Safety Enhanced Design Brief
Making Effective Use of Color

Carefully used colors can dramatically improve the efficiency and safety of health information systems by drawing attention to important items and making it easier to perceive differences and trends.

Incorrectly used colors can make a display hard to use, hard to interpret and misleading.

1 **To maximize the communication benefits of color, design**
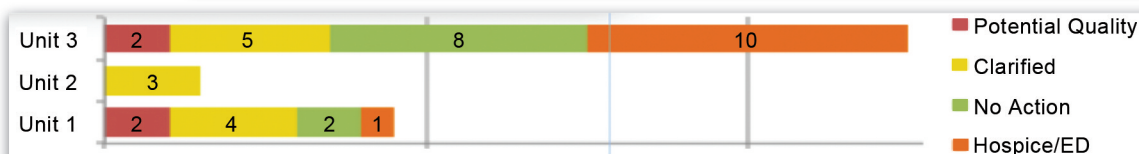-Use gray scale, then add color sparingly

Colors emphasize only title and high (orange) / low (blue) values

• Endocrine Events				
BP:	H 178/80 mmHg	(03/02/10)	H 169/84 mmHg	(12/30/09)
Wt:	85.300 kg/188 lbs	(12/30/09)	85.400 kg/181 lbs	(12/29/09)
BMI:	0	(02/08/10)	0	(02/01/10)
Smoking Hx:	Non Smoker/History of Smoking	(03/02/10)	Non Smoker	(12/14/09)
HGB:	14.3 g/dL	(03/02/10)	16.0 g/dL	(12/21/09)
K+:	hemolyzed mmol/L	(03/02/10)	3.8 mmol/L	(12/21/09)
Cr:	0.84 mg/dL	(03/02/10)	0.86 mg/dL	(12/21/09)
MicroAlb/Cr:	18.3 mcg/mg Creat	(10/05/09)	H 52.8 mcg/mg Creat	(11/14/08)
GFR (AA):	112.22 mL/min	(03/02/10)	109.21 mL/min	(12/21/09)
GFR (non AA):	92.59 mL/min	(03/02/10)	90.11 mL/min	(12/21/09)
Glu:	105 mg/dL	(03/02/10)	H 123 mg/dL	(12/21/09)
HbA1c:	5.7%	(10/05/09)	5.8%	(03/18/09)
Total Chol:	H 205 mg/dL	(10/05/09)	193 mg/dL	(09/30/09)
HDL:	L 26 mg/dL	(10/05/09)	L 31 mg/dL	(09/30/09)
Chol/HDL:	7.9	(10/05/09)	6.2	(09/30/09)

2 **To group items into different categories**
-Use no more than 7 colors (4 recommended)

Unit 3: 2 | 5 | 8 | 10
Unit 2: 3
Unit 1: 2 | 4 | 2 | 1

- Potential Quality
- Clarified
- No Action
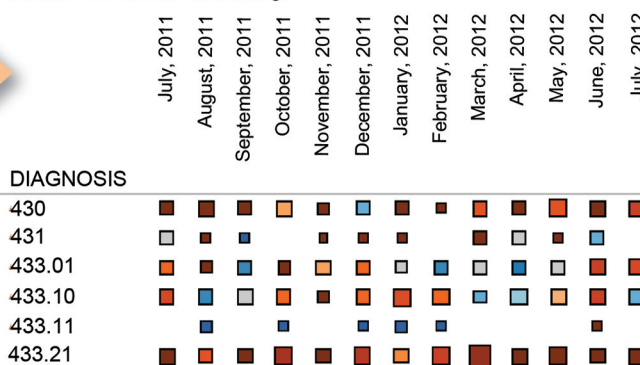- Hospice/ED

3 **To show sequential ranges of quantitative values**
-Use 1 color (for sequential) and 2 colors (for diverging) values
- Vary color intensity from pale (low values) to darker (extreme values)

Compliance Rate
0.0 — 100.0
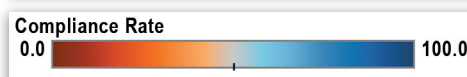
2-color heatmap of varying intensity visualizes sequential ranges

Compliance Heatmap
Month, Year of Date of Discharge

July, 2011 / August, 2011 / September, 2011 / October, 2011 / November, 2011 / December, 2011 / January, 2012 / February, 2012 / March, 2012 / April, 2012 / May, 2012 / June, 2012 / July, 2012
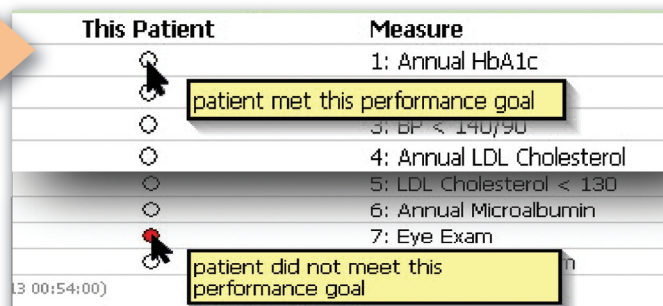
DIAGNOSIS
430
431
433.01
433.10
433.11
433.21

4 **To ensure consistency, learnability, and to prevent misinterpretation, create rules for:**
- Colors for critical values items
- Colors for severity of warnings and alerts, etc.
- Colors for different categories of
- Colors combined with differentiators (tooltips, symbols, icons, positions)

5 **To ease understanding and learnability of colors**
-Use text, tooltips or legends

Mouse-over text explains dot coloring

This Patient | Measure
1: Annual HbA1c
patient met this performance goal
3: BP < 140/90
4: Annual LDL Cholesterol
5: LDL Cholesterol < 130
6: Annual Microalbumin
7: Eye Exam
patient did not meet this performance goal
(3 00:54:00)

6 **Use color-blind friendly colors** (10% of men and 5% of women are color-blind). Combine color with an image, shape, position, or text to convey same meaning. In ① prefixes L (low) and H (high) are in separate columns to reinforce color

7 **To select appropriate color schemes, use tools that match schemes to data types and support color-blind safe choices** (see http://colorbrewer2.org/) Use tools that preview design as it would be seen by a color blind user (see http://www.color-blindness.com/coblis-color-blindness-simulator)

SHARPC NCCD