are corn, wheat, soybeans, alfalfa hay, and sorghum.

We also endeavored to supplement, rather than duplicate, existing efforts. Our conceptual framework is flexible enough to incorporate indicators based on data from other monitoring efforts. For example, an erosion indicator could be developed using the USDA Natural Resources Conservation Service's National Resources Inventory data.



Fields are for crops . . .

. . . but landscapes are for all of us.

**Acknowledgments:** The EMAP Agricultural Lands Inventory Group thanks the many individuals and organizations that made the effort a success. The individuals on our advisory committee, the organizations include the USDA's Agricultural Research Service, Forest Service, National Agricultural Statistics Service, and Natural Resources Conservation Service; the U.S. Environmental Protection Agency; North Carolina State University; University of Maine; Oregon State University; University of Nebraska; and, with 1 guess, the list of organizations is pretty long, too. Thanks to all!

1. North Carolina State University, Forestry Department, Raleigh NC;
2. Duke University Medical Center, Durham NC;
3. North Carolina State University, Department of Plant Pathology, Raleigh NC;
4. USDA's Natural Resources Conservation Service, Raleigh NC;
5. USDA's Agricultural Research Service, Raleigh NC.



# Where do I begin?



### PREVALENCE OF OBESITY AMONG INNER CITY LATINO CHILDREN AND ADOLESCENTS

Nazrat M. Mirza MD, ScD, Jill Merchant MS, Leslie Becker, PhD  
Children's National Medical Center and George Washington University School of Medicine and Health Sciences,  
Washington, DC

**Background**

Obesity is a multi-etiological and public health problem facing children and adolescents in the US. Of particular significance is the increasing prevalence of obesity and its complications among the Latino population. Addressing this public health problem in a strong sense of family and children as a priority. Studies of the problem placed on children. They may be a neglected population that should be served not by dental food or other services made at TV. Obesity in children and adolescents is concerning not only because of the associated health and psychosocial consequences, but also because obese children tend to become obese adults. Thus, obesity is associated with long chronic diseases, it will have an economic impact on the health care system.

**Purpose of Study:** Examine the extent of obesity among inner city Latino children and adolescents with the overall goal of informing the need for an obesity intervention program.

**Study Design**

Two hundred and twenty-five charts of children and adolescents aged 4 to 17 years were randomly selected from well-child visits to Children's Hospital's Latino Magnet Clinic for the calendar year 2010. The charts were an average of 8.6% (range 4 to 24%), approximately 46.9% Latino, predominantly from El Salvador. Information contained from the charts included height, weight, blood pressure. Large classification history, and physical findings consistent with obesity complications. Height (Leslie Becker, MD) was calculated from measured weight and height. Data analysis was done using SAS version 9.1.

**Results**

The distribution of the study sample is shown in Table 1. About 50% were female. The average age was 10.4 years with a SD of 3.3 and a range of 4.0 to 17.7 years. The mean BMI was 20.8 with a SD of 3.4 and a range of 13.1 to 31.6. Overall 40% of the children and youth were overweight (BMI ≥ 25) percentiles or at risk for overweight (BMI < 100<sup>th</sup> percentile) with an almost equal distribution between the two categories (Table 2). Males were more overweight and at risk for overweight than females, but the gender difference was not statistically significant. The prevalence of overweight was highest for youth ages 10 to 17 years.

**Table 1 - Population statistics**

Variable	Frequency (%)
Gender	
Male	66.1
Female	33.9
Age Categories (years)	
4-6	19 (12)
7-8	40
9-10	22.4
11-12	27.8
13-14	14.4
15-16	10.8
17-18	8.2

**Results continued**

Table 3 shows the distribution of overweight and at risk for overweight by age category. There did show that prevalence overweight and at risk for overweight is high in children as young as 4 to 6 years. Although the prevalence of overweight and at risk for overweight was lower in the age group 14-17 years, the difference was not statistically significant. Patient from help (18.4 and 20.0%) respectively).

Latino frequency was higher among the overweight than the non-overweight children and youth (50.0% vs. 46.9% respectively). There was no difference in the frequency of occurrence of other signs such as, hypertension, sleep apnea, breathing difficulties, behavior and problems, osteoporosis, and ADHD between the overweight and non-overweight group. Only 7% of all the overweight children had their cholesterol levels checked. The cholesterol levels ranged from 112-230 mg/dL. The percent of the children and their serum triglyceride ranged, and the range was 17.1-77 mg/dL. There was no significant association between overweight and percent of children blood pressure in the normal range. Only 20% of the overweight children and youth were diagnosed and had follow-up care in their charts regarding their overweight status by their health care providers. There were no referrals for overweight intervention and follow-up care.

**Table 2 - BMI distribution**

BMI Category	Frequency (%)
At Risk for overweight (BMI 18.5-24.9)	20.8
1. Both sexes (n=125)	22.4
2. Males (n=76)	27.4
3. Females (n=49)	19.4
Overweight (BMI ≥ 25) <sup>th</sup> Percentiles	20.0
1. Both sexes (n=125)	22.4
2. Males (n=76)	18.1
3. Females (n=49)	20.0

**Table 3 - At Risk for Overweight and Overweight by Age Category**

Age Category (n)	At Risk for Overweight (%) (BMI 18.5-24.9)	Overweight (%) (BMI ≥ 25)
4-6 (n=19)	32.0	10.5
7-8 (n=40)	35.0	22.5
9-10 (n=22)	9.1	18.2
11-12 (n=28)	36.1	27.8
13-14 (n=14)	21.4	21.4
15-16 (n=11)	27.3	36.4
17-18 (n=8)	25.0	6.3

**Conclusions & Recommendations**

The prevalence rate for overweight and at risk for overweight among children and youth in the inner city Latino community is more than twice the national average. Primary health care providers need to acknowledge and assess the presence of obesity and overweight in children and adolescents to early and provide appropriate management of the problem. Targeted intervention and prevention strategies for overweight and obesity in children and adolescents are urgently needed for this population.



I'm feeling sleepy

### Early Outcomes of the First 1471 Consecutive Kyphoplasty Procedures in the United States for the Fixation of Painful Osteopenic Vertebral Body Compression Fractures (VCF)

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<sup>1</sup>University of California, San Diego, Medical Center, San Diego, CA, <sup>2</sup>Cleveland Clinic, Cleveland, OH, <sup>3</sup>Benken Orthopedic Medical Group, Berkeley, CA, <sup>4</sup>Hospital for Special Surgery, New York, NY, <sup>5</sup>University of Chicago Spine Center, Chicago, IL, <sup>6</sup>Mit-Alberta Spine Specialists, Richmond, VA, <sup>7</sup>State University of New York Health Sciences Center, Syracuse, NY, <sup>8</sup>Albany Medical Center, Albany, NY



#### BACKGROUND

- 700,000 VCFs per year
- 275,000 diagnosed, ~80% due to pain
- Spinal deformity associated with
  - Significant morbidity
  - 22% increased mortality (Kado, Ann Int Med 1996)
- Current treatments ineffective
  - Open surgeries fail
  - Medical management palliative
- Vertebroplasty
  - Bifidirectional cement fill
  - Relieves pain
  - Requires high pressure and runny cement
  - High risk of cement leaks
    - Up to 73% where documented (Hest et al., Radiology 1997)
  - Major complications (Chris, J Int Neuronal 1997)
    - 1.3% in osteoporosis
    - 10% in metastatic cancers

#### KYPHOPLASTY

Kyphoplasty is a minimally invasive orthopedic procedure for reducing and fixing painful vertebral body compression fractures secondary to osteoporosis. Using a posterior approach, one or two inflatable Bone Tamps (Fig. 1) are inserted into the fractured vertebral body, generally using a bilateral transpedicular approach (Fig. 2). The surgeon carefully inflates the balloon tamps (Fig. 2) using radiopaque contrast medium with image, volume and pressure control. The increased balloon tamp volume compacts the inner cancellous bone as it pushes the fractured outer cortical bone back toward its normal position. The inflation path is also controlled by placement, volume and balloon design. After reduction, the balloon tamp is removed, and the resulting void is filled with thick PMMA under low manual control and low pressure. The steps of Kyphoplasty are illustrated in Fig. 3.

Figure 1 Inflatable Bone Tamp (IBT)



Figure 1 Cleared in the U.S. for the reduction of fractures and/or creation of a void in cancellous bone.



Figure 2 Bilateral Transpedicular Fracture Reduction with the IBT

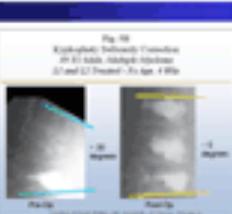
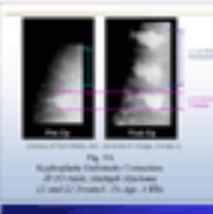
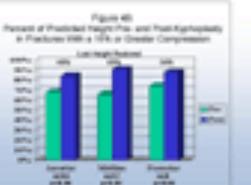
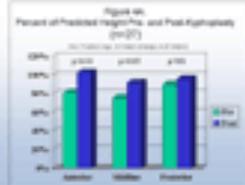
Figure 3 Kyphoplasty Using the IBT



#### STUDY DESIGN AND METHODS

A retrospective multi-center review to assess early outcomes with Kyphoplasty. Pain was localized by physical examination. The presence of mass lesions and softtissues was confirmed on MRI. General or deep local anesthesia was chosen based on anatomy, number of levels and patient status. The first 135 patients at our centers were asked to characterize their back pain as improved, the same or worse 24 hours post-op and at last follow-up. Fractured and nearest normal vertebral body heights were measured anterior, middle and posterior in the first 27 vertebral body fractures treated by one surgeon (MAM). The height of the nearest normal vertebral body was used to calculate the % of predicted height for all the vertebral bodies (Fig. 4A) and for the sub-set where which had lost 15% or more of height before treatment (Fig. 4B).

The pre-treatment height was subtracted from the predicted height, then divided by the post-treatment height subtracted from the predicted height, to find the percentage of total height restored. One set of X-rays by one surgeon (JMP) are used to show an example height restoration (Fig. 5A) and deformity correction (Fig. 5B). Device-related major complications from all procedures are reported. Fracture leaks in the first 70 procedures performed by one surgeon (JML) were assessed with X-ray and MRI.



#### PRELIMINARY RESULTS

- 107 before (level 1-7)
  - Average (range) age: 67 (46-86)
  - Range: 10 (male) / 97 (female)
- 93 operations
- 93 patients (level 1-7)
- Average vertebrae: 3.7
- Average fracture position: 10 (range: 8-17)
- Average tamp inflation volume: 1.0 cc (range: 0.7-1.6)
- Were the IBT expansion seen with:
  - MRI: 100%
  - MRI: 98% post-procedure and 100%
  - MRI: 95% reduction of fracture height (Fig. 6) (N = 10) (N = 10)
  - No increased incidence of adjacent fracture
  - 100% show no major complications
    - Avascular necrosis
    - Laminectomy
    - Hemiblock
    - Epidural
    - DVT: 0% (all with deep vein thrombosis)

#### CONCLUSIONS

Kyphoplasty is an important treatment option that provides immediate stability and return to activities of daily living to patients with acutely painful vertebral body compression fractures secondary to osteoporosis. Kyphoplasty facilitates fracture reduction and deformity correction. While reduction is more likely in acute fractures (few months or less), it has been seen in fractures over one year old. Kyphoplasty also provides rapid pain relief to the nearly all patients, and this result is independent of fracture reduction. The safety profile of Kyphoplasty compares favorably to the published safety profile of vertebroplasty.

OK, but which way do I go?



### Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here  
 Address/es Goes Here, Address/es Goes Here, Address/es Goes Here

#### Introduction

**Fit...**  
 Check with conference organizers on their specifications of board dimensions before you start your poster. If you're in a poster session, make sure you're aware of the size of the poster. The standard size is 36" (91.4 cm) wide by 72" (182.9 cm) high. If you're in a poster session, you may be able to use a smaller or larger size when printing. You may also want to check with the printer for a poster size that is different from the standard size. Be sure that you don't lose any important information when you scale the poster. If you're in the USA, don't make your poster larger than necessary to fit on the board.

#### Aim

**How to use the poster template...**  
 Simply highlight the text and replace it with your own text or copy and paste your text into MS Word or a Power Point presentation. The body text should be between 24 and 32 points. Arial, Helvetica or Calibri. Keep body text aligned, do not justify text. The color of the text on the poster background can be changed to color of your choice.

#### Method

**Tips for making a successful poster...**

- Re-write your paper in poster format. Simply everything, and save over it.
- Headings other than the words should be both upper and lower case initial capitals.
- Leave a wide margin on the left and right sides of the poster. Use bold characters for emphasis.
- When laying out your poster, leave breathing space around your text. Do not crowd your poster.
- Try using photographs or diagrams/graphs. Avoiding numerical tables.
- Spell check and get someone else to proof read.



Experiment as an in-Text Reference. If you are in a poster session, you should use the same font size as the text in the rest of the poster. Do not use a different font size for the text in the rest of the poster.



Experiment as an in-Text Reference. If you are in a poster session, you should use the same font size as the text in the rest of the poster. Do not use a different font size for the text in the rest of the poster.



Experiment as an in-Text Reference. If you are in a poster session, you should use the same font size as the text in the rest of the poster. Do not use a different font size for the text in the rest of the poster.

#### Results

**Printing the results...**  
 Images such as photographs, graphs, diagrams, logos, etc. can be added to the poster. To insert scanned images to your poster, go through the menu: Insert > Picture > From File. In the File dialog box, select the image you want to insert. The format of the image is important. JPEG or TIFF, JPEG is the preferred format. Be aware of the image size you are printing. The average color photo (13" x 19" at 300 dpi) would be about 3MB. 11MB for a 300 dpi grayscale. Call MUH for more information. Do not use images from the web.

#### How to use graphs

For simple graphs use MS Excel or other graphing software in Power Point.

Graphs done in a scientific graphing program (eg. Sigma Plot, Origin, SPSS, etc.) should be saved as a JPEG or TIFF if possible. For more information see MUH.



Experiment as an in-Text Reference. If you are in a poster session, you should use the same font size as the text in the rest of the poster. Do not use a different font size for the text in the rest of the poster.



Experiment as an in-Text Reference. If you are in a poster session, you should use the same font size as the text in the rest of the poster. Do not use a different font size for the text in the rest of the poster.

#### Printing and Lamination

Once you have completed your poster, bring it down to MUH for printing. We will produce a 33" board size poster. You will check and proof read. The final poster will then be printed and laminated. Do not take your poster until you have been advised. See the MUH website for more information. Simply highlight the text and replace.

#### Cost...

For poster printing and lamination charges contact MUH.



# Perfect!

#### Conclusion

For more information on Poster Design, Scanning and Digital Photography, and Image Resizing.

#### Contact

Medical Illustration Unit  
 Princeton Medical Hospital  
 Ph: 202.280.2800  
 Email: [medillustr@princeton.edu](mailto:medillustr@princeton.edu)  
 Website: [www.medillustr.com](http://www.medillustr.com)

#### Acknowledgements

Simply highlight the text and replace it with your own text. Replace it with your text.

### A Large-Scale Public Library Renovation in Taiwan



**A Large-Scale Public Library Renovation in Taiwan**

Library Association of R.O.C.  
National Teaching Library of Taiwan

**ABSTRACT**

There are 325 public libraries, including university and village public libraries, in Taiwan. As most were built in 1980s, they are not fit in the digital environment to meet users' needs.

In order to upgrade the quality of public library services in Taiwan to meet users' needs and to foster lifelong learning, in 2003, the central government of Taiwan approved a budget of T\$1.2 billion (US\$ 4 million) as a large-scale public library renovation project in 321 public libraries.

National Teaching Library was designated as coordinate library to execute the project from February 2003 to June 2004. 321 public libraries were divided into eight groups according to the geographical area, and a steering committee was formed, consisting 96 committee members from the fields of library and information sciences, architecture, space design, literature, and history. 96 committee members were assigned to one of eight groups of 321 public libraries to help and to give suggestions of renovation, improvement, replacement, service programs of each library.

The project was executed and completed efficiently and effectively in June 2004. This poster presentation will display the results of the renovation, improvement, replacement, library management, and services of 321 public libraries in Taiwan. The contents of the poster will be explained by words, pictures, and statistical tables.

**Keywords:** Public libraries  
<http://www.ntl.gov.tw>

**Background**

For last three decades, reading services were almost only in traditional paper-based books. With the development of information technology, the digital environment has become an important part of the library services. The digital environment is not only a new way of reading, but also a new way of learning. The digital environment is not only a new way of reading, but also a new way of learning. The digital environment is not only a new way of reading, but also a new way of learning.

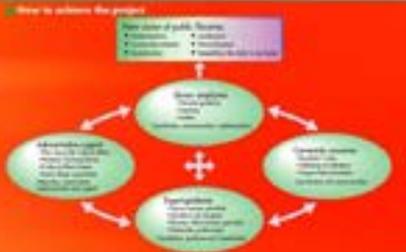
**Figure 1 | Number of libraries at each administrative level involved in the renovation project**



**Figure 2 | Number of Public Libraries in Taiwan**

Category	Number	Total
University	10	325
Village	215	325
Public	100	325

**Process within the renovation design and internal setting of libraries**



**Results | Integrating between public representatives | Funding and staff | Rejuvenation of public library services | New information service**

- Integration**
  - Library Association of R.O.C., National Teaching Library of Taiwan, National Sun Yat-sen Memorial Library
- Integrating between public representatives**
  - Library Association of R.O.C., National Teaching Library of Taiwan, National Sun Yat-sen Memorial Library
- Funding and staff**
  - Library Association of R.O.C., National Teaching Library of Taiwan, National Sun Yat-sen Memorial Library



[www.ntl.gov.tw](http://www.ntl.gov.tw)



Oh my gawd!

## WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?

Darm Kalisak, PES Student

Contact: ddk2@cornell.edu

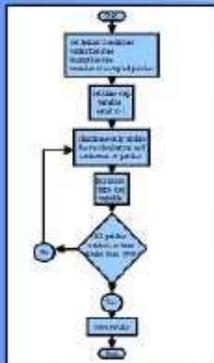
### INTRODUCTION AND OBJECTIVES

Many people are interested in understanding how well a structure performs in terms of different material properties and how the structure can be modified to improve its performance. In particular, a large portion of this research is focused on the design and optimization of structures that are used in the aerospace industry. One of the most common structures used in the aerospace industry is the honeycomb structure. The honeycomb structure is a type of cellular structure that is composed of many small cells. The honeycomb structure is a type of cellular structure that is composed of many small cells.

One of the most common structures used in the aerospace industry is the honeycomb structure. The honeycomb structure is a type of cellular structure that is composed of many small cells. The honeycomb structure is a type of cellular structure that is composed of many small cells.

One of the most common structures used in the aerospace industry is the honeycomb structure. The honeycomb structure is a type of cellular structure that is composed of many small cells. The honeycomb structure is a type of cellular structure that is composed of many small cells.

### THE PROGRAM



#### ASSUMPTIONS AND LIMITATIONS

Additional design parameters were added to the model which led to the number of patches in the model being increased. In this case, we wish to compare the effect of the number of patches on the performance of the structure.

Changing patch size was not included in the model, but the number of patches was increased to account for the increase in the number of patches.

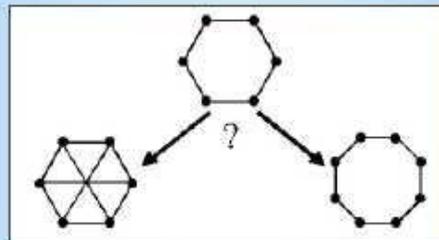
Each patch was assumed to be a square. The shape of the patch was not included in the model.

All design parameters were assumed to be constant. The number of patches was not included in the model.

The model did not include the effect of the number of patches on the performance of the structure.

The model was designed to be a simple model. The number of patches was not included in the model.

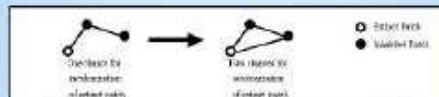
### THE ISSUE



A single patch is a collection of discrete patches, in which individual patches are typically connected and are separated. In the long-term, the overall performance is improved by adding more patches or by increasing the number of connections between existing patches.

Adding patches increases the overall performance of the structure, and increases its total weight, but this by increasing the total number of patches which would have to go into it.

Adding connection pathways can improve the overall performance of the structure, by giving direct paths from one patch to another.

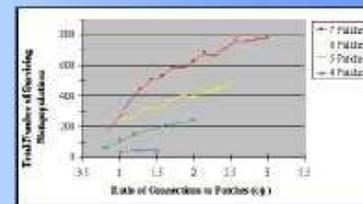


### RESULTS

Tracked the results by using a metric which represents the performance of the structure.

- number of patches (cases 1, 2, 3, 4, 5, 6, 7)
- randomly connected and randomly connected structure
- the ratio of indirect pathways to direct pathways, only
- the ratio of indirect pathways to direct pathways, only
- the ratio of indirect pathways to direct pathways, only

The overall performance of the structure was tracked by using a metric which represents the performance of the structure. The overall performance of the structure was tracked by using a metric which represents the performance of the structure.



### CONCLUSIONS

The number of the total patches that were present, along with the connectivity of the patches, were the most important factors in determining the overall performance of the structure. The overall performance of the structure was tracked by using a metric which represents the performance of the structure.

It is worth noting that in the model, the overall performance of the structure was tracked by using a metric which represents the performance of the structure. The overall performance of the structure was tracked by using a metric which represents the performance of the structure.



Nice flow, but too metallic

### Fusing <sup>18</sup>F-FDG-hybrid PET To CT Images Significantly Alters Treatment Planning In The Radical Treatment Of Non-Small Cell Lung Carcinoma

Y.C. Ung, M.D., C.B. Caldwell, Ph.D.,<sup>1</sup> K. Mah, M.Sc., C.J. Dunjovics, M.D., J.M. Balogh, M.D., S.N. Ganguli, M.D.,<sup>2</sup> R.G. Tama, B.Sc., and L.E. Eberich, M.D.<sup>1</sup>  
<sup>1</sup>Toronto-Sunnybrook Regional Cancer Centre, Sunnybrook and Women's College Health Sciences Centre,<sup>1</sup> and University of Toronto, Toronto, CANADA

**Abstract**  
 A prospective phase II study was conducted to determine the impact of integrating PET and CT images into CT plan-based radiation treatment of non-small cell lung cancer. Twenty-two patients were included in the study. PET-CT scans were obtained using CT and PET images. PET-CT scans were fused to the CT images. The percentage of patients who had PET-CT scans was 100%. PET-CT scans were fused to the CT images. The percentage of patients who had PET-CT scans was 100%. PET-CT scans were fused to the CT images. The percentage of patients who had PET-CT scans was 100%.

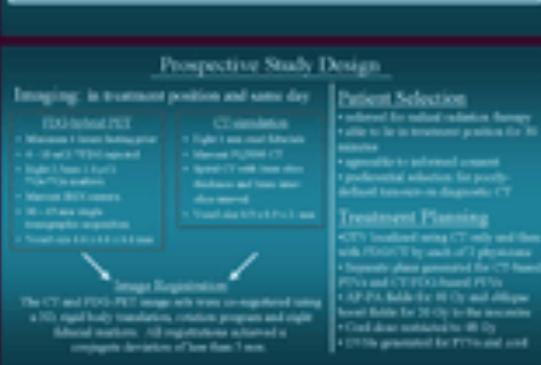
**Potential of <sup>18</sup>F-FDG-hybrid PET for Radiation Therapy Planning**  
 Fluorodeoxyglucose (FDG) is a glucose analogue that is metabolically trapped in cells. Many malignancies are associated with increased glycolysis and thus demonstrate increased uptake of FDG. In lung cancer staging, FDG-PET has proven to have greater sensitivity and specificity than CT<sup>1,2</sup>. In radiation planning, it may help to distinguish between tumor and other processes such as inflammation. As a functional imaging modality, FDG-PET may complement the anatomic data from CT.



Figure 1. PET-CT provides functional information which delineates malignant from benign nodules. Increased uptake indicates a high level of FDG uptake, representing malignancy.

**Study Objective:** To determine the impact of integrating <sup>18</sup>F-FDG-hybrid PET images with CT planning images on treatment planning of patients with NSCLC.

**Problem**  
 Local control with radical radiation therapy for non-small cell lung carcinoma (NSCLC) is often poor. Some evaluation with PET/CT has the potential to improve outcome. The evidence for this approach is the ability to accurately define the gross-tumor volume (GTV). We are comparing imaging techniques such as CT or MRI. It is often difficult to distinguish malignant from normal tissues, particularly when anatomic parameters or normal tissue displacement occurs. CT and MRI are also not well suited to determining which, if any, non-malignant lymph nodes are involved. A robust, more sensitive to lymph node involvement would help guide treatment strategies.



**Impact of FDG-hybrid PET on Patient Management**

In 5/26 (19%) patients, radiation therapy was changed from radical to palliation intent.

Figure 1. Case example where therapy was changed from radical to palliation intent because of the recognition of FDG-PET data on PET-CT scans. (a) PET and CT images showing a large central mass. (b) PET-CT image showing a large central mass. (c) PET-CT image showing a large central mass.

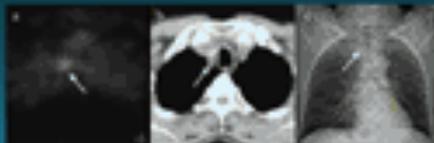


Figure 2. Case example where therapy was changed from radical to palliation intent because of the recognition of FDG-PET data on PET-CT scans. (a) PET and CT images showing a large central mass. (b) PET-CT image showing a large central mass. (c) PET-CT image showing a large central mass.



Figure 3. Coverage of PTV<sub>CT+PET</sub> based on the CT only plan. The results on the average of 11 patients. In 4 cases, less than 90% of the PTV<sub>CT+PET</sub> was covered by the CT only plan. In 7 cases, more than 90% of the PTV<sub>CT+PET</sub> was covered by the CT only plan.



**Impact of Co-registered FDG-hybrid PET on PTV Coverage**

In 9/23 (39%) patients, the volume of PTV<sub>CT+PET</sub> receiving at least 90% of the prescribed dose with the CT only-based plan was less than 90%.



Figure 4. Coverage of PTV<sub>CT+PET</sub> based on the CT only plan. The results on the average of 11 patients. In 4 cases, less than 90% of the PTV<sub>CT+PET</sub> was covered by the CT only plan. In 7 cases, more than 90% of the PTV<sub>CT+PET</sub> was covered by the CT only plan.



**Impact of FDG-hybrid PET on Spinal Cord Dose**

In 10/23 (43%) cases, the maximum cord dose was reduced by more than 200 cGy with CT-FDG data.



Figure 5. The maximum dose to the spinal cord in the CT only and CT-FDG plan was shown for each patient. The results on the average of 11 patients. In 4 cases, the maximum dose to the spinal cord was reduced by more than 200 cGy with CT-FDG data.

**Discussion**  
 The impact of integrating <sup>18</sup>F-FDG-hybrid PET with CT simulation was assessed in terms of patient management, PTV coverage, and maximum dose to spinal cord. In 19% (5/26) of patients, FDG hybrid PET resulted in a change in management. In 10% (1/10) the CT based plan would have resulted in significant geographic miss, and in 9% (1/11) the cord dose was reduced by 200 cGy or more. The impact was most significant in those with evidence of previously unsuspected metastases. For the former group, others have reported changes in their plans when using PET-CT data.<sup>3</sup> In this study, plans were generated separately for the CT and PET images independently to the physician and radiotherapist for the average. Radiotherapy planning results can vary and PET-CT can play a role in reducing physician variance in treatment.<sup>4</sup>

**Conclusions**  
 The timing of FDG hybrid PET images to CT planning images significantly altered treatment plans in 19% of our cases. Integration of FDG hybrid PET into radiotherapy planning increases the probability of geographical misses and results in a documented step in PET-CT for lung cancer.

**References**  
 1. J Clin Oncol 1998;16:1029-1038.  
 2. J Clin Oncol 1998;16:1029-1038.  
 3. J Clin Oncol 1998;16:1029-1038.  
 4. J Clin Oncol 1998;16:1029-1038.



I've fallen, and I can't get up



### Your Ingenious Teaser Right Here to Woo Them Down to the Body

The name of the author is 23pt regular

#### Conclusions first: 44 pt bold

Always put the most important part - your conclusions - first! Place your conclusions in the upper left hand corner of your poster.  
Prepare your material from the reader's perspective. What was done, by who and your conclusion has to be understood within a couple of second's reading! Use active voice when writing the text. **font size: 34 pt regular**



Use photos of 18pt bold  
Image caption 23pt regular

#### Introduction

Posters are primarily visual presentations. Your poster should be dominated by self-explanatory illustrations such as graphs and pictures while the amount of text should be kept to the minimum.

#### Your aim

Your poster is an advertisement for your research and as such it needs to be eye-catching and straight to the point. You only have seconds, or at best a few minutes to attract the attention of the visitor to a poster session. Keep your message short and clear

#### Your message

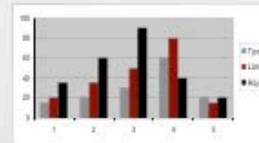
Keep your message clear and your text concise. Decide what is relevant for this poster and try to get your message across to your target group.

#### Layout, photos and print

Contact [Marie Perle](#) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [Björn Eriksson](#). For more information: [www.bildmaterna.kth.se](http://www.bildmaterna.kth.se)



Always write a descriptive caption 23pt regular



Always write a descriptive caption 23pt regular

#### Tips:

The best font for text blocks that are as short as they should be on a poster is a Sans Serif typeface family. Therefore, use sans serif fonts such as Arial or **Verdana** sans rather than serif fonts like Times or Courier.  
AVOID CAPITAL LETTERS IN TEXTS THAT ARE LONGER THAN ONE LINE, SINCE THEY ARE MORE DIFFICULT TO READ.

#### Handouts

If you succeed in getting the reader's attention, provide her/him with more detailed information in the form of handouts or printed articles. Include references on your handout instead of your poster.

It is always nice to put in a picture and write some few short notes of what's going on in the future. Put handouts, business cards, nearby - on a table or in an envelope hung with the poster.



# Gorgeous!

## LESSONS LEARNED FROM AIRWAY PRESSURE RELEASE VENTILATION (APRV)

Lewis J. Kaplan, MD<sup>1,2</sup>, Heatherlee Bailey, MD, FAAEM<sup>1,2</sup>  
 Medical College of Pennsylvania-Hahnemann University

Departments of Surgery<sup>1</sup> and Emergency Medicine<sup>2</sup>, Philadelphia, PA USA

### INTRODUCTION

Airway Pressure Release Ventilation (APRV) (a.k.a. BiPAP) has been previously demonstrated to be a useful modality to manage patients with acute lung injury (ALI) or the acute respiratory distress syndrome (ARDS). As this is a fundamentally different mode than conventional cyclic ventilation, we reviewed a single institution's experience with APRV to determine safety, complication detection, and efficacy at resolving hypoxemia and hypercarbia.

### METHODS

Consecutive patients transitioned from either volume or pressure targeted ventilation to APRV (Dräger Esch 4 Pulmonary Workstation) at a University hospital surgical ICU were retrospectively reviewed. Patients initially ventilated with APRV were excluded. Initial APRV settings to correct hypoxemia ( $pO_2 \leq 60$  torr or  $FIO_2 \geq 0.9$ ) were a  $P_{high}$  at the prior plateau pressure, a  $T_{high}$  of 0.0 sec and a  $T_{low}$  of 0.8 sec. Hypercarbic ( $pCO_2 \geq 55$  torr and  $pH \leq 7.3$ ) patients were set at a  $T_{high}$  of 5.0 sec and a  $T_{low}$  of 1.0 sec. Settings were adjusted to resolve hypoxemia and hypercarbia. IRB approved abstracted data included principal diagnoses, ventilator parameters, laboratory values and ventilator-associated complications. Data before and after APRV were compared using a two-tailed paired t-test or Chi-square as appropriate; significance was assumed for  $p < 0.05$  (<sup>1,2</sup>).

### RESULTS

#### Demographics

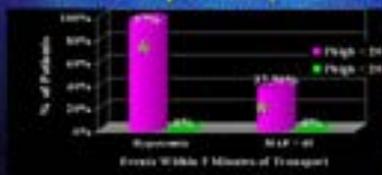


#### APRV

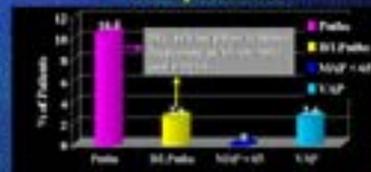


Element	Value
% Hypoxemia	88%
% Hypercarbia	12%
Time to $S_{t}O_2 \geq 92\%$	$7 \pm 4$ min
Time to $FIO_2 \leq 0.6$	$5.2 \pm 0.9$ hr
Time to $pCO_2 \leq 40$ torr	$42 \pm 7$ min
Time to max $\Delta pCO_2$	$76 \pm 17$ min
Mean change in $V_T$	$-3.3 \pm 0.9$ L/min <sup>3</sup>

#### Transport Safety



#### Complications



### CONCLUSIONS

1. APRV is a safe rescue mode for hypoxemic or hypercarbic respiratory failure and requires a significantly lower  $V_T$  than conventional ventilation.
2. Decreasing release phase volumes and a rising  $pCO_2$  are strong indicators of pneumothorax in a patient on APRV. Routine end-tidal  $CO_2$  monitoring is recommended.
3. Preparation for safe intra-hospital transport may be keyed to the  $P_{high}$  required for oxygenation and ventilation. Patients requiring a  $P_{high} > 20$  cm  $H_2O$  should be transported on the ventilator.



Welcome to  
 the 80's  
 Fer sure!

### Poster title goes here, containing strictly only the essential number of words...



Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here

Address/es Goes Here, Address/es Goes Here, Address/es Goes Here



#### Introduction

**Check** - All content requires a brief recapitulation of the main objectives, background and purpose. Do not overstate the significance of the work. Do not overstate the significance of the work.

#### Aim

**Check** - The aim should be clear and concise. It should be a single sentence. It should be a single sentence.

#### Methods

- The methodology should be clearly stated.

#### Results

**Check** - The results should be clearly stated. The results should be clearly stated.

#### Discussion

**Check** - The discussion should be clearly stated. The discussion should be clearly stated.

#### Conclusions

**Check** - The conclusions should be clearly stated. The conclusions should be clearly stated.

#### References

**Check** - The references should be clearly stated. The references should be clearly stated.

#### Appendix

**Check** - The appendix should be clearly stated. The appendix should be clearly stated.

#### Acknowledgements

**Check** - The acknowledgements should be clearly stated. The acknowledgements should be clearly stated.



This works!



## Helpful sites on poster presentations:

<http://colinpurrington.com/tips/academic/posterdesign>

<http://www.ncsu.edu/project/posters/NewSite/>

# LiLynn Graves

Web and Graphic Designer, CCMR



# CCMR

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Cornell University, Ithaca, NY

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