

# Scientific Poster Design

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





# 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...

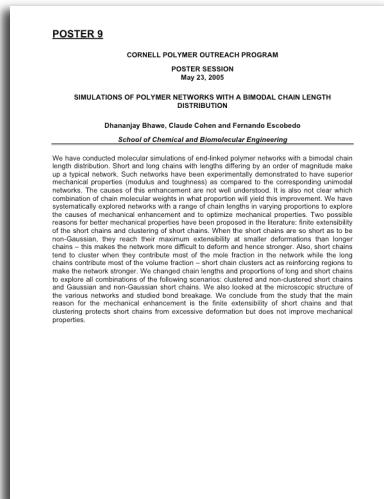
An advertisement of your hard work



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



# It's just an illustrated abstract



**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**  
**For ...**  
 Check with conference organizers on their specifications of size and orientation before you print out your poster. If necessary, use a poster software. The poster at the University of Waterloo template (1000x1000), landscape format, looks good. Don't change the page size. You can scale it to a smaller or larger size when printing. You need a different paper with either a portrait or a landscape paper template.

**Bar charts you can use all the available space allocated by some conference organizers (e.g. Waterloo in 10x10). Don't make your poster bigger than necessary. Don't use too many colors.**

**Method**  
**For making a successful poster ...**  
 1. Rewrite your paper in poster form. Is simply everything and do not fill.

- Headings and subheadings should be in upper and lower case letters.
- Headlines or sentences in capitals or underline bold characters should.
- When writing your poster leave breathing space around you text. Don't overcrowd your poster.
- Try using photographs or colour graphics. Avoiding numerical tables.
- Spared check your poster for mistakes.

**Results**  
**For printing files ...**  
 Hayes such as photographs, graphs, diagrams, logos, etc. can be saved as a poster.

**For presentation ...**  
 To print out the image of your poster go through the following steps. You can print from Microsoft Word or from your computer, select a printer OK. Then save the image as a bitmap (BMP or TIFF, JPEG or PDF) file.

**For presentation ...**  
 You can print out the image of your poster from Microsoft Word or from your computer, select a printer OK. Then save the image as a bitmap (BMP or TIFF, JPEG or PDF) file.

**Conclusion**  
**For presentation ...**  
 For presentation use a Power Point.

**For presentation ...**  
 Graphics and a scientific graphics program (e.g. Sigma Plot, Prism, SPSS, Statistica) should be saved as JPEG or TIFF (possible). For presentation use a poster.

**Acknowledgements**  
**Just right to acknowledge your own ...**  
 Replace this with your text.



# 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

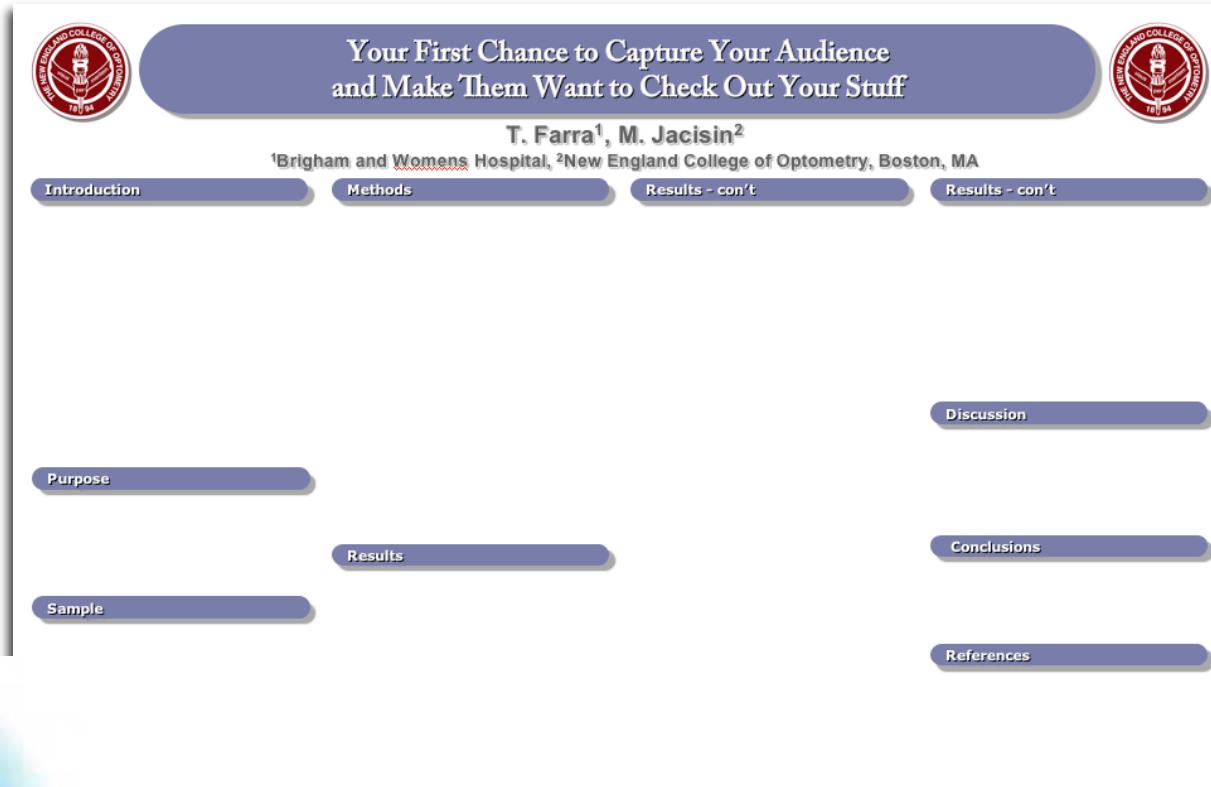


Recite after  
me,  
Less is best!





## Simplify your paper into poster format

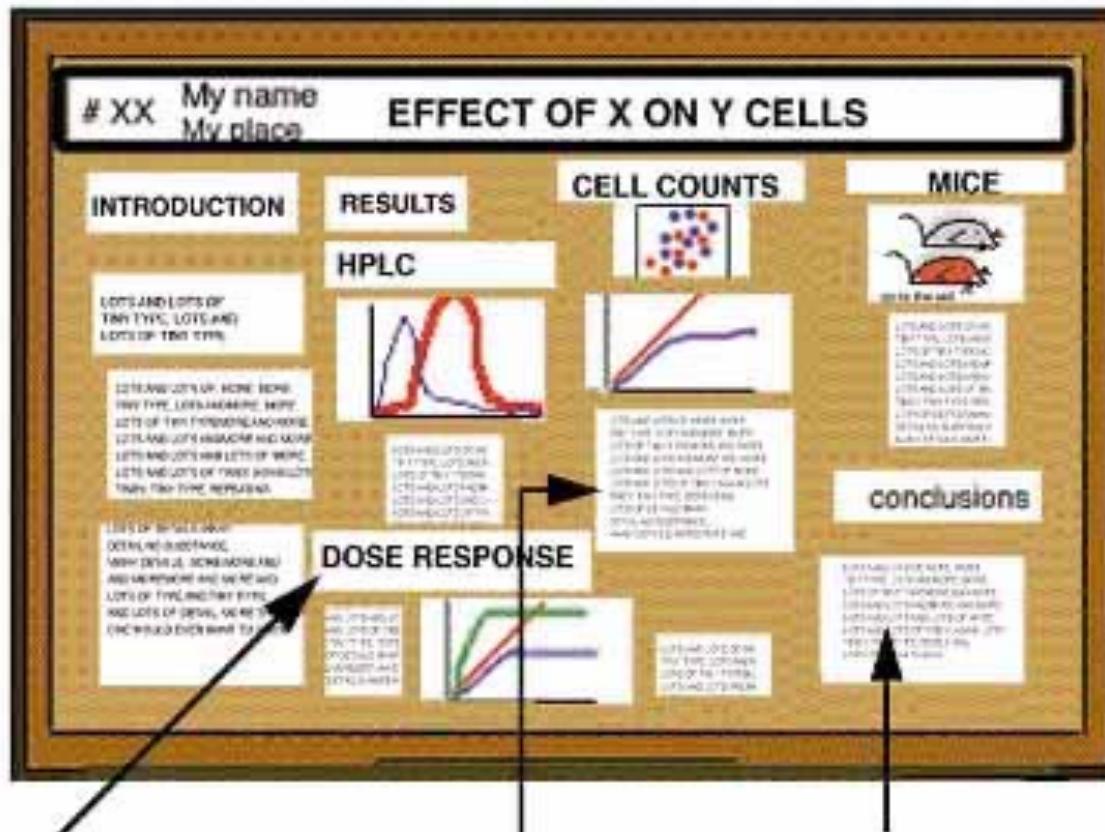


Find out the size required!

# Who's my audience?



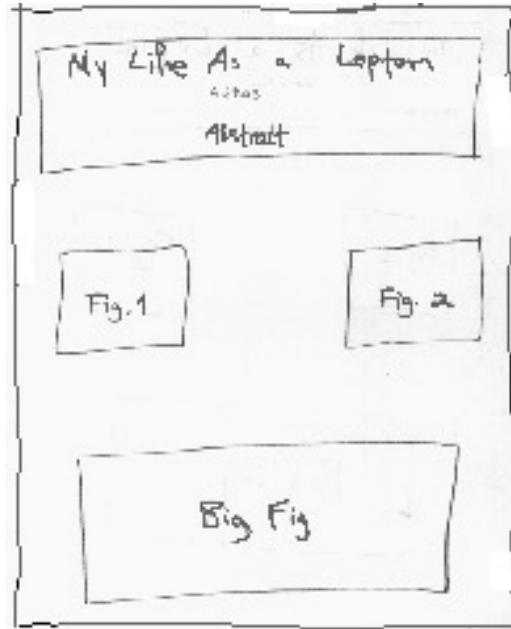
Remember, most of these “scientists”  
come for the free food



Large type  
states methods,  
not results

Results  
artfully buried in a  
methods description

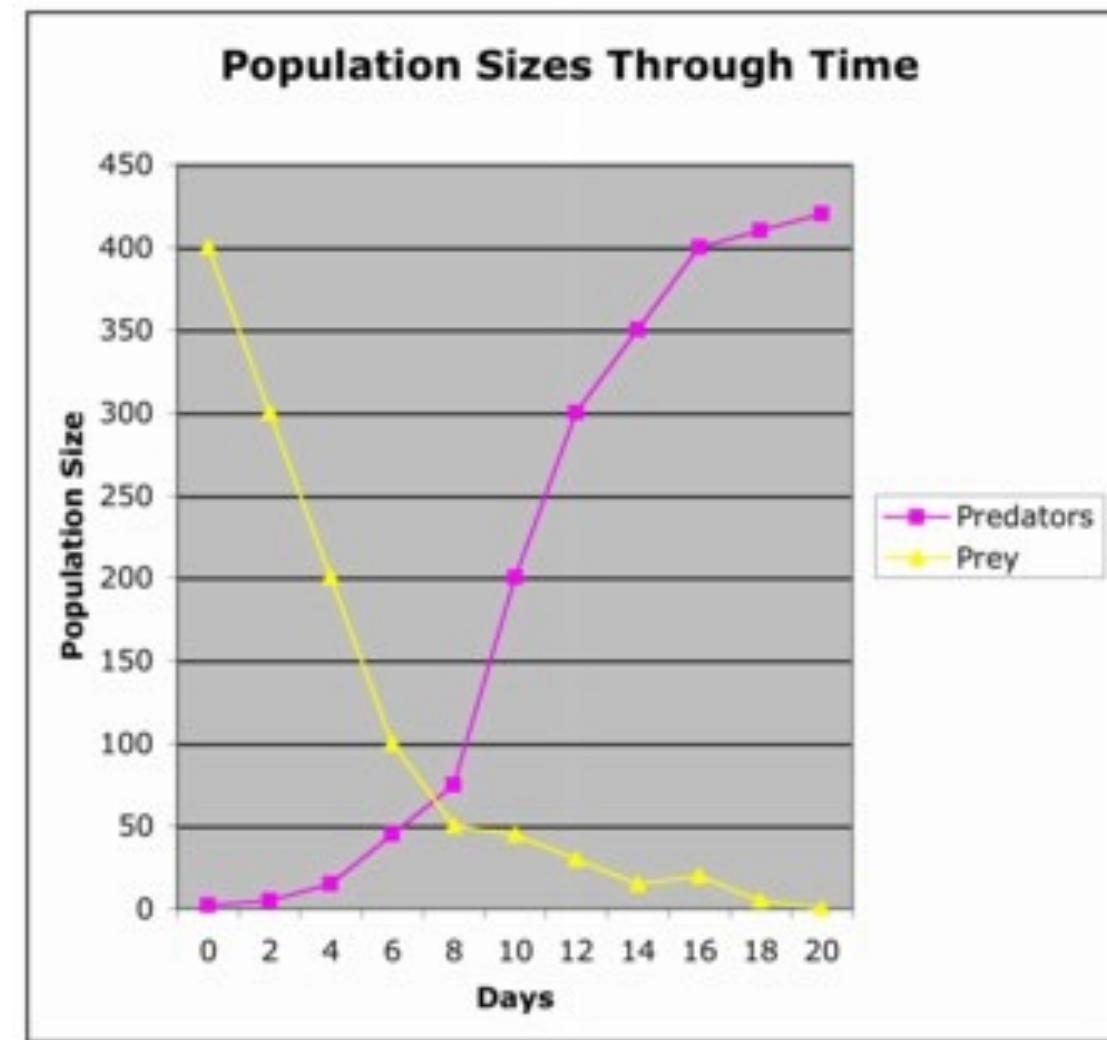
Carefully  
omits  
interpretations

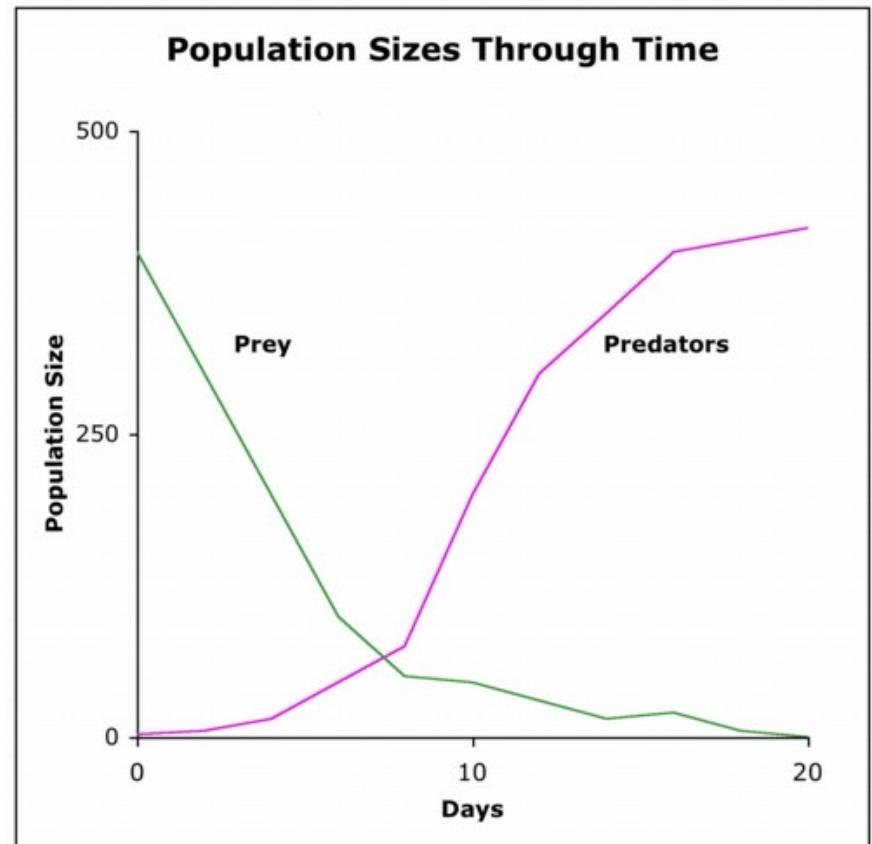
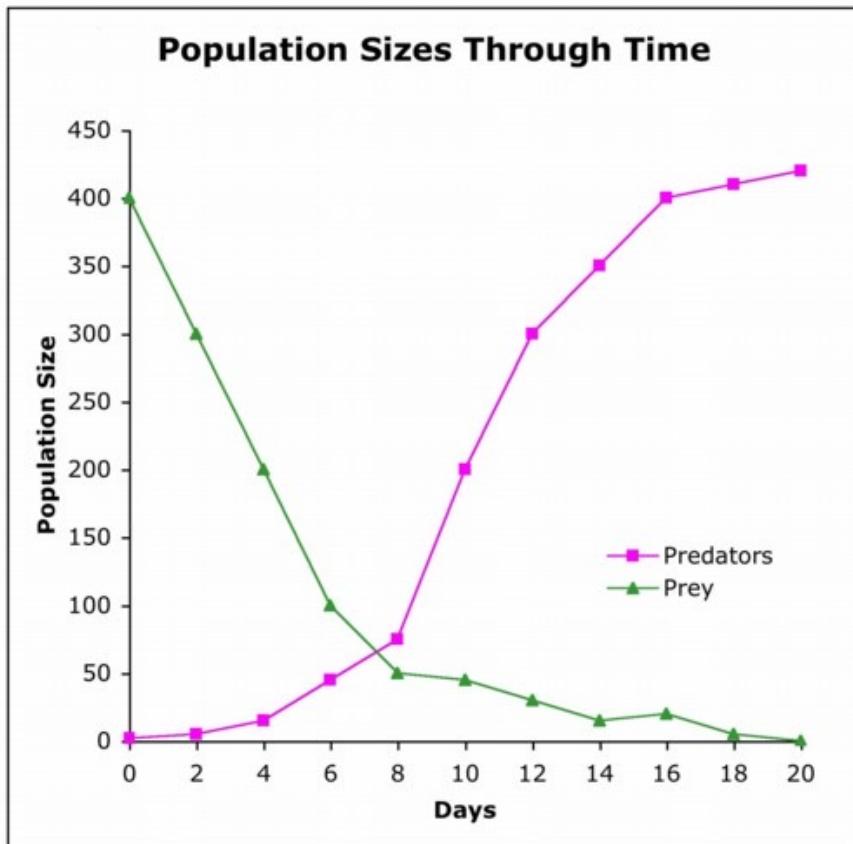


Start putting  
together your  
2 main elements

## 1) Simple, effective data displays

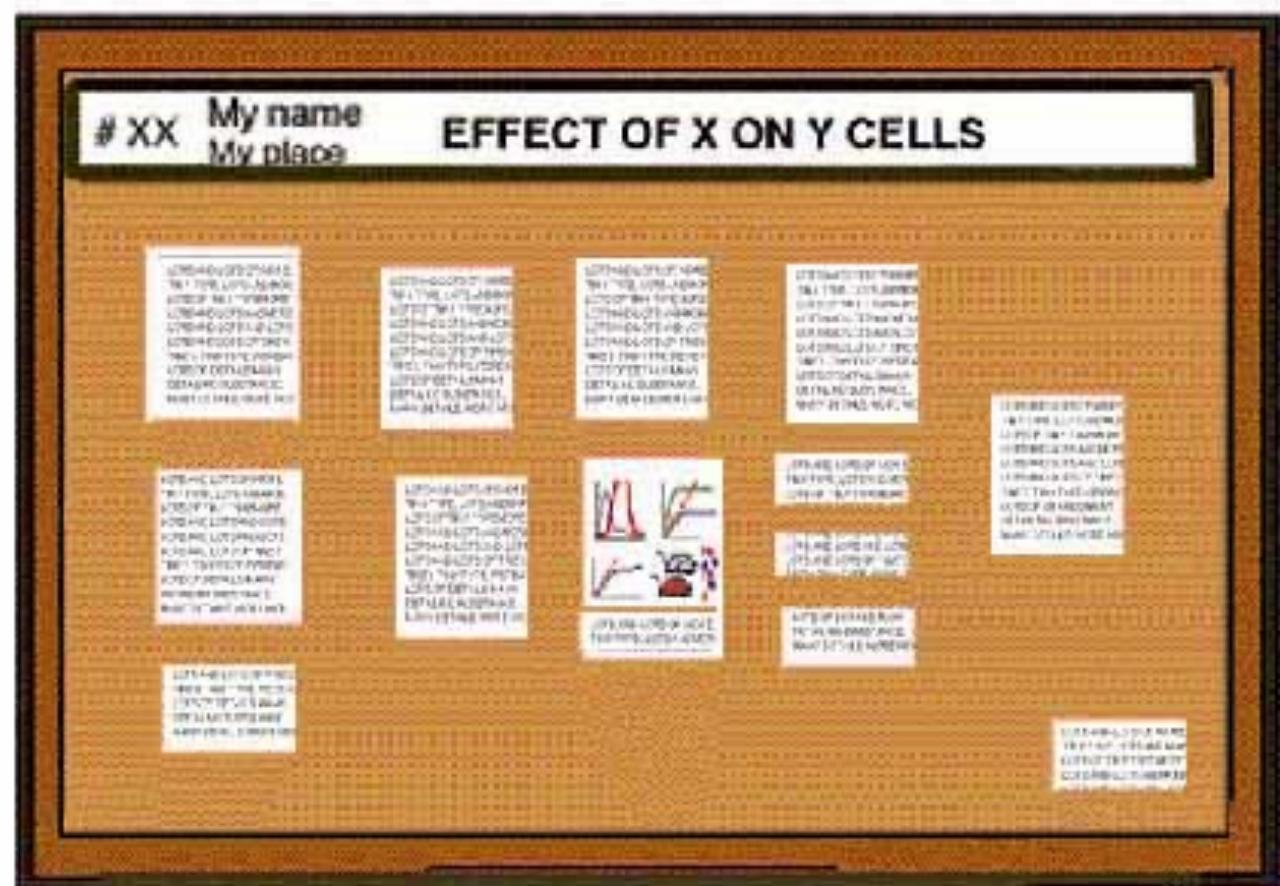
Don't make them  
stand on their  
heads to read your  
data!





## 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

# 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 transgenics**  
  
This kind of mice to  
help animal, particularly  
and some. Cells.

**2 in situ**  
  
Lots of tiny type, is  
tiny, tiny, tiny type, I  
and lots of tiny typ  
stain and lots of det  
and more details.

**3 cell counts**  
  
and lots of tiny typ  
of time, time, tiny typ

**4 dose response**  
  
and lots of tiny typ  
details and lots of  
tiny type and more  
tiny tiny tiny type.

**5 HPLC**  
  
Lots of tiny type, is  
tiny, tiny, tiny type, I  
and lots of tiny typ  
stain and lots of det  
and more details.

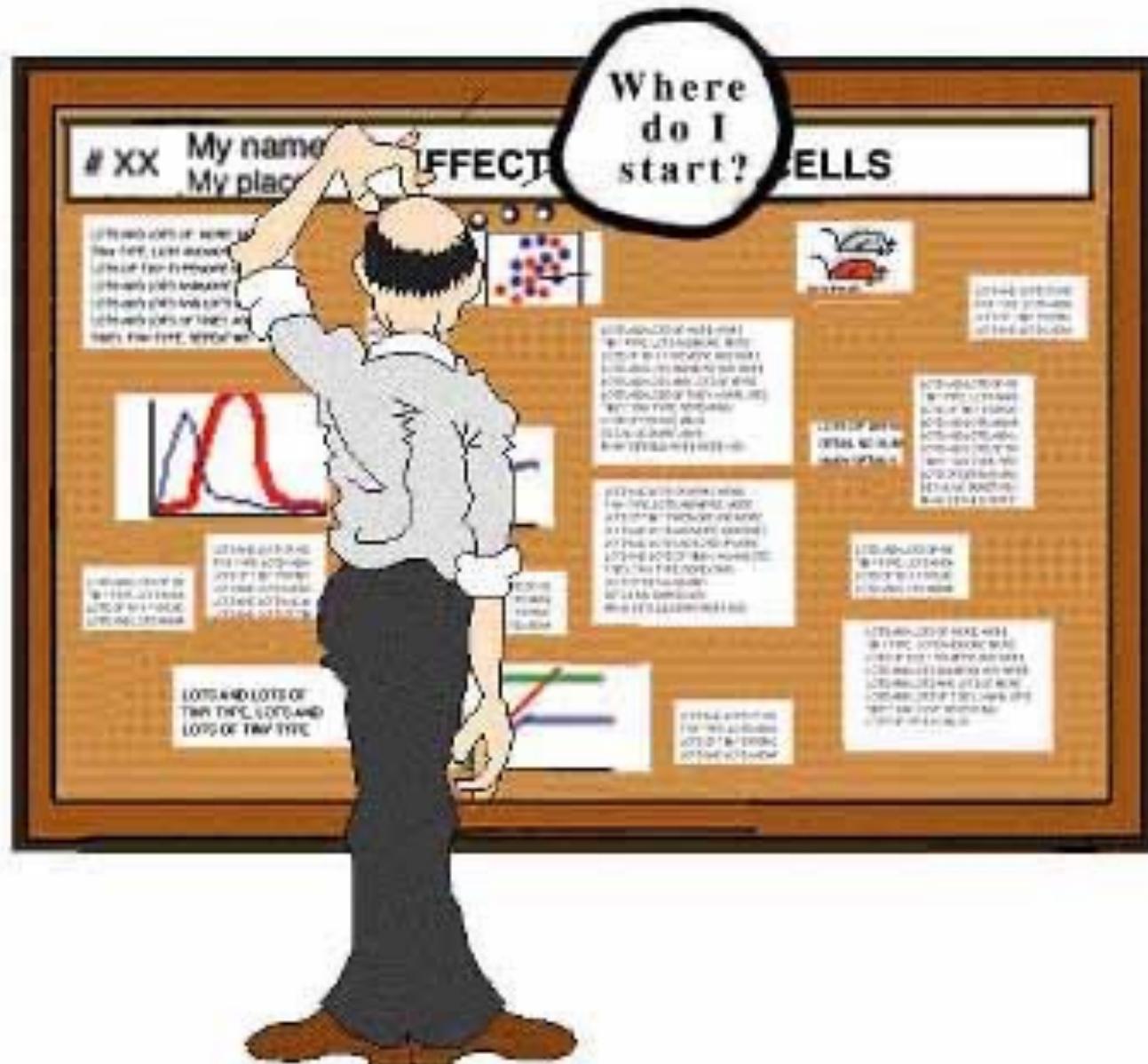
**6 discussion**  
X is important  
Lots of tiny type, is  
tiny, tiny, tiny type, I  
and lots of tiny typ  
stain and lots of det  
and more details.

**Conclusions**  
Lots of details, more  
on details. Lots of  
pe. Lots of type.

1 lots of tiny type, is  
tiny, tiny, tiny type, I  
and lots of tiny typ  
stain and lots of det  
and more details.

2 and lots of tiny typ  
of time, time, tiny typ  
the result of these

**big** **medium** **big** **small** **big** **medium**





# 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
- Somewhat Inflexible
- Designed for overhead projection

(be sure to print a color proof to  
see actual colors you have chosen)

# Adobe Illustrator or InDesign



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



Let's design a poster!



## Your poster title:

# Think BIG! Really Big!

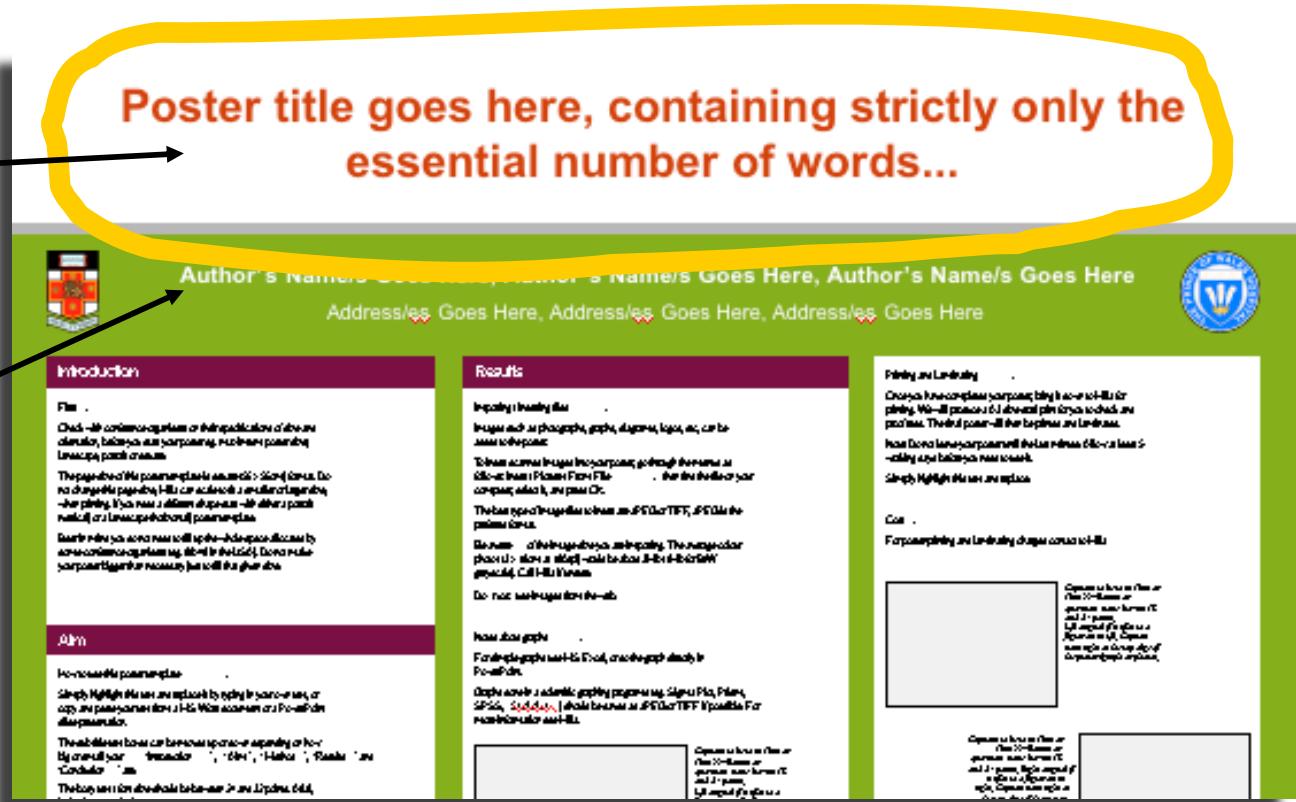
Your biggest impact!

**Boldface** type

Not all caps!

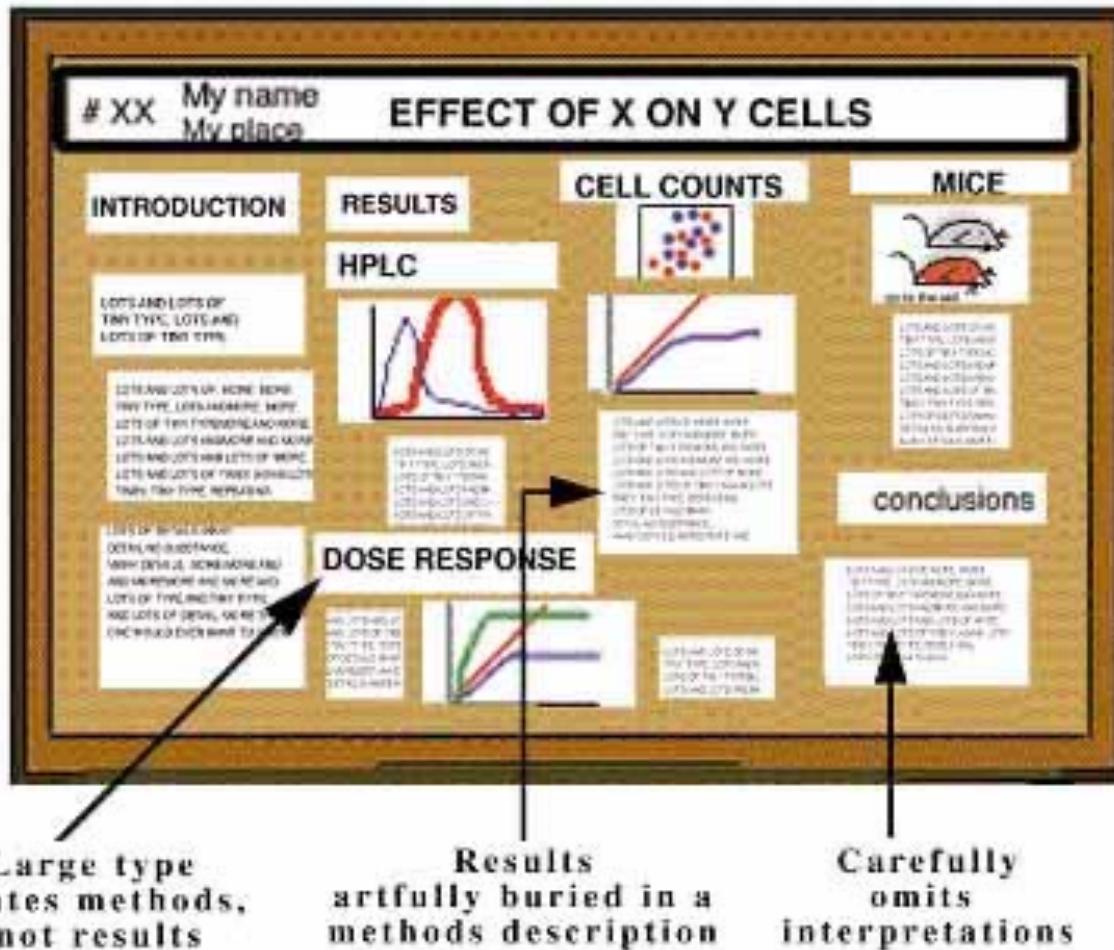
Group authors  
names and  
affiliations

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



The template features a green header bar with the Cornell Engineering logo and the text "Author's Name/s Goes Here, Author's Name/s Goes Here" and "Address/ies Goes Here, Address/ies Goes Here, Address/ies Goes Here". The main content is organized into three columns: "Introduction", "Results", and "Conclusions". Each column has a purple header and a purple footer. The "Introduction" section contains text about poster guidelines and copyright. The "Results" section contains text about image insertion and copyright. The "Conclusions" section contains text about printing and copyright. Arrows from the text on the left point to the "Introduction" and "Results" sections of the template.

# The Secrets of Readable Text:





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/ies Goes Here, Address/ies Goes Here

**Introduction**

**AIM**

**Results**

**Conclusion**

**Acknowledgements**

- Leave breathing space around your text
- Serif font works great here for the small text
- Same size and style in all blocks of copy

# Conclusions first!

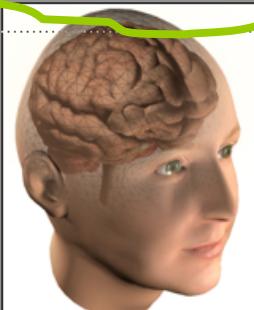
- Put the most important part first!
- Short and to the point!
- Upper left hand corner
- If they like it, they will stick around!

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

*Therapeutic Agents 28 regular*

**Karolinska Institutet**

**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. *textsize: 34 pt regular*

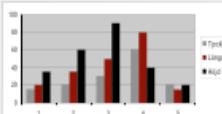


**Introduction**  
Posters are primarily visual presentations. Your poster should be dominated by self-explanatory illustrations such as graphs and pictures while the amount of text should be kept to the minimum.

**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 [Bibliotekanm.kth.se](http://bibliotekanm.kth.se) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [www.bildmedarbetare.kth.se](http://www.bildmedarbetare.kth.se). For more information: [www.bildmedarbetare.kth.se](http://www.bildmedarbetare.kth.se)



**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 *Mono* 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.

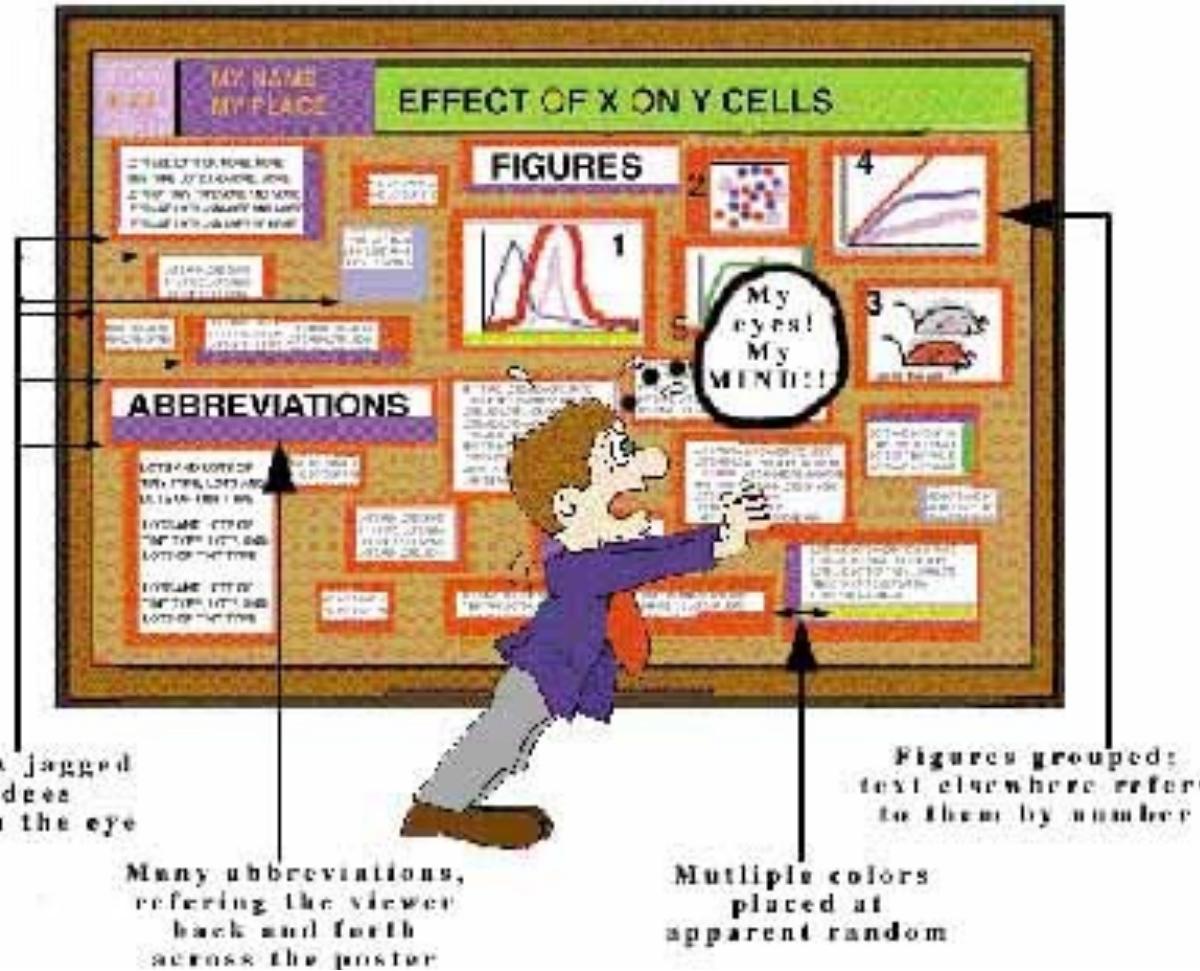
**Handouts**  
If you succeed in getting the reader's attention, provide her/him with more detailed information in the form of handouts or printed articles. Include references on your handout instead of your poster.



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.

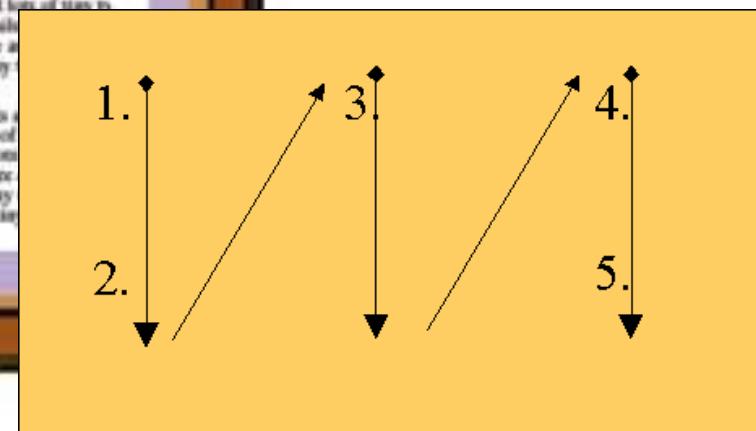
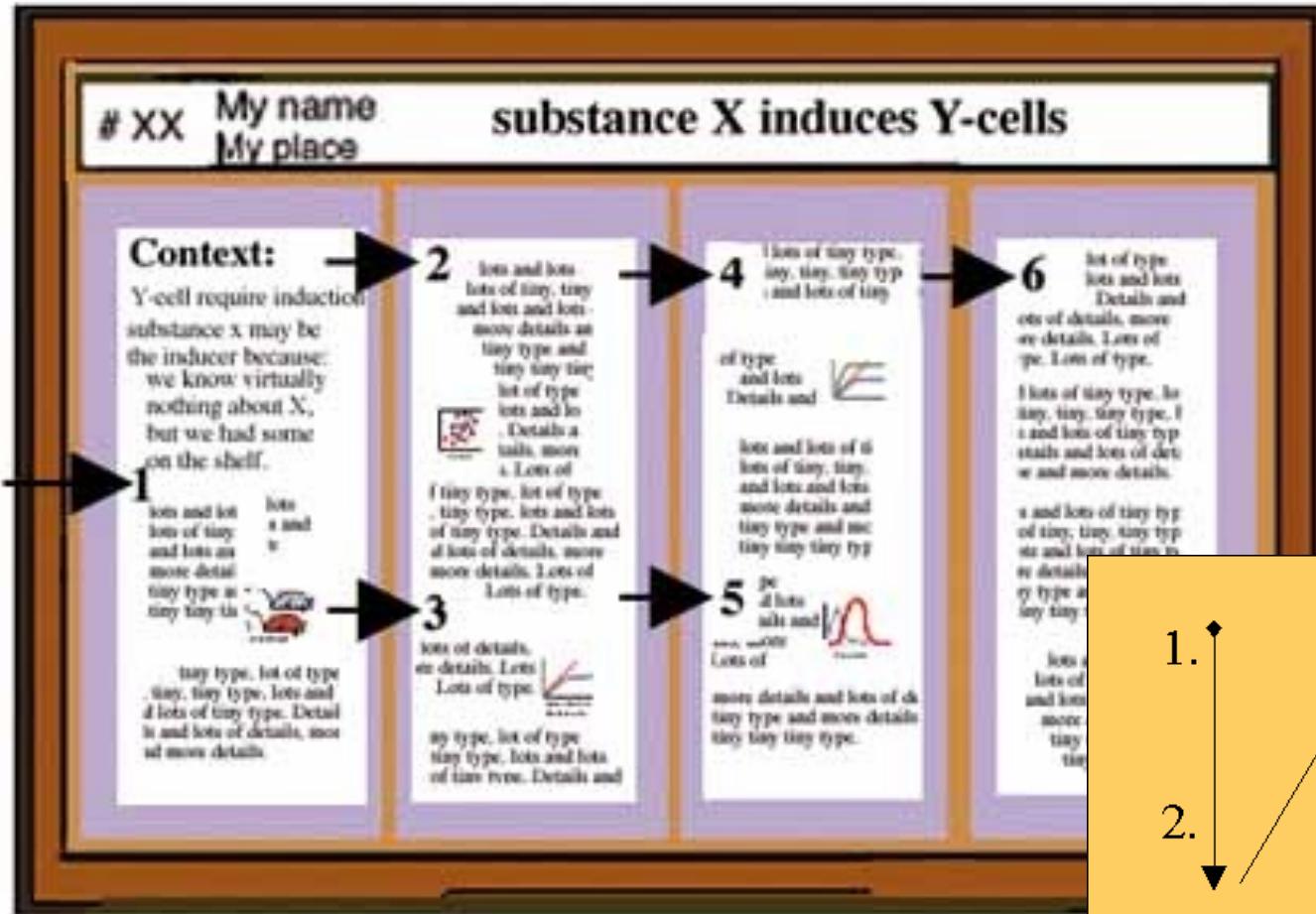
**Footer:**  
Karolinska Institutet  
Postbox 35700, 100 15 Stockholm  
Sweden  
Visiting address: Karolinska Institutet  
Postbox 35700, 100 15 Stockholm  
Sweden  
Telephone 08 514 92 20  
Fax 08 514 92 200  
Email: [medarbetare.kth.se](mailto:medarbetare.kth.se)

## Design it easy for the eye to follow

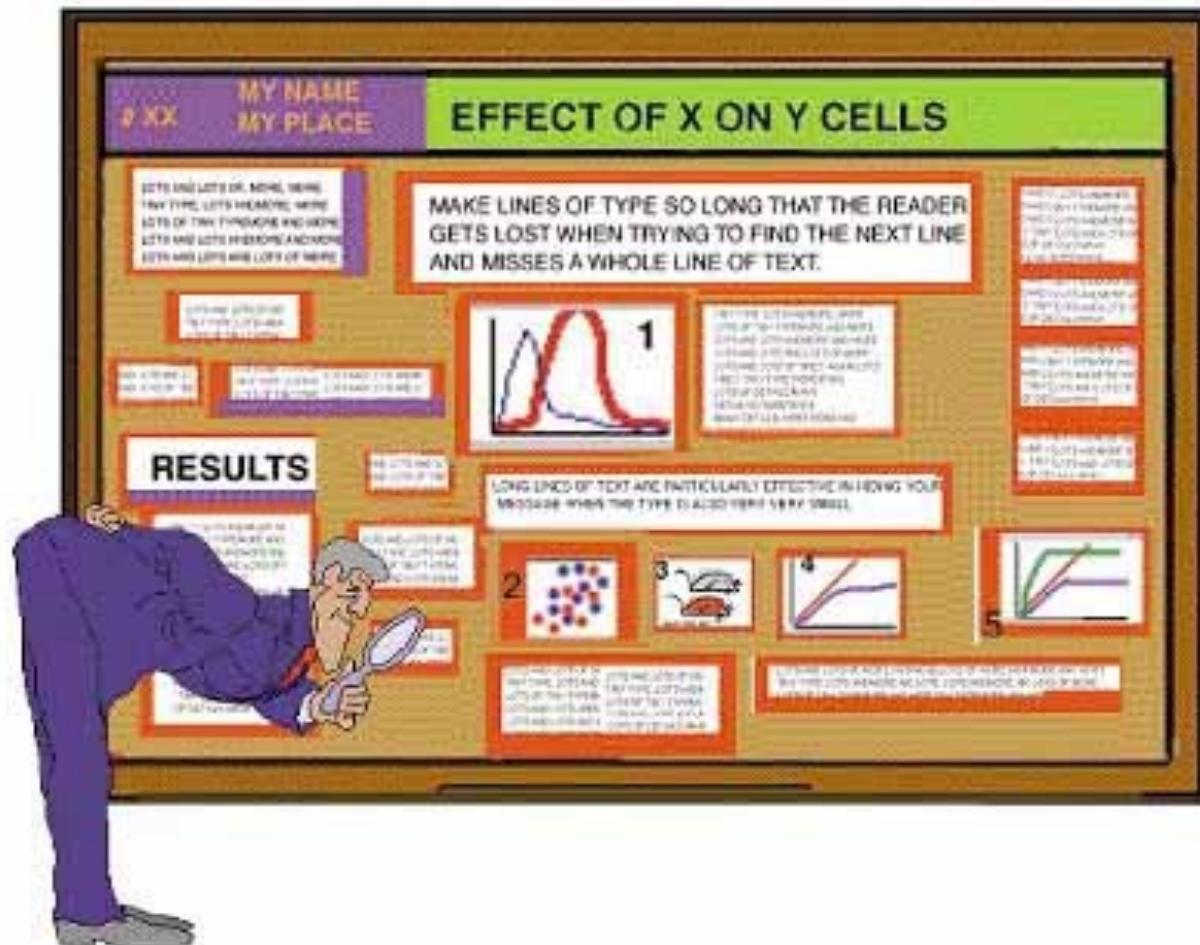


Utter  
chaos will  
make  
folks  
dizzy!

## This is the goal for easy reading



## Can anyone read your poster?





## Text sizes:

Title: **85 point**

Authors: **56pt**

Sub-headings: **36pt**

Body text: **24pt**

Captions: **18pt**

The image shows a template for a research poster. At the top, the Karolinska Institutet logo is displayed. Below it, the title 'Your Ingenious Teaser Right Here to Woo Them Down to the Body' is written in a large, bold, black font. A green arrow points from the text 'Title: 85 point' to this title. The main content area is divided into several sections: 'Conclusions first: 44 pt bold' (with a green arrow pointing from 'Authors: 56pt'), 'Introduction', 'Your aim', 'Your message', 'Layout, photos and print', and 'Handouts'. Each section contains descriptive text and small images. A large image of a human brain is centered in the middle-left of the poster. A green arrow points from 'Sub-headings: 36pt' to the brain image. A green arrow points from 'Body text: 24pt' to the text in the 'Layout, photos and print' section. A green arrow points from 'Captions: 18pt' to the text 'Always write a descriptive caption 18pt regular' located at the bottom of the poster. The bottom of the poster includes contact information for the University Library.

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

Themen und Beiträge 24pt 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. [textsize:: 34 pt 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 [Metakarta](#) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [Bildkarta](#). For more information: [www.bildkarta.kth.se](http://www.bildkarta.kth.se)

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.

Always write a descriptive caption 18pt regular

Uppslags och illustratörer  
Bildcaption 18pt regular

Kontakta Metakarta, 18pt regular  
Post och design, Biblioteket, Service  
Sekretariat  
Vilsky, Servicetekniker T  
Post, Apellus, IT, Bibliotek  
Telefon 08-513 12 20  
Fax 08-566 656 66

www.bildkarta.kth.se  
Metakarta, 18pt regular  
Bildcaption 18pt regular

www.bildkarta.kth.se  
Metakarta, 18pt regular  
Bildcaption 18pt regular

# Images and graphs say much more than words

## **BIG figures that use color**

# Keep posters visual!



**Introduction**

Southern flounder (*Paralichthys lethostigmus*) 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.

## Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Godwin and Russell Boeski  
Department of Zoology, Box 7517, North Carolina State University, Raleigh, NC 27695



**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 kept exposed to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were reared from a natural diet of Artemia nauplii to high protein pelleted feed and fed until initiation 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 temperature (18, 23, or 28°C) for 245 days.
- Carcasses were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

**Histological Analysis**

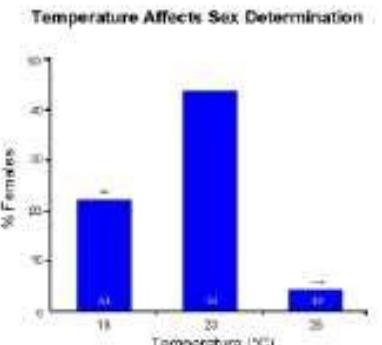


Male Differentiation



Female Differentiation

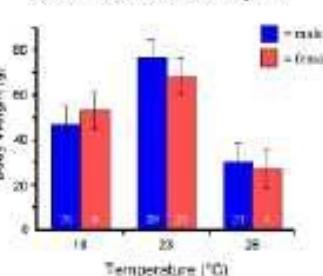
**Temperature Affects Sex Determination**



Temperature (°C)	% Females
18	~22
23	~44
28	~10

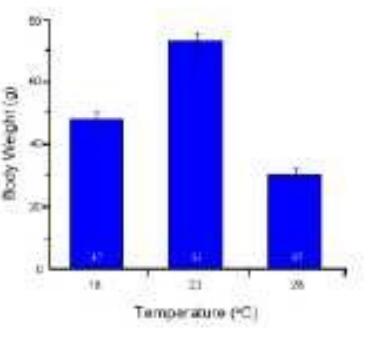
$^{*}P < 0.01$  and  $^{***}P < 0.001$  represent significant deviations from a 1:1 male:female ratio.

**Growth Does Not Differ by Sex**



Temperature (°C)	Male (g)	Female (g)
18	~45	~48
23	~75	~72
28	~35	~32

**Rearing Temperature Affects Growth**



Temperature (°C)	Body Weight (g)
18	~45
23	~75
28	~35

**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 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 fastest 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 Advanced Research Program of the National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Dr. William Barth Native for help with the work.

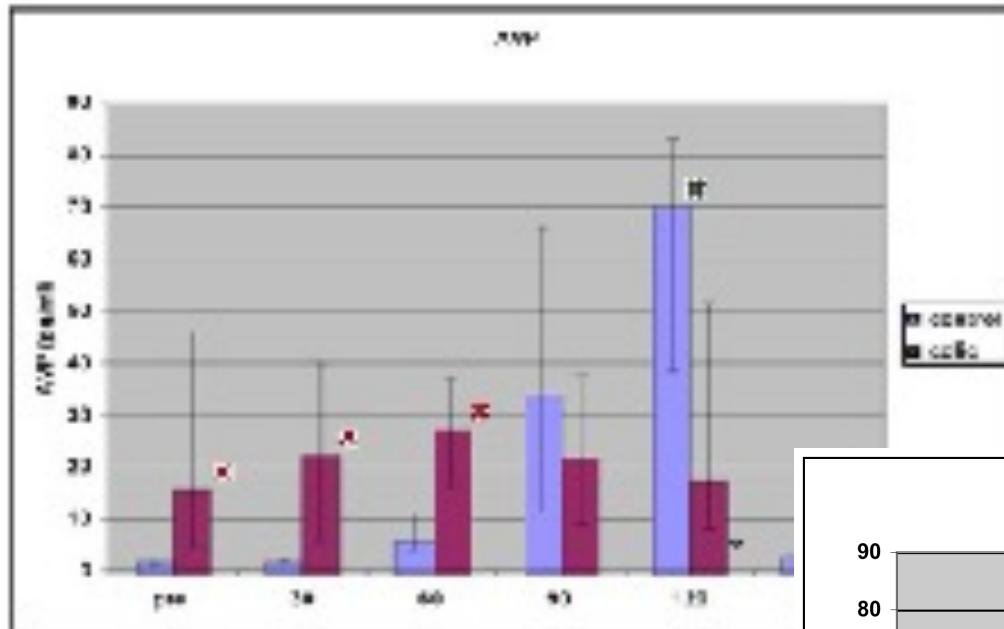
## Picture perfect photos

- 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 72 dpi

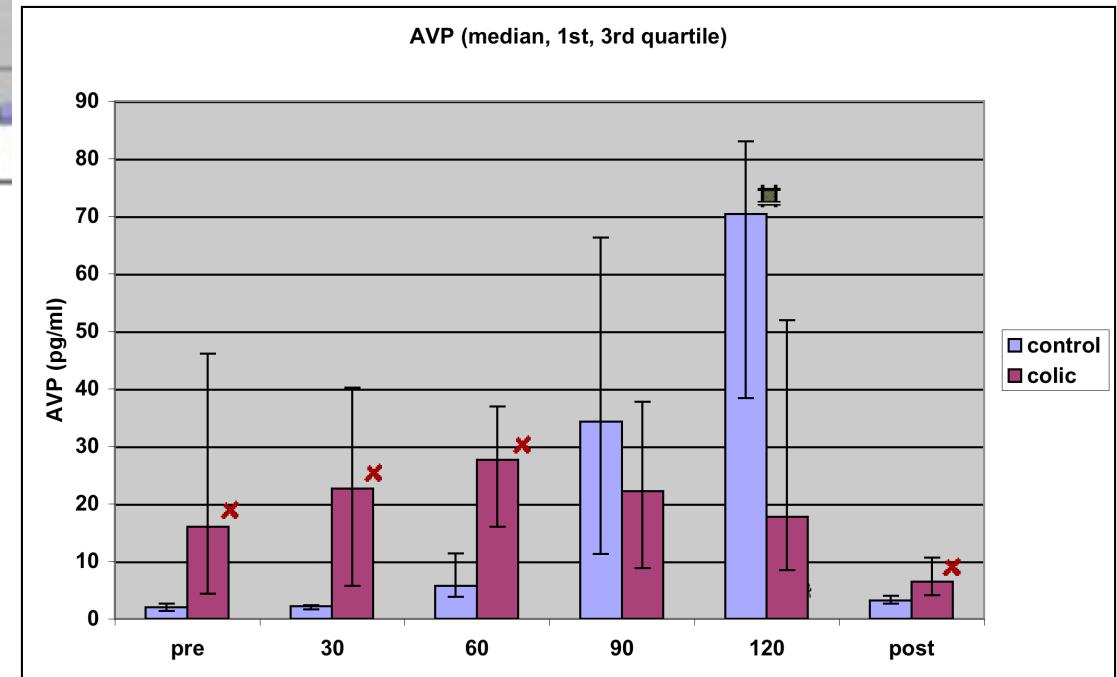


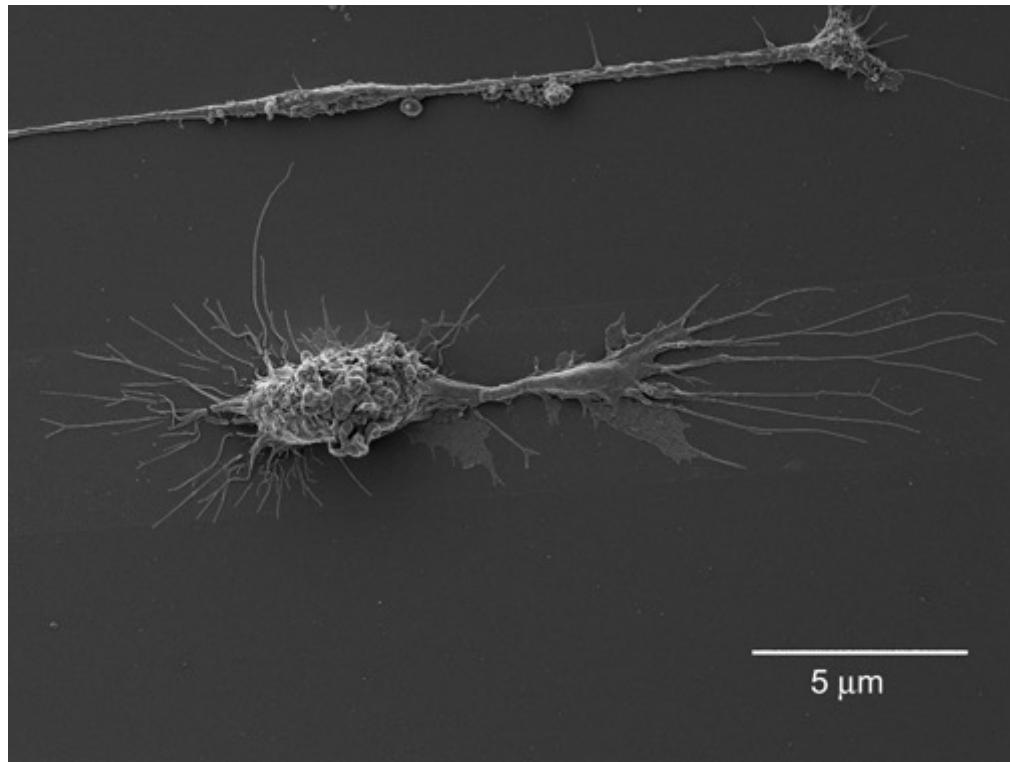
Line art is best displayed as a “png”

jpg (not as crisp)



png





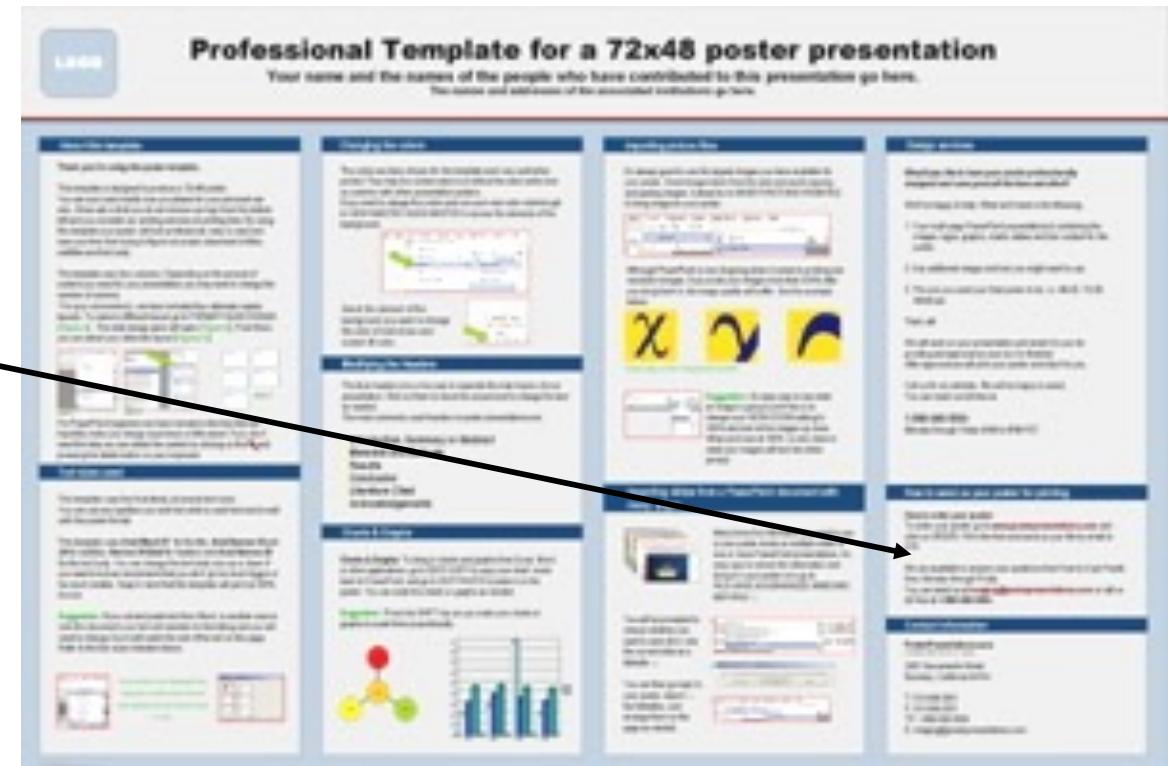
Your cool images  
mean nothing  
without a  
scale bar or  
description

This is a biological something that is...



# Don't forget your funding acknowledgements

Eng, ECE, BME, etc  
Your department can  
provide you with the  
required wording



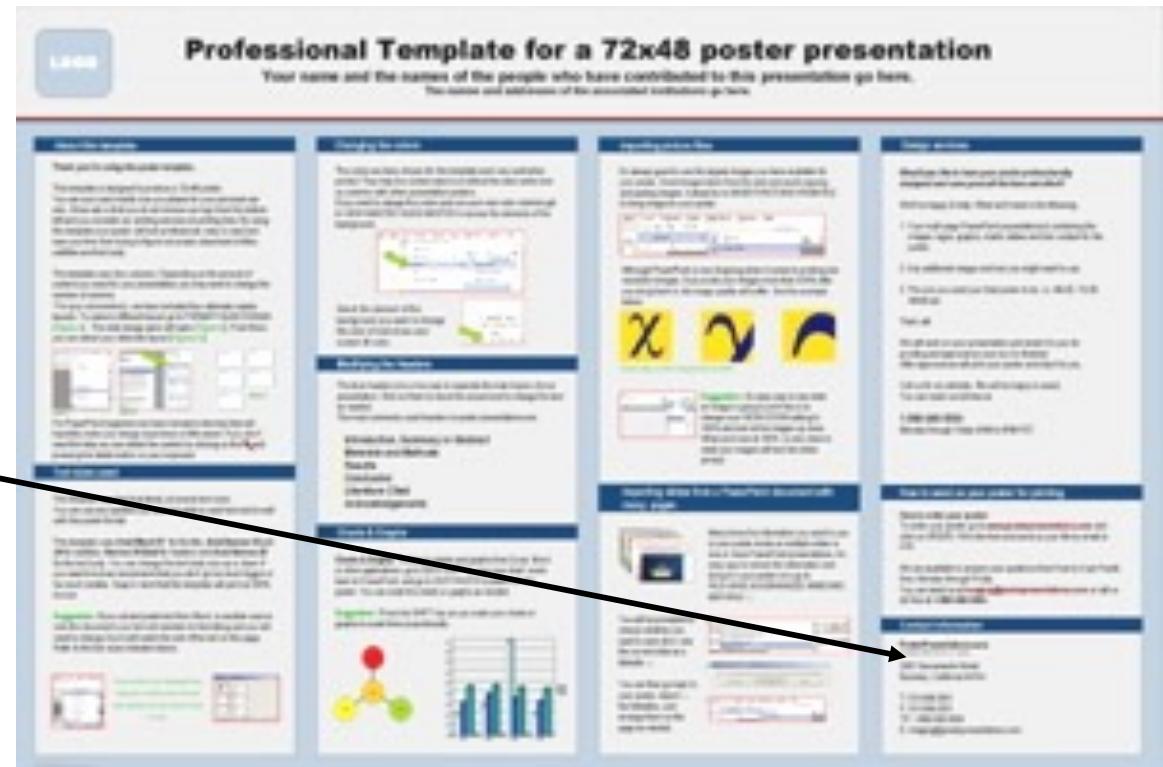


## Your contact info!!!

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



# 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**

Blah...  
 Check with conference organisers on their specifications of display character before you print your poster by medium poster size/landscape portrait square.  
 The size of your poster should be A0 (84.1cm) landscape (horizontal) format. Do not change the pages. You can scale up a smaller or larger document when printing. You must not alter margins, and when printing, you must not alter orientation (horizontal or vertical) of a square poster template.  
 Bear in mind you do not need to fill up the whole poster template by some conference organisers (e.g. 80% of the USA). Don't make your poster bigger than necessary just to fit in.

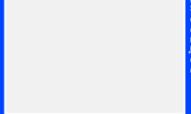
Check with conference organisers on their specifications of display character before you print your poster by medium poster size/landscape portrait square.  
 The size of your poster template is A0

**Aims**

Blah...  
 Check with conference organisers on their specifications of display character before you print your poster by medium poster size/landscape portrait square.  
 The size of your poster template is A0

**Method**

Blah...  
 Tips to making a successful poster ...  
 • Rewrite your paper in poster format. Simply writing and do not overdo.  
 • Headings on your poster should be in upper and lower case, not capitals.  
 • If you have double sentences in capitals or use them to stress your purpose, use bold characters instead.  
 • When laying out your poster leave breathing space around your text. Don't overcrowd your poster.  
 • Try using photographs or colour graphs / avoiding numerical tables.  
 • Spell check and get someone else to proofread.



Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...



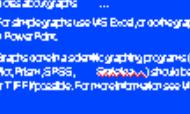
Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...



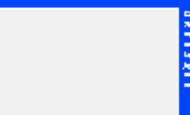
Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...

**Results**

Blah...  
 Images such as photographs, graphs, diagrams, logos, etc. can be used on your poster.  
 To print your poster you must go through the following steps: Open your Poster File in the folder on your computer, select print and press OK. The best way to print your poster is to save it as JPEG or TIFF. JPEG is the preferred format.  
 Beware: other images may be your own property. The average colour photo (3x 10x at 100 dpi) will be about 3Mb (1440x 960 pixels). Call MU Picture. Do not use images from the web.



Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...



Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...



Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...  
 Experiments on the ...

**Printing and Lamination**

Once you have completed your poster bring it down to MU for printing. We will provide A3 size paper. You need to print it on both sides. The final poster will then be printed and laminated.

It is recommended you print until 100mm from the edges of your poster. Allow a few working days before you need to use it. Simply highlight it and replace.

**Cost**

For poster printing and laminating charges contact MU.

**Conclusion**

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

**Contact**

Medical Illustration MU  
 Phone: 02 4221 2200  
 Email: [mu.pic@uow.edu.au](mailto:mu.pic@uow.edu.au)  
 Website: <http://mu.pic.uow.edu.au>

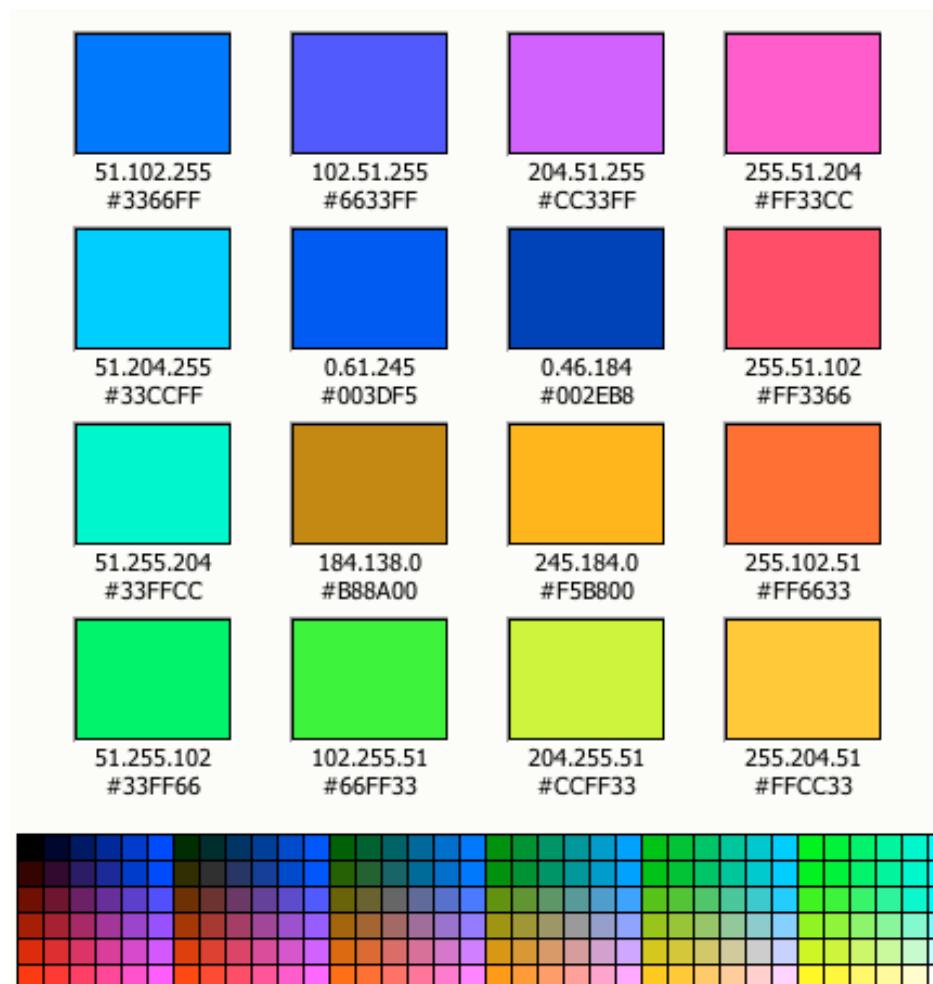
**Acknowledgements**

Just highlight it and replace with your own text. Replace it with your text.

This attracts attention but tires out the eye



## Be carefull 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.

## Be aware of busy backgrounds

**NC STATE UNIVERSITY**

### Snook Growth in Habitats with Differing Abiotic Variability

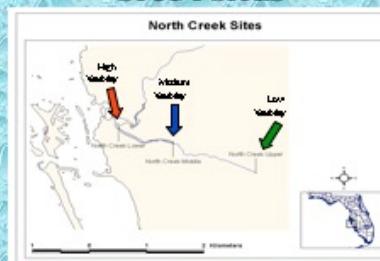
Alesia Read, North Carolina State University, [anread@unity.ncsu.edu](mailto:anread@unity.ncsu.edu)

**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

**STUDY SITES**



**METHODS**

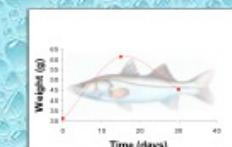
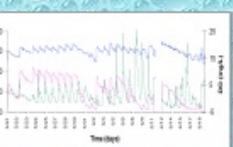


1. Juvenile snook are raised to fingerlings (100-200 mm) in the aquaculture facility
2. All snook are tagged with identifying markers for individual growth measurements
3. Fish are placed in cages within variable habitats at the research sites for 40 days
4. Fish are weighed and measured for growth

**RESULTS**

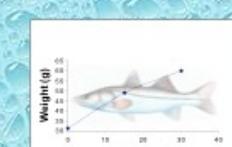
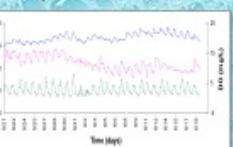
**North Creek Lower (High Variability)**

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

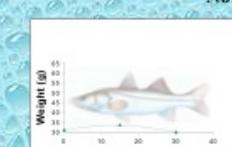
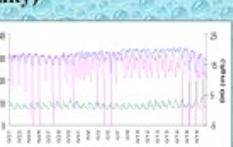
**North Creek Middle (Medium Variability)**

**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

**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**



This is an award winning poster, too the point, simple images, easy to read in a couple minutes.

**NC STATE CONFERENCE**

**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 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 broodstock were shipped spawns to collect eggs and sperm for in vitro fertilization
- Hatchery larvae were reared from a natural diet (infusoria) to high protein pelleted feed and fed until initiation at least twice daily
- Upon reaching a mean total length of 40 mm, the parent 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 (ovogenesis)

**Histological Analysis**

**Temperature Affects Sex Determination**

**Growth Does Not Differ by Sex**

**Results**

- Sex was discernible in most fish greater than 120 mm long
- High (28°C) temperature produced 9% 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, 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-moderating 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 8 year southern flounder.

**Acknowledgements**

The authors acknowledge the Advanced Graduate Program of the National Marine Fisheries Service at the University of North Carolina, the Great Lakes Program for Fish and Aquaculture, Special thanks to Dr. William D. Ritter for his support in figure 4.

**Figure 1: Temperature Affects Sex Determination**

Temperature (°C)	% Females
18	22
23	44
28	9

**Figure 2: Growth Does Not Differ by Sex**

Temperature (°C)	Male (Blue)	Female (Red)
18	45	48
23	65	62
28	30	28

**Figure 3: Rearing Temperature Affects Growth**

Temperature (°C)	Body Weight (g)
18	45
23	65
28	30

## A little background color added

**NC STATE UNIVERSITY**

### Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach\*, John Godwin and Russell Borski  
*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.

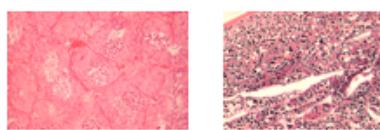
**Objective**

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

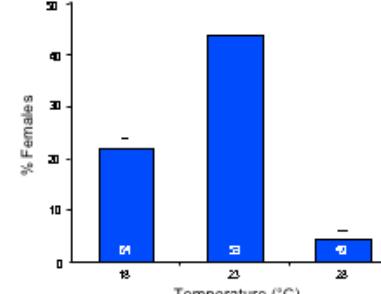
**Methods**

- Southern flounder broodstock were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were weaned from a natural diet to high protein pelleted feed 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**



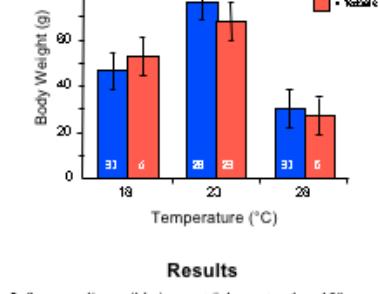
**Temperature Affects Sex Determination**



Temperature (°C)	% Females
18	22
23	44
28	4

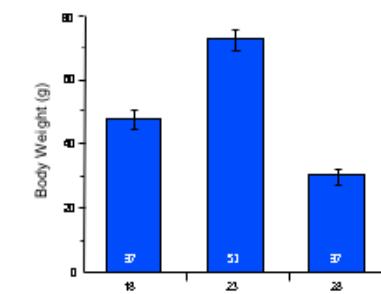
(\* P < 0.01 and \*\*\* P < 0.001 represent significant deviations from 1:1 male:female sex ratio)

**Growth Does Not Differ by Sex**



Temperature (°C)	Male (g)	Female (g)
18	45	55
23	75	65
28	30	25

**Rearing Temperature Affects Growth**



Temperature (°C)	Male (g)
18	45
23	75
28	30

**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.

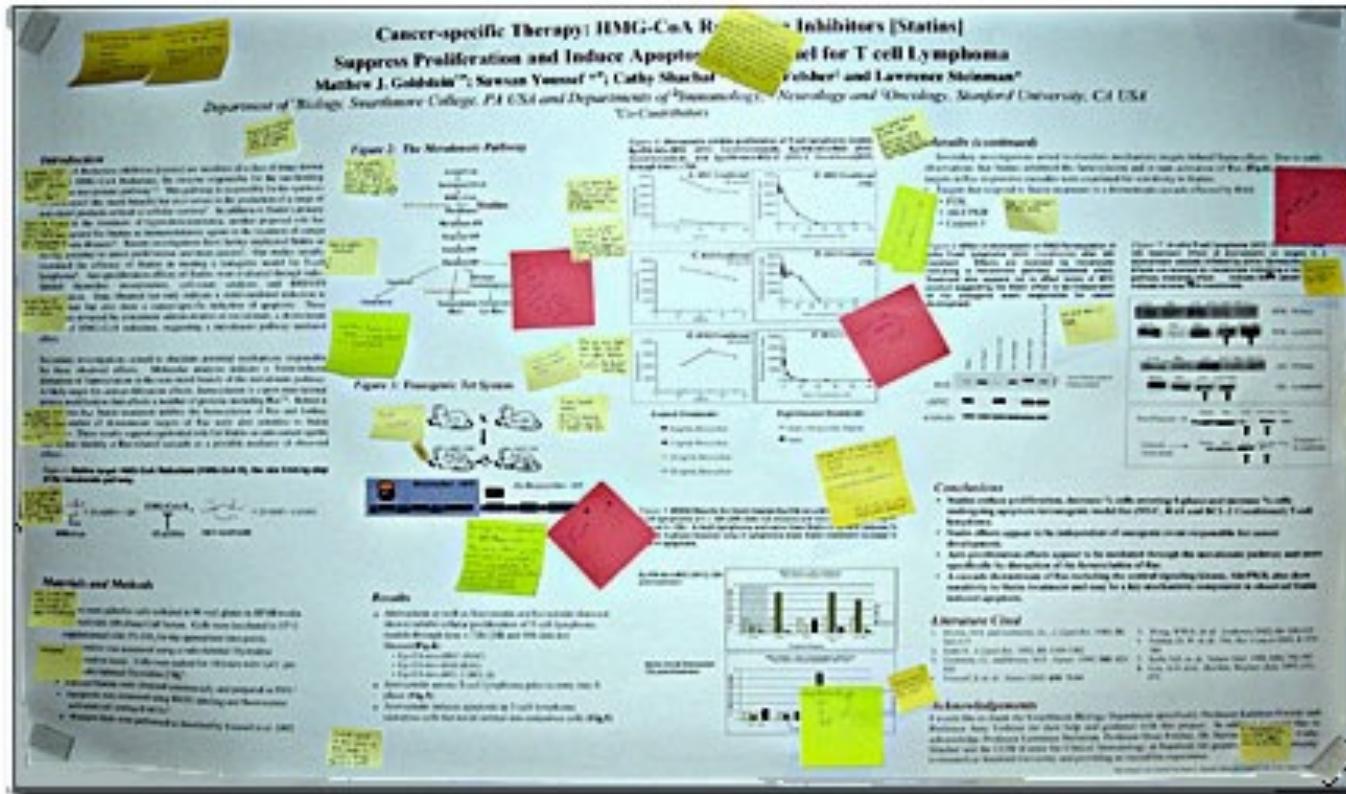
**Conclusions**

- 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 National Oceanic and Atmospheric Administration, National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding research specifically to Lee Wiers and Edna Rhyne for helping with work.

# Edit, Edit, Edit and Evaluate!



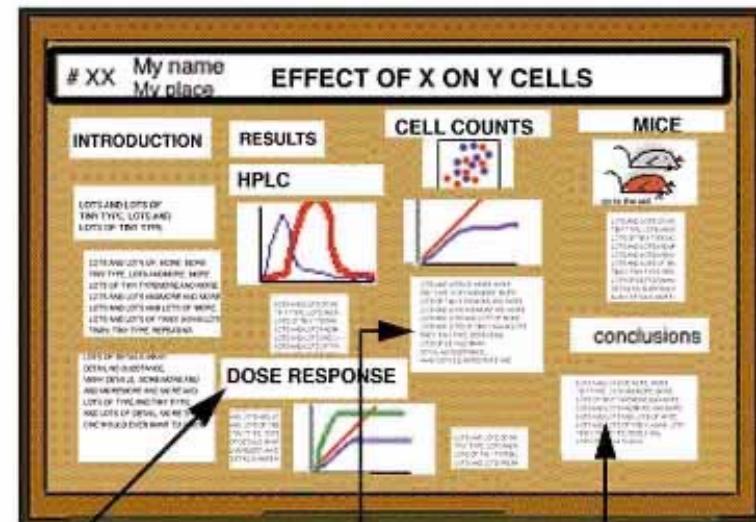
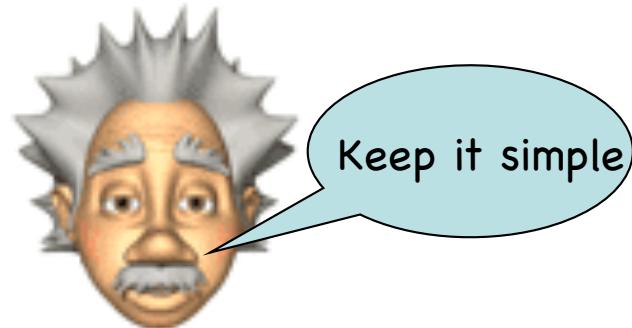
## Print out a letter size draft

Can you read the type?

Are these the colors you really want?

Does it look too busy?

Do my main points pop?



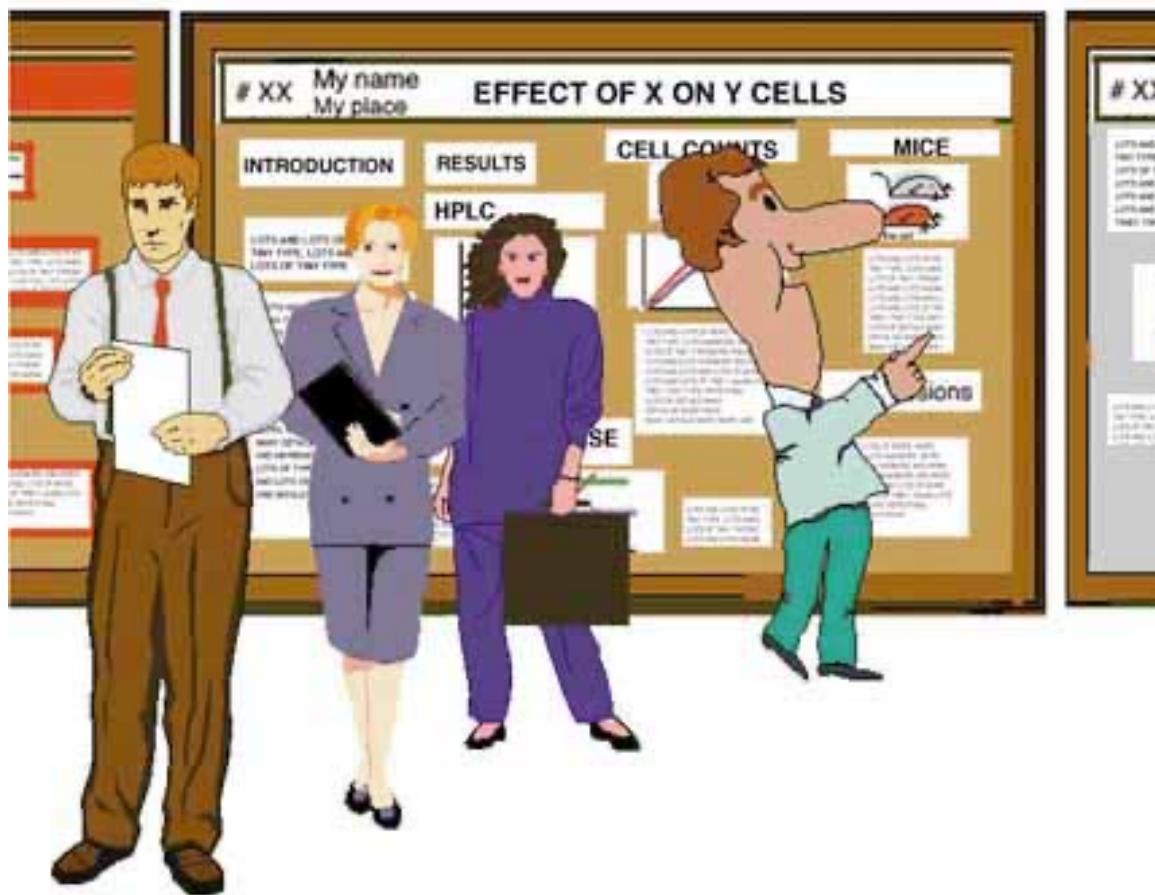
Large type  
states methods,  
not results

Results  
artfully buried in a  
methods description

Carefully  
omits  
interpretations

# You're not done yet...

Prepare a 3-5 minute verbal explanation



Is he ever  
going to  
SHUT UP???

## Prepare mini size poster handouts



- Provides a written record for interested folks
- Makes you look “smart”
- Be sure to include complete contact information
- Might even get you a job!



Let's judge some designs  
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>2</sup>, Jeff Bay<sup>3</sup>

### 1. Windbreaks as Habitat

Agricultural land — fields, pastures, and orchards — are managed to produce food and fiber for people. In the U.S. Great Plains, an agricultural landscape dominated by fields, pastures, and orchards protect birds, crops, livestock, and themselves from the prevailing winds. Windbreaks provide some of the same windbreak habitat for birds and animals that fields do not. Many native prairie species of birds and mammals occur in the fields, and many more value windbreaks as a habitat type. In the west, most birds value much of the other woody cover occurring along riparian corridors.

Although they protect soil 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 greater prairie chickens, upland sandpipers, and prairie antelope.

- ★ Early windbreaks were sampled using two-stage sampling with a frame stratified by intensity of cultivation.
- ★ Most sample windbreaks fall in or near native prairie.
- ★ Habitat characteristics of each windbreak were measured in 1994.
- ★ Thirty-six farmers allowed windbreaks to return in 1994.

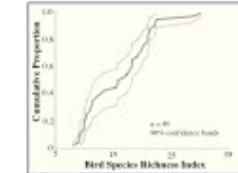
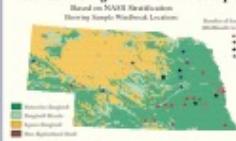
### 2. Regional Evaluation of Windbreaks

The Environmental Monitoring and Assessment Program's Agricultural Land Growth Project, charged with assessing the ecological condition of U.S. agricultural lands — undertook a pilot study to evaluate the value of windbreaks on a regional basis. We decided to use a bird species richness index to measure the habitat value of individual windbreaks.

We used the U.S. Fish and Wildlife Service's Bird Species Richness Index (BSRI), which estimates the number of breeding bird species a single windbreak can support based on four windbreak attributes:

- ◆ Area has the greatest impact on bird diversity; large windbreaks support more species. Area was measured by calibrated mapping.
- ◆ Height: Taller windbreaks provide more niches. Height was measured by photographic analysis.
- ◆ Vertical Structure: A more structurally complex windbreak provides more habitat niches. Measured by point sampling.
- ◆ Shape: Provide another habitat niche. Shape was constant.

### Nebraska's Agricultural Landscape



- ★ Using expansion factors associated with each sample, we estimated the habitat value of windbreaks for the region graphically.

- ★ We estimated that half of Nebraska's windbreaks support more than 10 breeding bird species graphically.

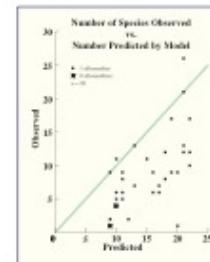
- ★ We also estimated that between 15% and 25% of all windbreaks in Nebraska (1.3 hectare) do not support any breeding birds. This suggests that few Nebraska windbreaks provide habitat for forest interior or area sensitive birds.

### 4. Validating BSRI Model

In 1994, a team of five ornithologists revisited 10 of the 40 windbreaks 15 times (allowing further visits) between late May and early May.

Each windbreak was visited four times. Data were collected between one-half hour before and four hours after sunrise. All observed birds were identified to species and recorded using spot mapping techniques. The order of visitation of the same windbreak was not played or final pass through the windbreak for each visit.

Because no windbreaks were missed, we assumed all species were detected.



### 5. Results of Validation

The model overestimated the number of bird species in the Nebraska windbreaks graphically. However, the relative qualitative ranking of windbreaks was generally preserved. A total of 31 species were observed.

For strong, significant relationships was found between deviation of observed from predicted number of species and (a) windbreak distance or (b) geographic location of individual windbreaks.

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

Openland and prairie 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 3-20 more species of bird than Nebraska (Breeding Bird Survey's species richness map of North America).

2) **Dependence on different windbreak characteristics.** The number of species in Nebraska's windbreaks depends differently on windbreak characteristics than did the number of species in Kansas.

3) **Dependence on 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 (160 acres), 65 ha containing the sample windbreak. Cover categories were tree, woodland, open grass, herbaceous, human (non-crop), and water. Forests and cattle grazing were also recorded (present/absent).

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

1) The Bird Species Richness Index for windbreaks cannot be extended simply to describe species richness at large regional scales without either recalculating regionally 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 public in windbreaks (e.g., 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, rather 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.

<sup>1</sup> North Carolina State University, Forestry Department, Raleigh, NC  
<sup>2</sup> University of Maine, Department of Wildlife Ecology, Orono, ME  
<sup>3</sup> North Carolina State University, Statistics Department, Raleigh, NC



A bit text heavy  
but not too bad.



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

P. Ottl, P. Schmelz, A. Piwowarczyk, H.-Ch. Lauer

Dept. of Prosthodontics, School of Dentistry (Director: Prof. Dr. H.-Ch. Lauer), ZMK (Carolinum), 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**:

  - Inadequate occlusal support
  - Increased occlusal loss of dental hard tissue

- for the **distraction splint sample**:

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

#### 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  
Spider® digital 8-channel measurement unit/Camus 32 software V2.1 (HBM, Darmstadt)  
Local coordinate storage for occlusal contacts during baseline measurements  
Ten measurements each in regions 13, 23, 16, 26 (BL, 4W, 3M, 6M)  
Splint repositioned on remount cast

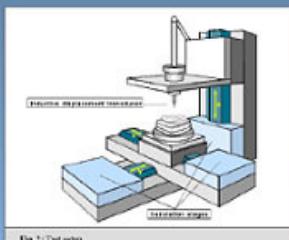


Fig. 2: Test setup

#### Results

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

### 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).

Fig. 2: Occlusal vertical gain/loss (mm) of the casts in situ over a period in situ of six months (n = 20 stabilization splints)

Region	13	23	16	26
Baseline	0.00	0.00	0.00	0.00
Posterior teeth	0.00	0.00	0.00	0.00
Anterior teeth	0.00	0.00	0.00	0.00

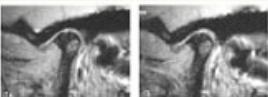
Fig. 3: Occlusal vertical gain/loss (mm) of the casts in situ over a period in situ of six months (n = 20 stabilization splints)

Region	13	23	16	26
Baseline	0.00	0.00	0.00	0.00
Posterior teeth	0.00	0.00	0.00	0.00
Anterior teeth	0.00	0.00	0.00	0.00

Fig. 4: Occlusal vertical gain/loss (mm) of the casts in situ over a period in situ of six months (n = 20 distraction splints)

Region	13	23	16	26
Baseline	0.00	0.00	0.00	0.00
Posterior teeth	0.00	0.00	0.00	0.00
Anterior teeth	0.00	0.00	0.00	0.00

Fig. 5a and b: Sagittal occlusal (upper) casts of the condyle/teeth relationship without splint. a) No splint with distraction splint inserted (Fig. 5b) following six months of wearing



Nice poster

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

George Hess<sup>1</sup>, Anne Hellkamp<sup>2</sup>, Mike Maunder<sup>3</sup>, Steve Peck<sup>3</sup>, Lee Campbell<sup>3</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.

**Sustainability**

**Sustainable agriculture** has been discussed, defined, and debated in countless papers. Definitions tend to be broad and ambiguous, ecological, economic, social, and even policy dimensions. Although these dimensions are interrelated, each may be examined independently. *In our efforts, we sought methods to examine only the ecological aspects of sustainability.*

**The ecological condition** of agricultural land is defined by its productivity and the degree to which valued biotic and abiotic resources are conserved and protected. *Agricultural land in good condition is productive and does not compromise valued resources. Sustainability is the ability to maintain good condition over time.*

**Productivity**

**Land Stewardship**

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

**Potential Indicators for Annually Harvested Herbaceous Cropland**

As a working point, we chose to examine our efforts in 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 hayseeds.

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 Natural Resource Inventory data.

**Field Index** soils as if crop yields for sowing expectation based on soil, climate, weather, and management.

**Crop-Risk Index** the risk of future pest and disease outbreaks.

**Field Condition Index** reflects the diversity of soil and may serve as an early predictor of changing environmental conditions.

**Field Condition Index** may reflect the ability of soil organisms to cycle nutrients.

**Crop** rain, soil, and atmosphere.

**Fragmented Outputs** farmer inputs.

**Farmer inputs** application of ecological knowledge to reduce pesticide use.

**Atmosphere** a crop source that uses energy to produce and apply. Excess N can become a pollutant.

**Farmer inputs** application of biodegradable particles to beneficially treat a threat to water quality.

**Soil** soil organisms, physical, chemical, and biological ability of soil to provide the air, water, and nutrient plants need to grow.

**Soil Health Index** reflects physical, chemical, and biological ability of soil to provide the air, water, and nutrient plants need to grow.

**Soil Report Card** indicates physical, chemical, and biological ability of soil to provide the air, water, and nutrient plants need to grow.

**Crop Diversity Index** a more diverse agricultural landscape is less vulnerable to stresses, including pest and disease outbreaks.

**Extent of PPM** integrated management applies ecological knowledge to reduce pesticide use.

**Atmosphere Use Efficiency** a crop source that uses energy to produce and apply. Excess N can become a pollutant.

**Atmosphere Use Efficiency** a crop source that uses energy to produce and apply. Excess N can become a pollutant.

**Non-crop Vegetation Diversity** non-crop vegetation supports wildlife that might otherwise perish in an agricultural landscape.

**Field Edge Disturbance** a trend of increasing field size signals loss of non-crop vegetation and associated wildlife habitat, and may be expected to increase erosion by wind and water.

**Fields are for crops . . .**

**. . . but landscapes are for all of us.**

**Acknowledgements:** The EMAP Agricultural Lands Resource Group thanks the many individuals and organizations that made this effort a success. The individuals are too numerous to mention, but include the USDA Agricultural Research Service, Forest Service, National Agricultural Statistics Service, and Natural Resource Conservation Service; the U.S. Environmental Protection Agency, North Carolina State University, University of Maine, Oregon State University, University of Nebraska, and, well, I 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 Natural Resources Conservation Service, Raleigh NC  
5. USDA Agricultural Research Service, Raleigh NC

28 March 1997



Where do I begin?



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

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

**Background:** Obesity is a major clinical and public health problem facing children and adolescents in the USA. Of particular significance is the increasing prevalence of obesity and its complications among the Latino population. Among this ethnic group there is a strong sense of family, and children are a priority. Because of the pressures placed on children, there may be a misplaced assumption that children should not be denied food or other basics such as TV. Obesity in children and adolescents is increasing not only because of the associated health and psychological complications, but also because obese children tend to become obese adults. Since obesity is associated with many chronic diseases, it will have an enormous impact on the health care system.

**Purpose of Study:** To estimate the extent of obesity among inner city Latino children and adolescents (0-18) the overall goal of assessing the need for an obesity intervention program.

**Study Design:** One hundred and twenty five charts of children and adolescents aged 0-18 years were randomly selected from well-child visits to Children's Hospital's Adams Morgan Clinic for the calendar year 2000. The charts were an average of 300/750 patients a month, approximately 90,000/yr are Latino, predominantly from DC/SWDC. Information extracted from the charts included weight, height, blood pressure. X-ray classification, history and physical findings concerning willful obesity complications. Body Mass Index (BMI) was calculated from measured weight and height. This analysis was done using SAS version 8.1.

**Results:** The distribution of the study sample is shown in Table 1. About 50% were females. The mean age was 10.4 years with a SD of 3.9 and a range of 0.0 to 16.7 years. The mean BMI was 20.8 with a SD of 3.8 and a range of 13.5-47.8. Overall, 40% of the children and youth were overweight (BMI > 95th percentile) or at risk for overweight (BMI = 85-95th 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 higher for youth ages 10 to 14 years.

**Results continued:** Table 3 shows the distribution of overweight and at risk for overweight by age category. These data show that prevalence of overweight and at risk for overweight is high in children as young as 6 to 8 years. Although the prevalence of overweight and at risk for overweight was lowest in the age group 6-8 years, the differences were not statistically significant (Fisher's Exact Test p=0.81 and p=0.60, respectively).

Adolescent frequency was higher among the overweight than the non-overweight children and youth ( $p<0.008$ , Fisher's Exact Test). There was no difference in the frequency of occurrence of other symptoms such as obstructive sleep apnea, learning difficulties, behavior problems, insomnia, and ADHD between the overweight and non-overweight group. Only 2% of all the overweight children had their cholesterol levels checked. The cholesterol levels ranged from 112-1190 mg/dL. Two percent of the children had their serum triglyceride measured, and the range was 173-1779 mg/dL. There was no significant association between overweight and systolic or diastolic blood pressure in this small sample. Only 20% of the overweight children and youth were diagnosed and notification made to their charts regarding their overweight status by their health care providers. There were no referrals for overweight intervention noted in their charts.

**Table 1 - Population analysis**

Variable	Frequency %
Gender	50.4
Male	50.4
Female	49.6
Age Category (years)	Frequency %
0-5	4.8
6-8	20.4
9-11	27.4
12-14	24.8
15-19	18.8
14-18	12.8
16-18	9.2

**Table 2 - BMI distribution**

BMI Category	Frequency %
All BMI for overweight (BMI > 95 <sup>th</sup> Percentile)	20.8
1. Both Sexes (n=125)	23.4
2. Males (n=60)	29.1
3. Females (n=65)	22.8
Overweight (BMI > 85 <sup>th</sup> Percentile)	24.1
1. Both Sexes (n=125)	24.1
2. Males (n=60)	20.9
3. Females (n=65)	26.9

**Table 3 - All BMI for Overweight and Overweight by Age Category**

Age Category (n=125)	All BMI for Overweight (%)	Overweight (%)
(n=60)	(n=65)	(n=65)
0-5	30.0	30.0
6-8	28.4	21.4
9-11	9.3	16.2
12-14	36.7	27.8
15-19	24.9	25.9
14-18	25.0	26.3
16-18	26.0	26.0

**Conclusion & Recommendations:** The prevalence rate for overweight and at risk for overweight among children and youth in this inner city Latino community is more than twice the national average. Primary health care providers must be acknowledge and discuss the presence of obesity and overweight in children and adolescents 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 Osteoporotic Vertebral Body Compression Fractures (VCF)**

Steven R. Garfin<sup>1</sup>, M.D., Isidor H. Lieberman<sup>2</sup>, M.D., Mark A. Riley<sup>3</sup>, M.D., Joseph M. Lane<sup>4</sup>, M.D., Frank M. Phillips<sup>5</sup>, M.D., Hallett S. Mathews<sup>6</sup>, M.D., Hansen A. Yuan<sup>7</sup>, M.D., Burton H. Sacha<sup>8</sup>, M.D., for the Kyphoplasty Study Group  
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**BACKGROUND**

- 300,000 VCFs per year
- 275,000 diagnosed, 160% due to pain
- Spinal deformity associated with:
  - Significant morbidity
  - 22% increased mortality (Kado, Ann Int Med 1999)
- Current treatments ineffective:
  - Open surgery fail
  - Medical management palliative
- Vertebroplasty:**
  - Bilateral transpedicular cement fill
  - Relieves pain
  - Requires high pressures and runny cement
  - High risk of cement leak
    - Up to 73% when documented (Mirel et al., Radiology 1997)
  - Major complications (Orchec, J Int Neurosci 1997)
    - 1.3% in subarachnoid
    - 10% in metastatic cancers

**KYPHOPLASTY**

Kyphoplasty is a minimally invasive orthopaedic procedure for reducing and fixing painful vertebral body compression fractures secondary to osteoporosis. Using a posterior approach, one or two Inflatable Bone Tampons (Fig. 1) are inserted into the fractured vertebral body, generally using a bilateral transpedicular approach (Fig. 2). The surgeon carefully inflates the balloon tampon (Fig. 2) using radiopaque contrast medium with image, volume and pressure control. The increased balloon tampon 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 tampon is removed, and the resulting void is filled with thick PMMA under fine manual control and low pressure. The steps of Kyphoplasty are illustrated in Fig 3.

Fig. 1. Kypho™ Inflatable Bone Tampon (IBT)

Fig. 2. External Transpedicular Fracture Reduction with the IBT

Fig. 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 marrow edema and collapse was confirmed on MRI. General or deep local anesthesia was chosen based on anatomy, number of levels and patient status. The first 150 patients at our centers were asked to characterize their back pain as improved, the same or worse 24 hours post-op and at least follow-up. Fractured and nearest normal vertebral body heights were measured anterior, midline 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 there had not lost 10% or more of height before treatment (Fig. 4B).

Figure 4A. Percent of Predicted Height Pre- and Post-Kyphoplasty (n=150)

Pre-Op	Post-Op
100%	100%
90%	90%
80%	80%
70%	70%
60%	60%
50%	50%
40%	40%
30%	30%
20%	20%
10%	10%
0%	0%

Figure 4B. Percent of Predicted Height Pre- and Post-Kyphoplasty in Fractures With > 10% or Greater Compression

Pre-Op	Post-Op
100%	100%
90%	90%
80%	80%
70%	70%
60%	60%
50%	50%
40%	40%
30%	30%
20%	20%
10%	10%
0%	0%

**PRELIMINARY RESULTS**

150 patients (Table 1)

- Average height 5.6 inches
- Range 1.0 to 12.7 inches
- 60% women
- 54 patients (Table 2)
- Average 61 months
- Average age 61 years
- Average height 5.6 inches (range 3.0 to 12)
- Average low back pain 3.0 (range 3.0 to 6)
- More than 50% improvement in pain
- Most improved
  - 100% upper back pain relief
  - 88-98% reduction of low back pain (Figs. 4A, 4B, 5B)
- No increased incidence of adjacent lesions
- 100% device-related complications
  - Unrelated
    - 1 fracture
    - 1 laminectomy
    - 1 bleeding
    - 1 death
  - Device-related complications
    - 1 neurological
      - 1 fracture
      - 1 laminectomy
      - 1 bleeding
      - 1 death
- 0% device-related complications

Figure 5A. Kyphoplasty Induced Correction in 21 cases, including anterior (17) and Posterior (4) Approaches

Figure 5B. Kyphoplasty Induced Correction in 21 cases, including anterior (17) and Posterior (4) Approaches

Figure 5C. Kyphoplasty Induced Correction in 21 cases, including anterior (17) and Posterior (4) Approaches

Figure 5D. Kyphoplasty Induced Correction in 21 cases, including anterior (17) and Posterior (4) Approaches

**CONCLUSIONS**

Kyphoplasty is an important treatment option that provides immediate mobility 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 (less months or less), it has been seen in fractures over one year old. Kyphoplasty also provides rapid pain relief in 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  
copy needs  
to be cut!



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 specific rules and checklist before you submit your paper (e.g. maximum poster size, landscape or portrait orientation).

The suggested poster template is A0 (84.1cm x 118.9cm), landscape (horizontal) and does not change the page size. You can scale it to a smaller or larger size when printing. You need a clear relationship with either a portrait (vertical) or a square poster template.

Bear in mind you cannot exceed the page size allocated by some conference organizers (e.g. 80cm x 60cm in the USA). Don't make your poster bigger than necessary (and not smaller).

## Aim

How does this poster template ...

Simply highlights text and replace it with your own text. Copy and paste your text into a MS Word document to have a PowerPoint presentation.

The box boundaries should be between 25 and 32 pixels thick, in white or black.

Keep your text aligned to the left. The color of the text, font and paper background can be changed to your choice.

## Method

Top tips for making a successful poster ...

- Rewrite your paper in poster format. Is it simply a meeting, and does it still?
- Headings and certain words should be in upper and lower case, not all capitals.
- Have a clear distinction in capitals or lowercase across your poster - bold characters help.
- When laying out your poster leave breathing space around your text. Don't overcrowd your poster.
- Try using photographs or colour graphics. Avoiding numerical tables.
- Spell check and get someone else to proofread.



## Results

Importing/Inserting files ...

Images such as photographs, graphs, diagrams, logos, etc. can be added onto your poster.

To import scanned images into your poster go through them and adjust them. Right Click on File > Import > Import into your computer > Select > Open OK. The best type of image file to use are JPEG or TIFF. JPEG is a compressed format.

Beware - other image types and importing. The average colour photo (12 x 8cm at 100 dpi) would be about 1.1MB (1MB for BW grayscale). Call MU before.

Do not use images from the web.

### Icons

For simple graphs use MS Excel or photograph directly in PowerPoint.

Graphs can be in a scientific graphing program (e.g. Sigma Plot, Prism, SPSS, ...). Just save as JPEG or TIFF (possible). For more information see MU.

### Icons

For simple graphs use MS Excel or photograph directly in PowerPoint.

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For simple graphs use MS Excel or photograph directly in PowerPoint.

## Printing and Laminating

Once you have completed your poster using know how MU for printing, MU will produce A3 size prints for you to check and proofread. The final poster will then be printed and laminated.

From Monday to Friday until 12.30pm. Allow about 2 working days before you need to use it.

Simply highlight text and replace.

### Icons

For poster printing and laminating charges contact MU.

## Conclusion

For more information

Paper Design, Scanning and Digital Photography, and Images (MU).

Contact

Medical Illustration Unit  
Princo/Miles & capital  
Phone 0322300  
Email: [refugees@msu.edu.au](mailto:refugees@msu.edu.au)  
Webpage: <http://msu.edu.au>

## Acknowledgements

Just highlight text and replace with your own text.  
Replace it with your text.



Perfect!



Oh my gawd!







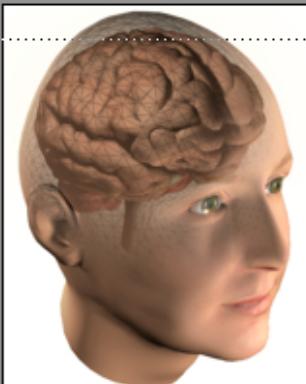
## Your Ingenious Teaser Right Here to Woo Them Down to the Body

Always write a descriptive caption 24pt 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. **textsize: 34 pt regular**



Always write a descriptive caption 24pt 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 [Mediavagn](#) at University Library for help with layout and image enhancement. For printouts and professional photographers contact [Bildverkarna](#). For more information: [www.bildverkarna.vith.se](http://www.bildverkarna.vith.se)



Always write a descriptive caption 24pt regular



Always write a descriptive caption 24pt regular

Always write a descriptive caption 24pt regular

**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)

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Medical College of Pennsylvania-Hahnemann University

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

## INTRODUCTION

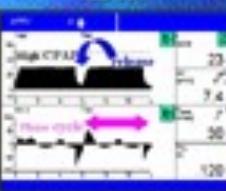
Airway Pressure Release Ventilation (APRV, aka. BIPAP) has been previously demonstrated to be a useful modality to manage patients with acute lung injury (ALI) or the acute respiratory distress syndrome (ARDS). As this is a fundamentally different mode than conventional cyclic ventilation, we reviewed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

## METHODS

Consecutive patients transitioned from either volume or pressure targeted ventilation to APRV (Dräger Evita 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 ( $\text{pO}_2 \leq 60 \text{ torr}$  on  $\text{FIO}_2 \geq 0.9$ ) were a  $\text{P}_{\text{high}}$  at the prior plateau pressure, a  $\text{T}_{\text{high}}$  of 6.0 sec and a  $\text{T}_{\text{low}}$  of 0.8 sec. Hypercarbic ( $\text{pCO}_2 \geq 55 \text{ torr}$  and  $\text{pH} \leq 7.3$ ) patients were set at a  $\text{T}_{\text{high}}$  of 5.0 sec and a  $\text{T}_{\text{low}}$  of 1.0 sec. Settings were adjusted to resolve hypoxemia and hypercarbia. IRB approved abstracted data included principal diagnoses, ventilation 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  $p < 0.05$  (1).

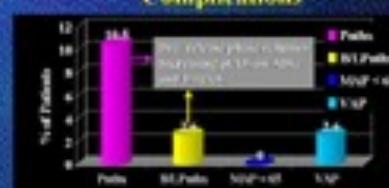
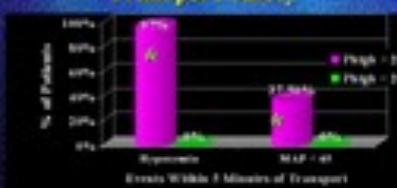
## RESULTS

## Demographic



Element	Value
% Hypoxemia	88%
% Hypercarbia	12%
Time to $SO_2 \geq 92\%$	7 ± 4 min
Time to $EtCO_2 \geq 0.6$	5.2 ± 0.9 hr
Time to $pCO_2 \geq 40$ mmHg	42 ± 7 min
Time to max $\Delta pCO_2$	76 ± 12 min
Mean change in $V_t$	-3.3 ± 0.9 L/min

## Transport Safety



## CONCLUSIONS

1. APRV is a safe rescue mode for hypoxic 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  $P_{sys}$  required for oxygenation and ventilation. Patients requiring a  $P_{sys} > 20$  cm H<sub>2</sub>O 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...



This  
works!

# LiLynn Graves

College of Engineering Webmaster

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