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Data, Data Everywhere: But Not a Drop to Analyze

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Data, Data Everywhere....



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May 20, 2011



DISCLOSURE

I have no actual or potential conflict of interest in relation to this program or presentation.

Abundance of clinical data



Diligent data entry

- ◆ Quality improvement
- ◆ State/national mandate
- ◆ Billing/coding



Patients and data yield research ideas



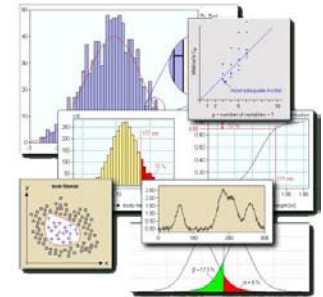
“We are charting clinical data anyway so why not put it in a database?”

“The data exists so why not analyze it?”

As the saying goes....



Data, entry, & analysis don't always flow



Not everything is as easy as it seems



UMass Trauma Registry

- ◆ 20+ years
- ◆ Prospective data collection
- ◆ Demographic, clinical, and outcome variables
- ◆ >40K records
- ◆ Ready for analysis and publication
- ◆ Not utilized previously for lack of time

Patient Quality and Outcomes Research Tools

A New Paradigm in Trauma Registry

Introducing TraumaBase 7.0

*A revolutionary revision in Trauma Registry Software.
Making the most of technology
while remaining true to the day-to-day rigors
of the Trauma Registry professional.*

Often imitated but never surpassed!

Once again, TraumaBase with Version 7.0
raises the bar to which all other registries can only hope to



Early research plans

- ◆ Three study questions
- ◆ Three abstracts/manuscripts by end of year
- ◆ Facilitate research by colleagues using same data

Some examples of what I found



Data, data everywhere....

- ◆ Examine mortality patterns

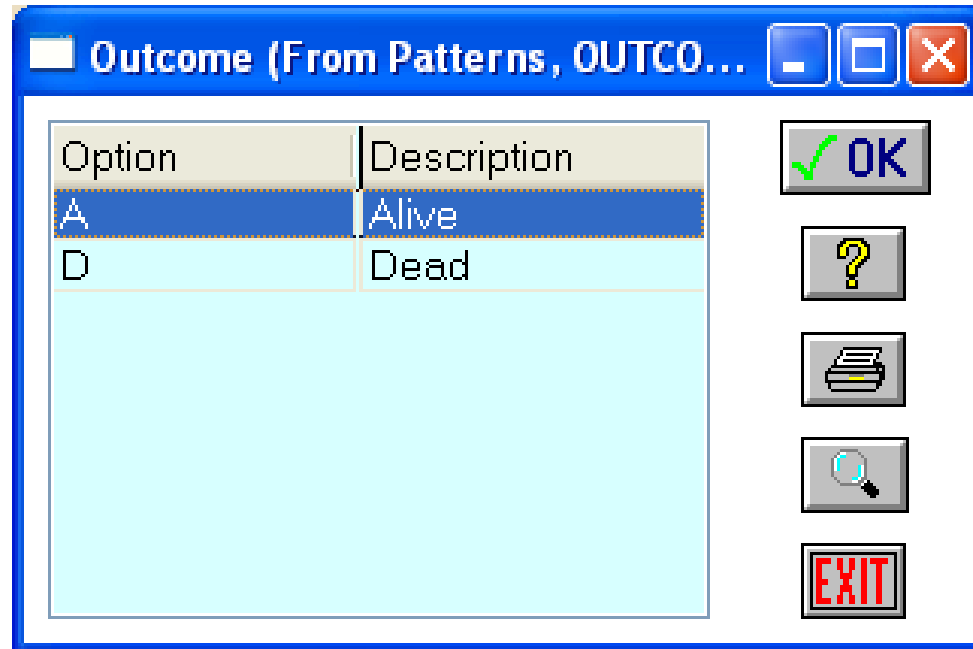


....Not a drop can be analyzed

◆ Mortality variable?



Trauma Registry Outcomes Screen



Generate new variable = Died

Died = 1 if outcome = D

Died = 0 if outcome = A

Data, data everywhere....

- ◆ Adjust for co-morbidities



....Not a drop can be analyzed

◆ Co-morbidity variable



Trauma Registry Co-morbidities Screen

The screenshot shows a software window titled "Comorbidities" with a table of options and descriptions. A yellow box highlights the first 18 rows of the table. To the right of the table is a vertical toolbar with icons for OK, help, print, search, zoom, list, and exit.

Option	Description
BACK	Backseat passenger
CALIBER	Caliber of bullet
DASH	Dashboard damage
DEFORM	Major external vehicle damage
EJECT	Ejected out of enclosed vehicle
FATAL	Death of same car occupant
FRONT	Front seat passenger
HEIGHT	Height of fall (in feet)
MED	Medical problems: MI;CVA;COPD;cancer;diabetes
PEDES	Speed of vehicle which struck pedestrian
PREG	Pregnancy
ROLL	Vehicle Rollover
SELF	Self inflicted injury
SPEED	Vehicle speed (not pedestrian injuries)
STEER	Steering wheel damage
THROWN	Distance thrown (pedestrian;bicyclist;motorcyclist)
TRAP	Extrication time (in minutes)
WIND	Windshield damage: "starring"
Angina p	History of angina within past 4 months
Ascites	Ascites within 30 days
Bleeding	Bleeding disorder
Chemo	Chemotherapy for cancer within 30 days
Congenital anomalies	Congenital anomalies
Congestive HF	Congestive heart failure
CVA w/deficit	CVA with residual neurological deficit

Data, data everywhere....

- ◆ Abbreviated Injury Scale (AIS)
 - Standardized injury terminology
 - Facilitate comparisons of injury studies
 - Rank injuries by severity
 - Describe injuries anatomically



....Not a drop can be analyzed

AIS Region	
Head/Neck	Includes C-spine
Face	Facial skeleton, nose, mouth, eyes, ears
Chest	Included T-spine and diaphragm
Abdomen	Includes pelvic contents and L-spine
Extremities	Includes pelvic skeleton
External	Abrasions, contusions, superficial injuries

AIS Code	Injury
0	Not Injured
1	Minor
2	Moderate
3	Serious
4	Severe
5	Critical
6	Fatal
9	Not further specified

Trauma Registry AIS Body Region Screen

Body Region (From Patterns, REGION) <AREA >

Code	Description
9	Unspecified
ABD	Abdomen/PMC Contents
ARM	Upper Extremities
CHEST	Thorax
CS	Cervical Spine
EXT	External
FACE	Face
HEAD	Head
LEG	Lower Extremities
LS	Lumbar Spine
NA	Unspecified
NECK	neck
SPINE	Spine Unspecified
TS	Thoracic Spine
UNSPEC	Unspecified

OK ? Print Search EXIT

Data, data everywhere....

◆ Transplant procurement



....Not a drop can be analyzed

◆ Organs donated variable



Trauma Registry Organs Donated Screen

These are the organs that were donated by the pat...

Option	Description
BATH	Bathing
BEHAVE	Behavior
BRRAIN	BRRAIN
COG	COGNITION
COM	COMMUNICATION
CORNEA	CORNEA
DIET	DIET
DRESS	DRESSING
EARBONES	Ear bones
EXP	EXPRESSION
FEED	FEEDING
HEAR	HEARING
HEART	HEART
HL	HEART AND LUNGS
KIDNEY	KIDNEY
LIVER	LIVER
LOC	LOCOMOTION
MARROW	BONE MARROW
MS	MUSCULOSKELETAL
OTHER	OTHER ORGAN DONATION
PANCREAS	PANCREAS
SKIN	SKIN
SPEECH	SPEECH
SPINE	SPINAL CORD
VIS	VISION

OK ? Print Search Filter Help Exit

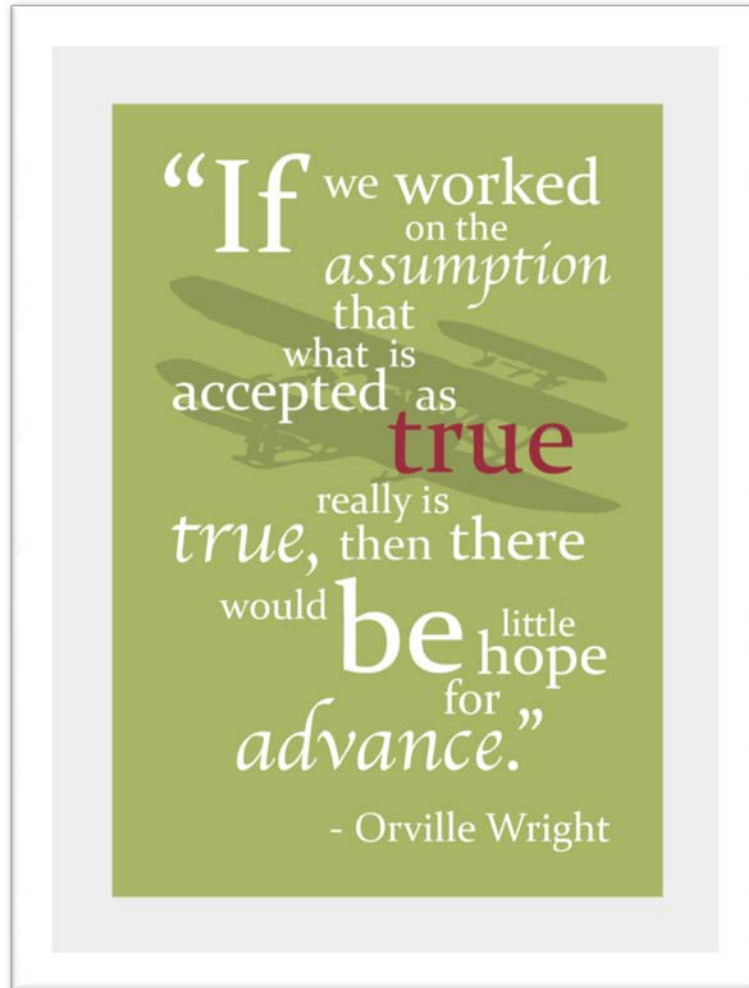
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OK ? Print Search Filter Help Exit

Research with clinical data



“Do not assume that recorded data is suitable for research.”

Issues

◆ Variables

- Unclear names
- Applicable to more than one true measure
- Unnecessary data

◆ Values

- Too much free text
- Inconsistent coding across variables
- Unclear
 - Missing vs. unknown
 - Not applicable vs. missing
- Non-numeric coding

Recommendations

◆ Variables

- Define narrowly
- Avoid overlap (collinearity)
- Use dummy variables (1/0)

◆ Data dictionary

- Variable/Value
- Creation date

◆ Values

- Numeric
- Used consistently across database
- Rarely free text
 - “other” value
- Specify codes for missing vs. unknown vs. not-applicable

Road to successful research



Thank you

