



Veterans Health Administration Bar Code Medication Administration

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"Oh, that. That's part of our new billing system."

Medication Error Prevention

- Design the healthcare delivery system at all levels to make it safer
- Build safety into the processes of care
- Make the right thing the easiest thing to do
- Reduce the number of handoffs-
human interventions
- Be proactive vs. reactive in response to errors

Veterans Health Administration Electronic Health Record

- History
 - 1982- VHA began building DHCP its electronic health care architecture
 - 1990- VHA upgraded computer capacity to implement software at a national scale to support integrated health care delivery
 - 1996- VHA introduced VistA to support day-to-day operations at local VA MCs and provide links to allow for COTS products

Computerized Patient Record System (CPRS)

- Released in 1997
 - Single interface to VistA for health care providers
 - Flexible enough to be implemented in a variety of health care settings
 - Presents organized relevant data to directly support clinical decision making
 - Includes:
 - Provider Order Entry
 - Real-time Order Checking
 - Clinical Alerts Notification System
 - Patient Posting System
 - Clinical Reminder System
 - Remote Date Views

Veterans Health Administration EHR Statistics through Dec'06

- Orders
 - > 1.6 Billion total orders processed
 - > 955,000 orders processed daily
- Imaging
 - > 590M total images processed
 - > 884,000 images processed daily
- Vital Signs
 - > 1 Billion vital sign entries
 - > 729,000 vital signs entered daily

History of Bar Code Medication Administration in VA

- 1994
 - VA was one of the first medical organizations to pilot and develop Bar Code Medication Administration technology by field staff at the Topeka Veterans Affairs Medical Center
- 1999
 - roll out to all VA Medical Centers (60,000 beds)
- 2003
 - 100% of all VA wards documenting medication administration using BCMA
- 2007
 - >850M doses administered since inception
 - >600,000 medication administrations each day

Bar Coding Challenges in Health Care

- Business Process Re-Engineering
- ***Bar Code Quality Assurance***
- Balancing Ergonomics with Equipment and Systems
- Equipment Interoperability
- Data Standardization
- Data Privacy and Security

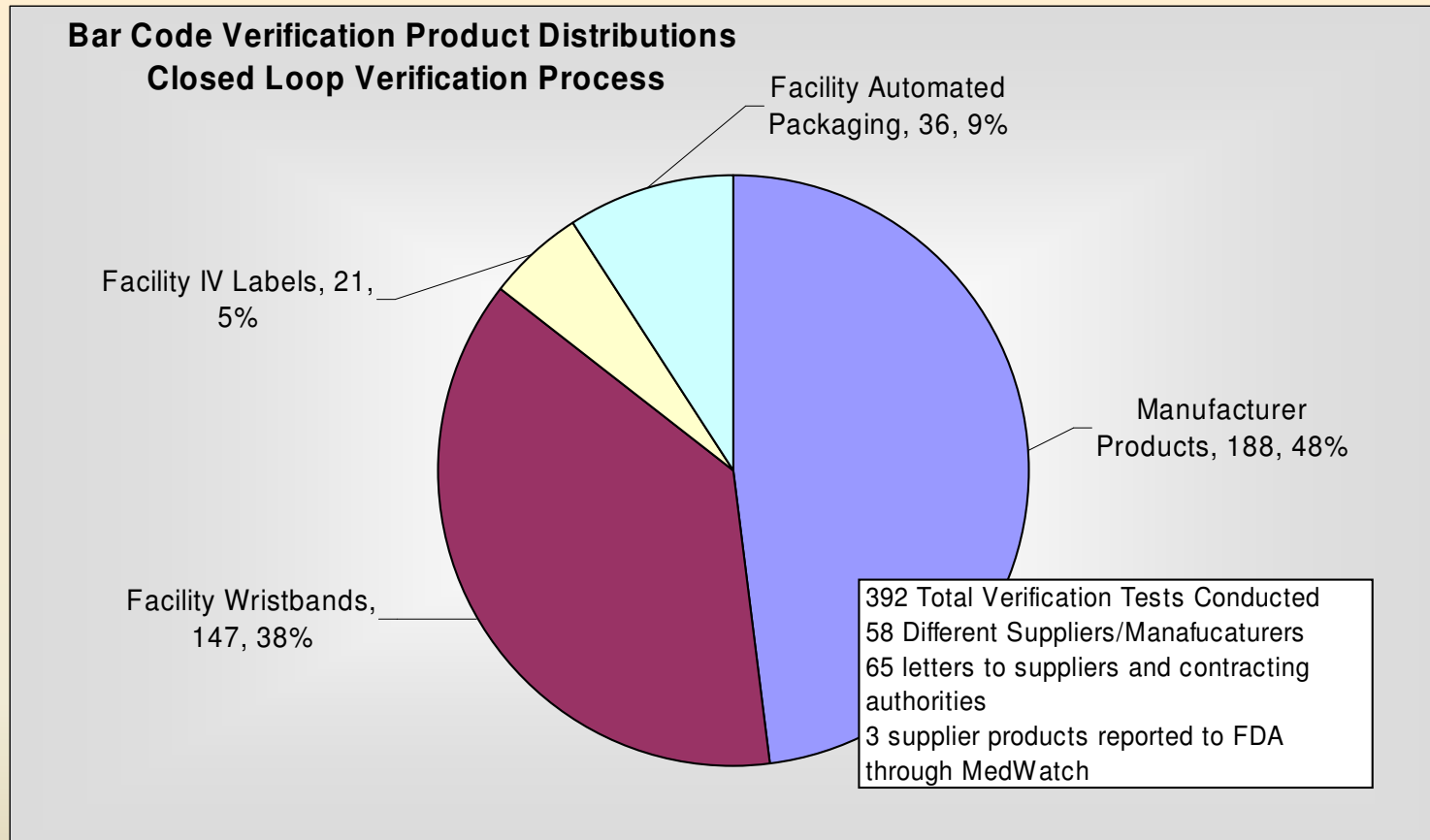
Pharmacy Bar Code Labeling

- When you're in the bar code printing business you need to measure bar code quality
 - Why won't this label scan?
 - Is it the scanner, the bar code, the label, or the printer?
 - Are the bar codes you're printing fostering software workaround?

Bar Code Quality Programs in VA

- Sept 2004
 - Developed Closed Loop verification procedures for all VA facilities
- Oct 2004
 - Established Bar Code verification labs
- Feb 2005
 - BCMA Coordinators at each VA medical center
- Mar 2005
 - Bar Code Quality Clause added to VA contract vehicles
- May 2005
 - Wristband Verification Testing conducted for all VHA Wristband Printer & Print Media Combinations
- Mar 2006
 - Bar Code Quality Directive distributed
- Dec 2006
 - All scanners, printers, and print media must be tested and purchased from the Bar Code Resource Office approved list

Closed Loop Verification Procedure



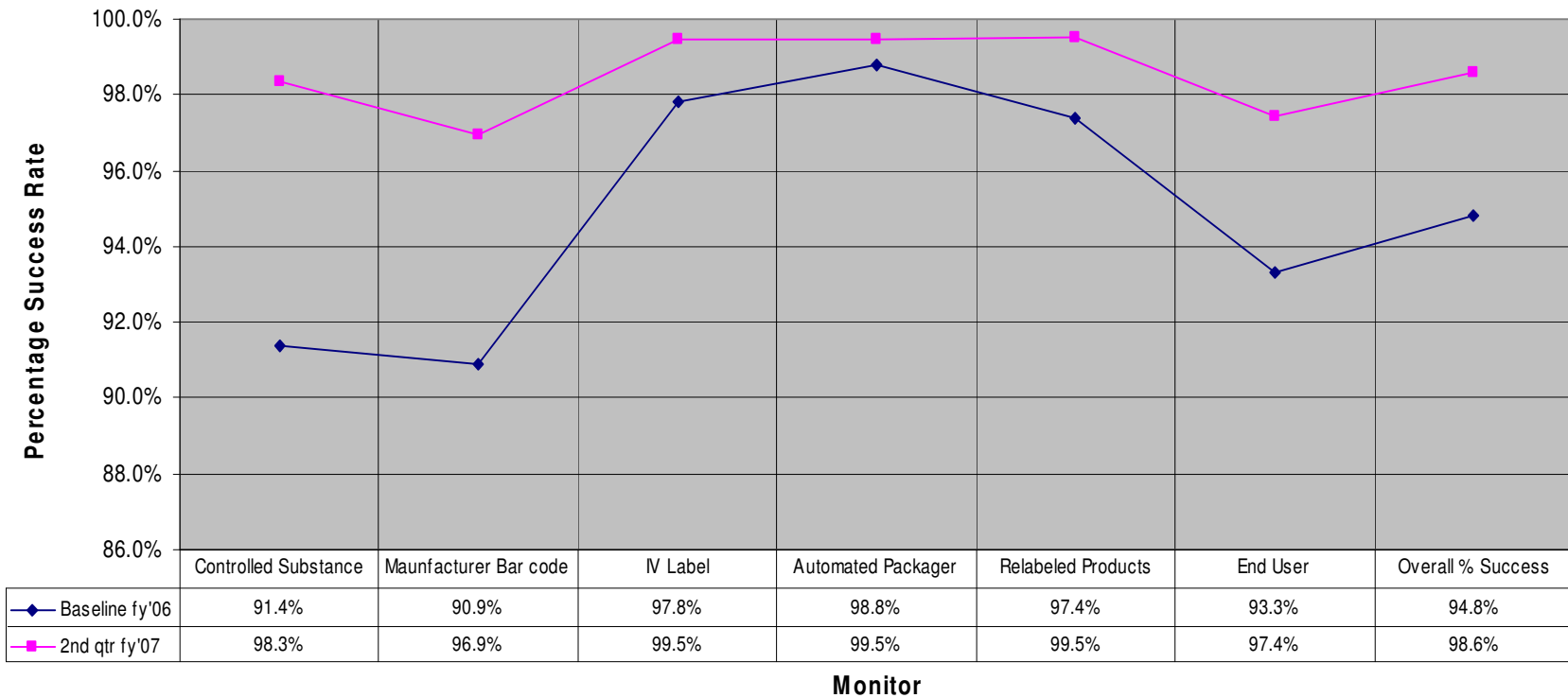
- Results are communicated to the facility, contracting authorities, manufacturers, FDA through *MedWatch*

Bar Code Quality Directive- Performance Management

- Validating field improvements through evidence based practice
- Bar Code Quality Directive requires quarterly monitors for 6 areas:
 - Controlled Substances
 - Manufacturer Packaging
 - IV Labels
 - Automated Packaging
 - Pharmacy Re-labeling
 - End User
- > 1,000,000 bar codes were scanned in 1 year of data collection through direct observation

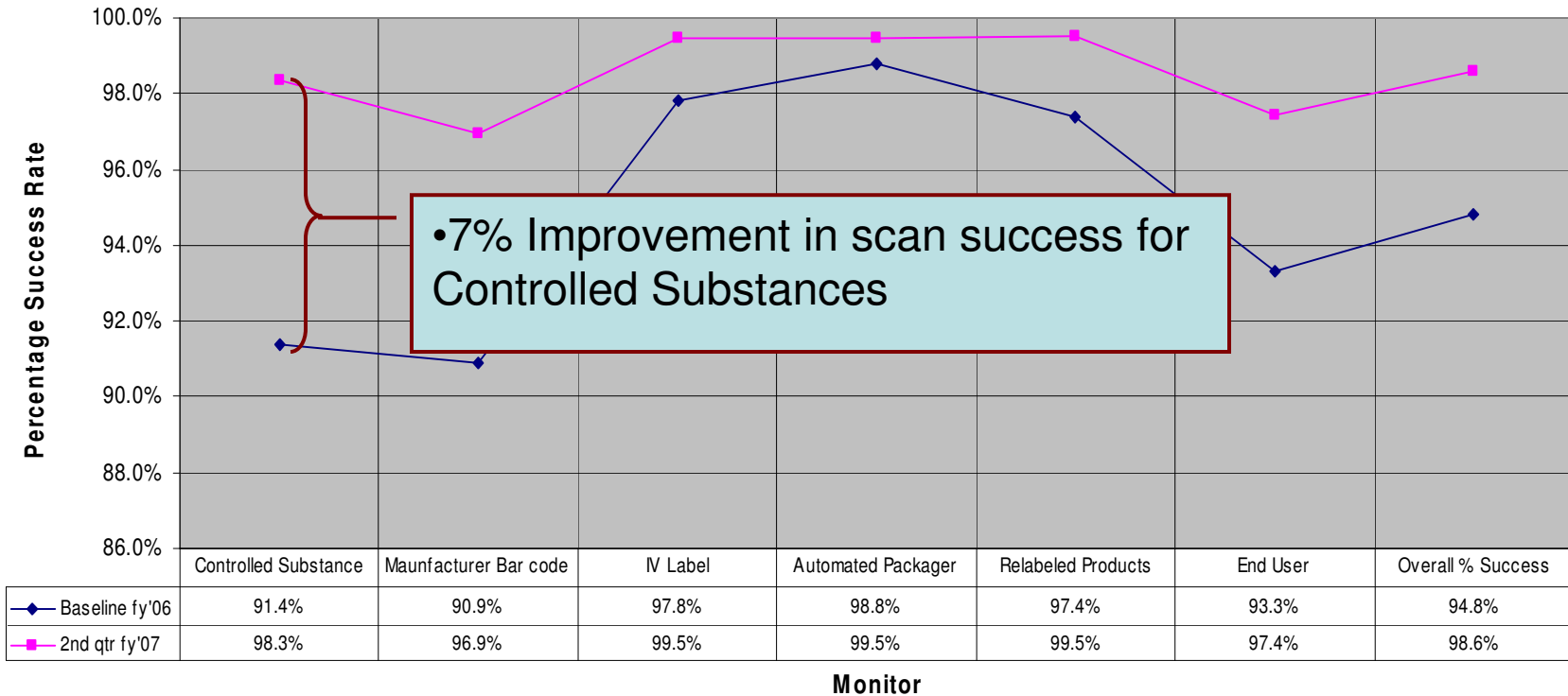
Performance Management Results

**Directive Monitor Enterprise Comparison
to Baseline**



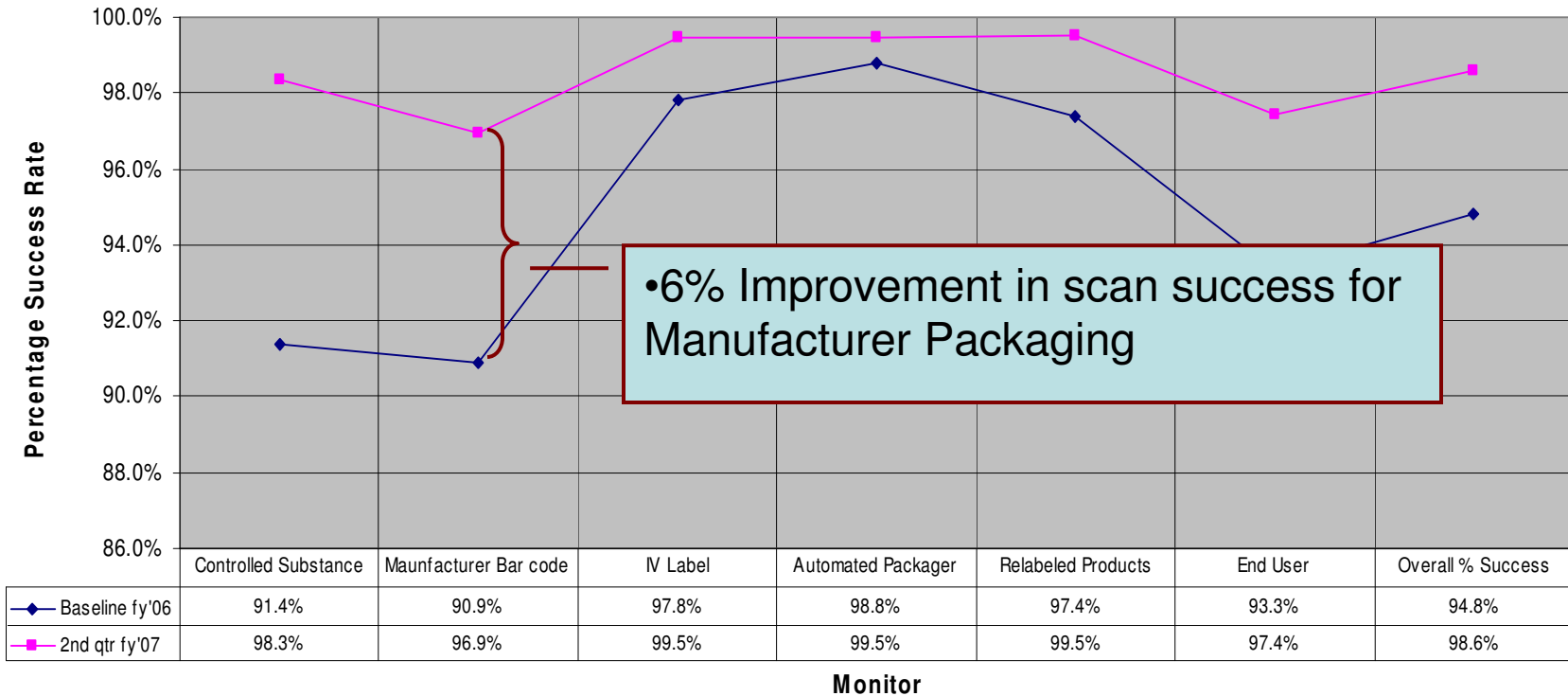
Performance Management Results

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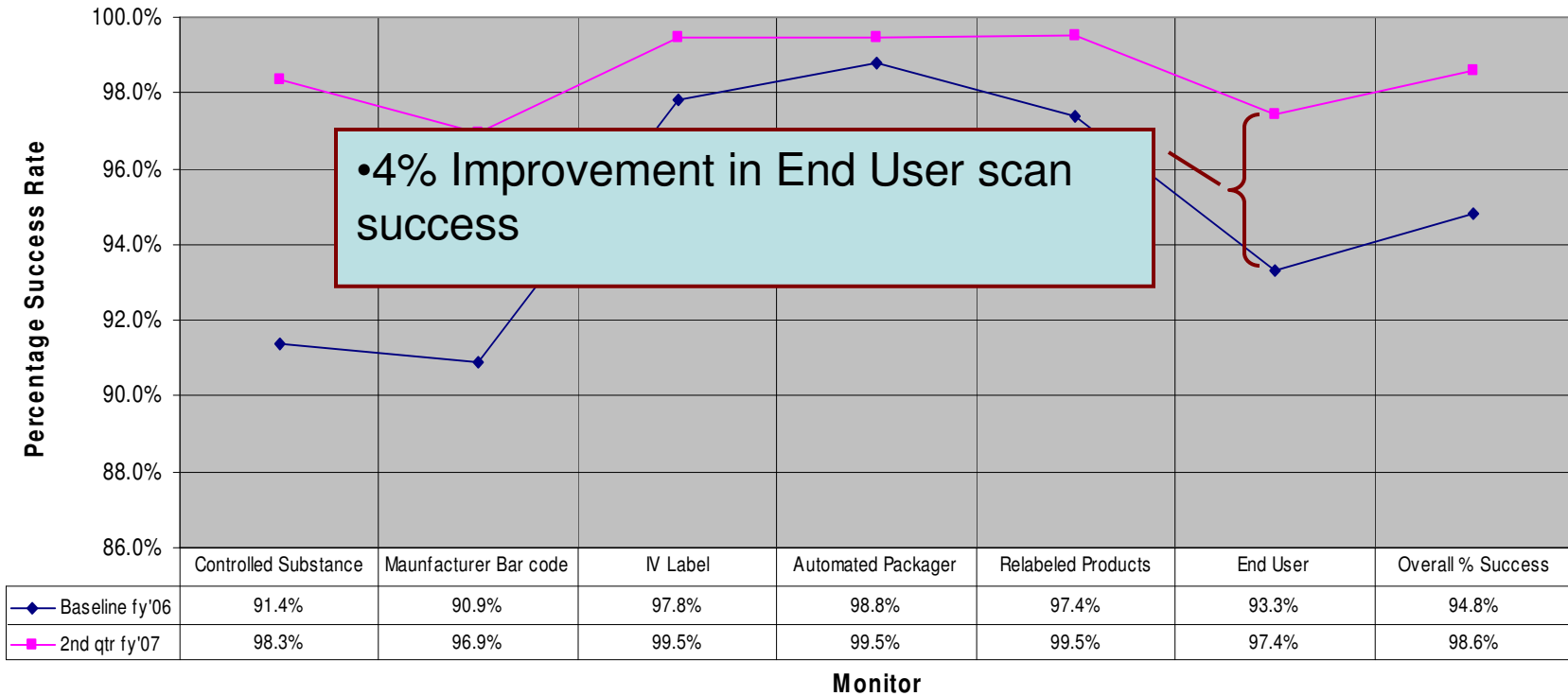
Performance Management Results

Directive Monitor Enterprise Comparison to Baseline



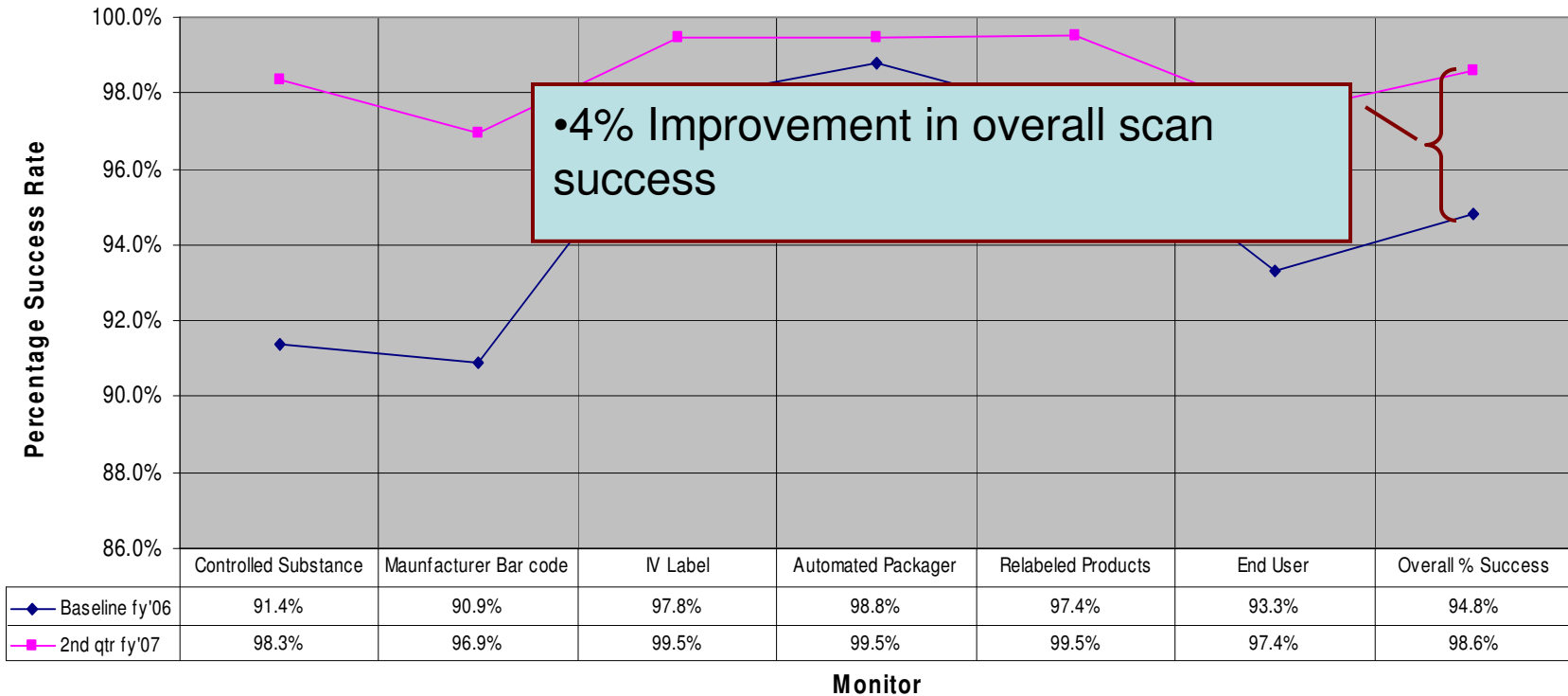
Performance Management Results

Directive Monitor Enterprise Comparison to Baseline



Performance Management Results

Directive Monitor Enterprise Comparison to Baseline



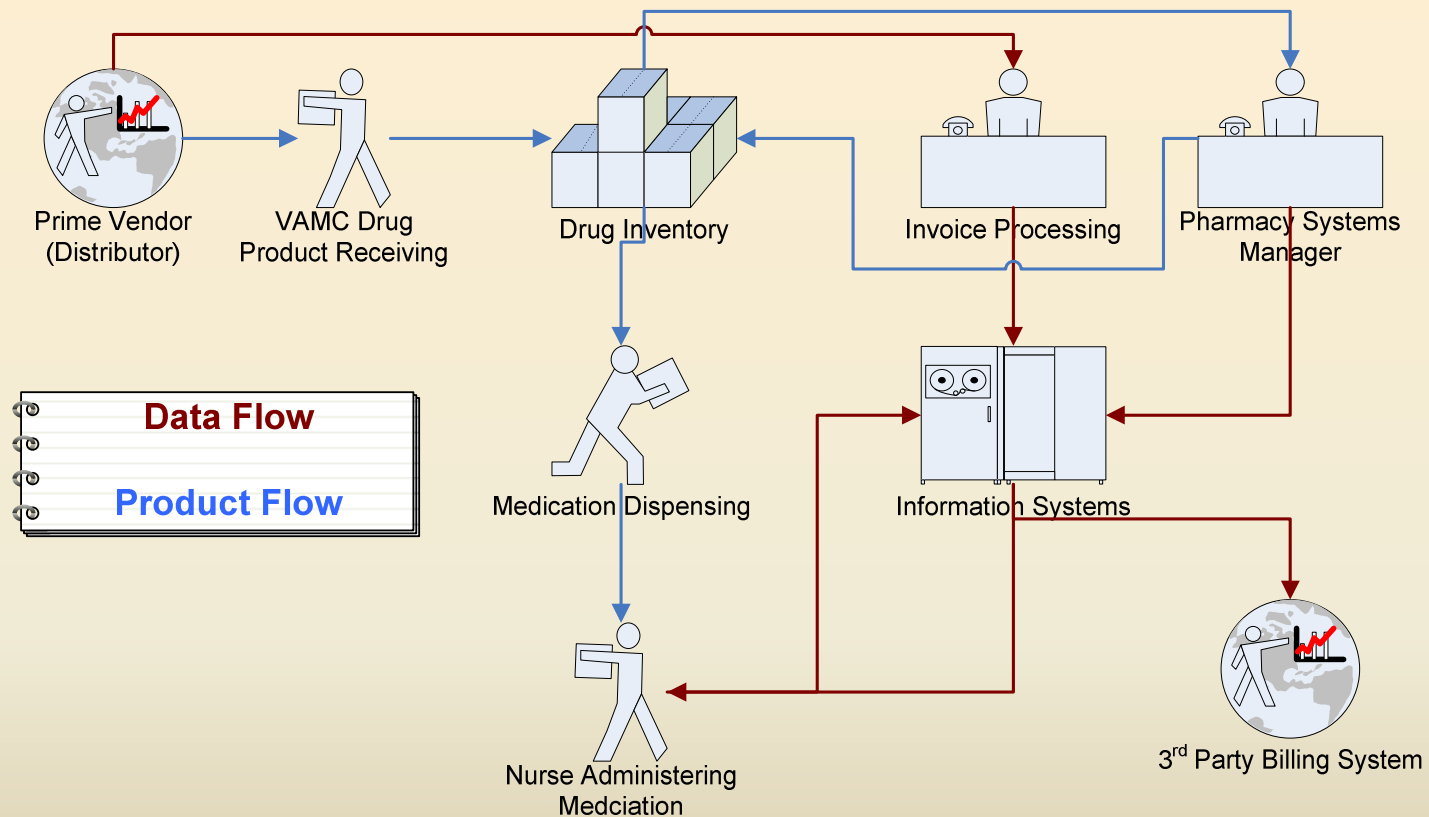
Interpretation of Results

- 600,000 medications administered per day

Year	% Scan Success	Successful Scans per Day
2006	93.3%	559,800
2007	97.4%	584,400

- While 24,600 more products consistently scan there are 15,600 (2.6%) that remain problematic each day

Product and Product Data Flow for Medication Administration

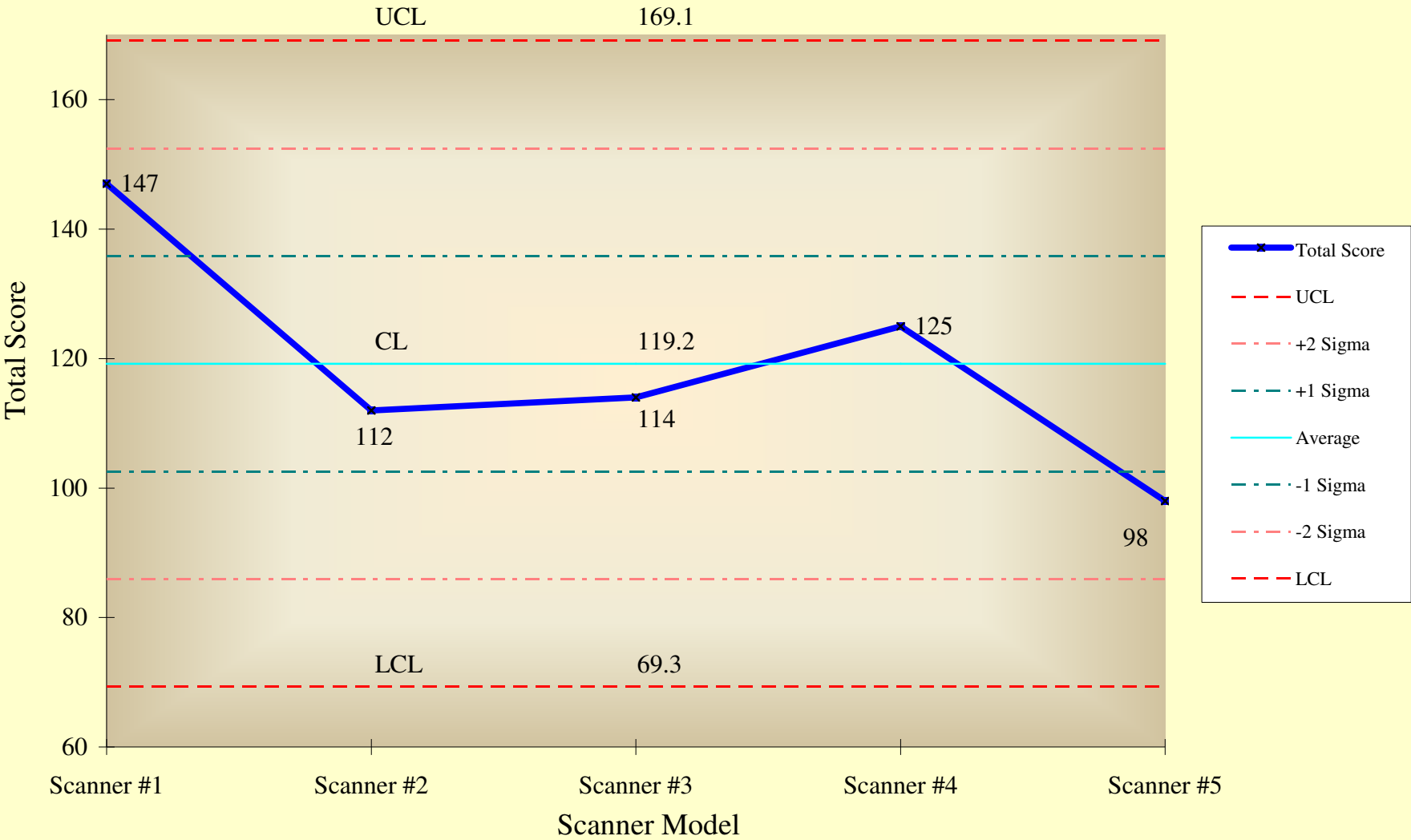


Equipment Evaluations- Scanner

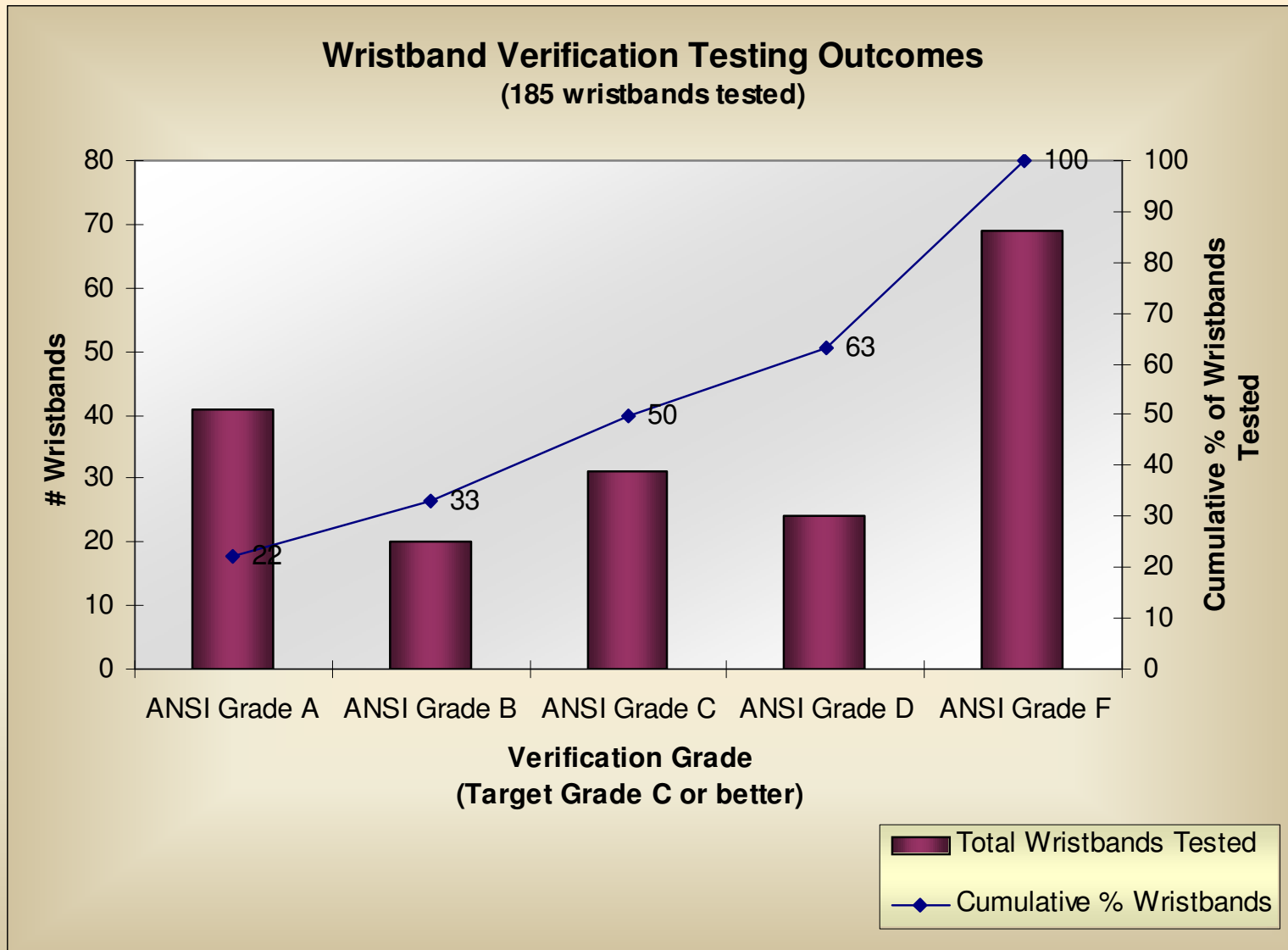
- 136 Evaluation Criteria
 - Security of Wireless Communication
 - Characteristics of Scan Reader
 - Ease of Set-Up
 - Physical Characteristics
 - Usability / Human Technology Interface
 - Symbology Readability
 - Customer Service
 - Battery Maintenance
 - User Satisfaction

Equipment Evaluations- Scanner

Scanner Criteria Performance



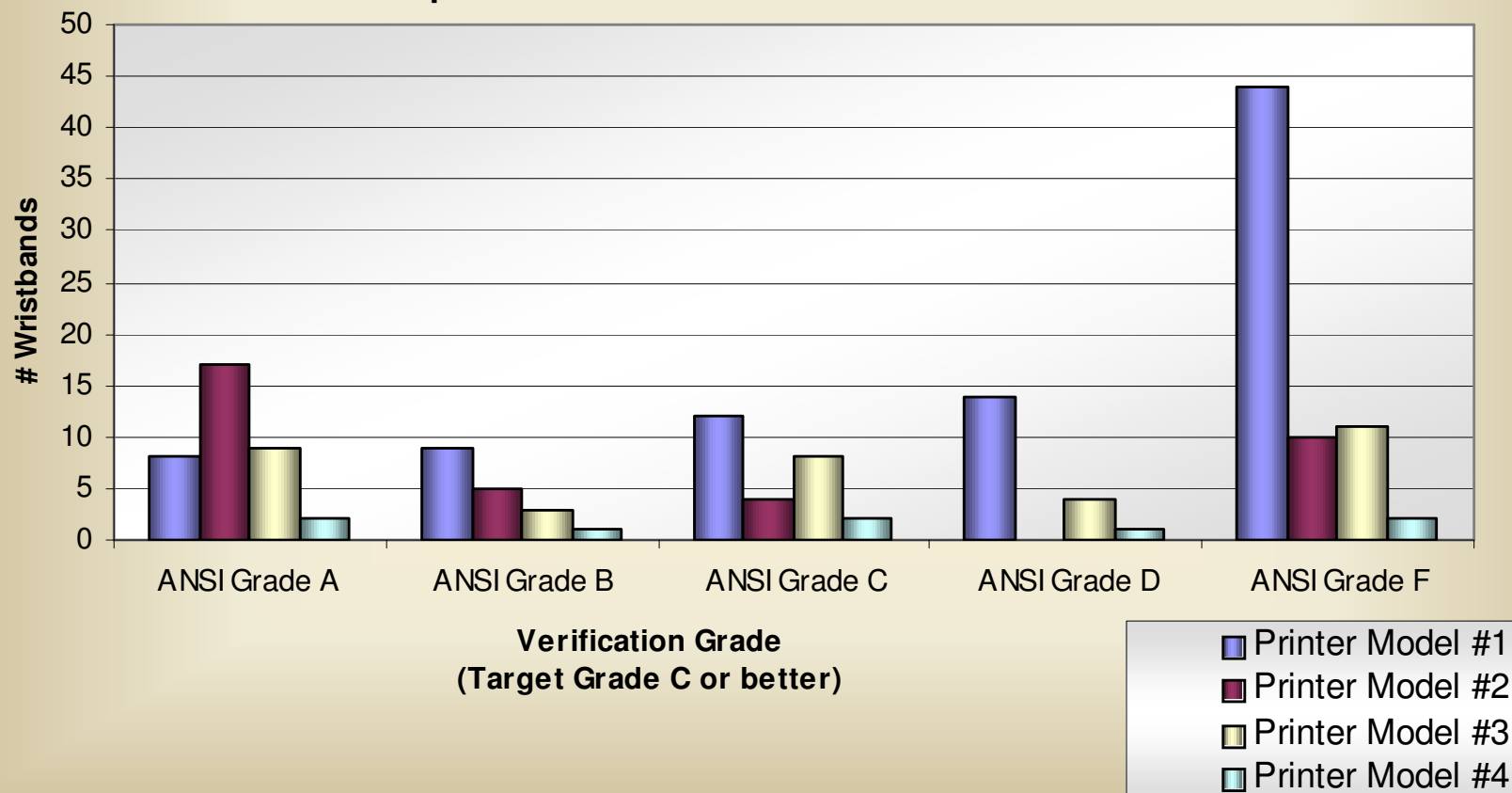
Wristband Testing Outcomes



Wristband Printer

Verification Grade Wristband Printer

Top 4 Based on Volume Tested-185 Wristbands

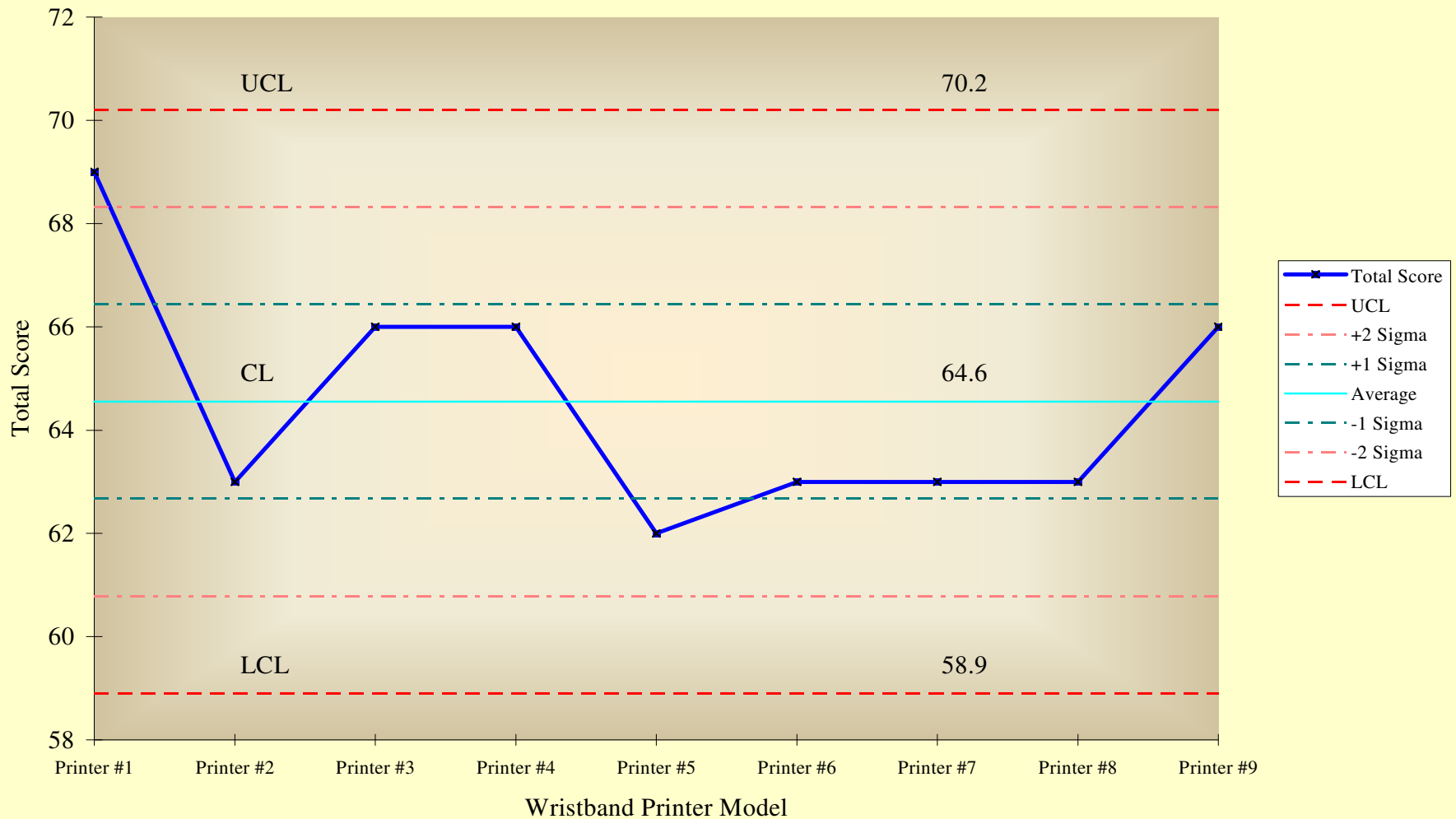


Equipment Evaluations- Wristband Printers

- 63 Evaluation Criteria
 - Bar Code Verification
 - Ease of Set-Up
 - Usability / Human Technology Interface
 - Customer Service
 - Print Formatting

Equipment Evaluations – Wristband Printers

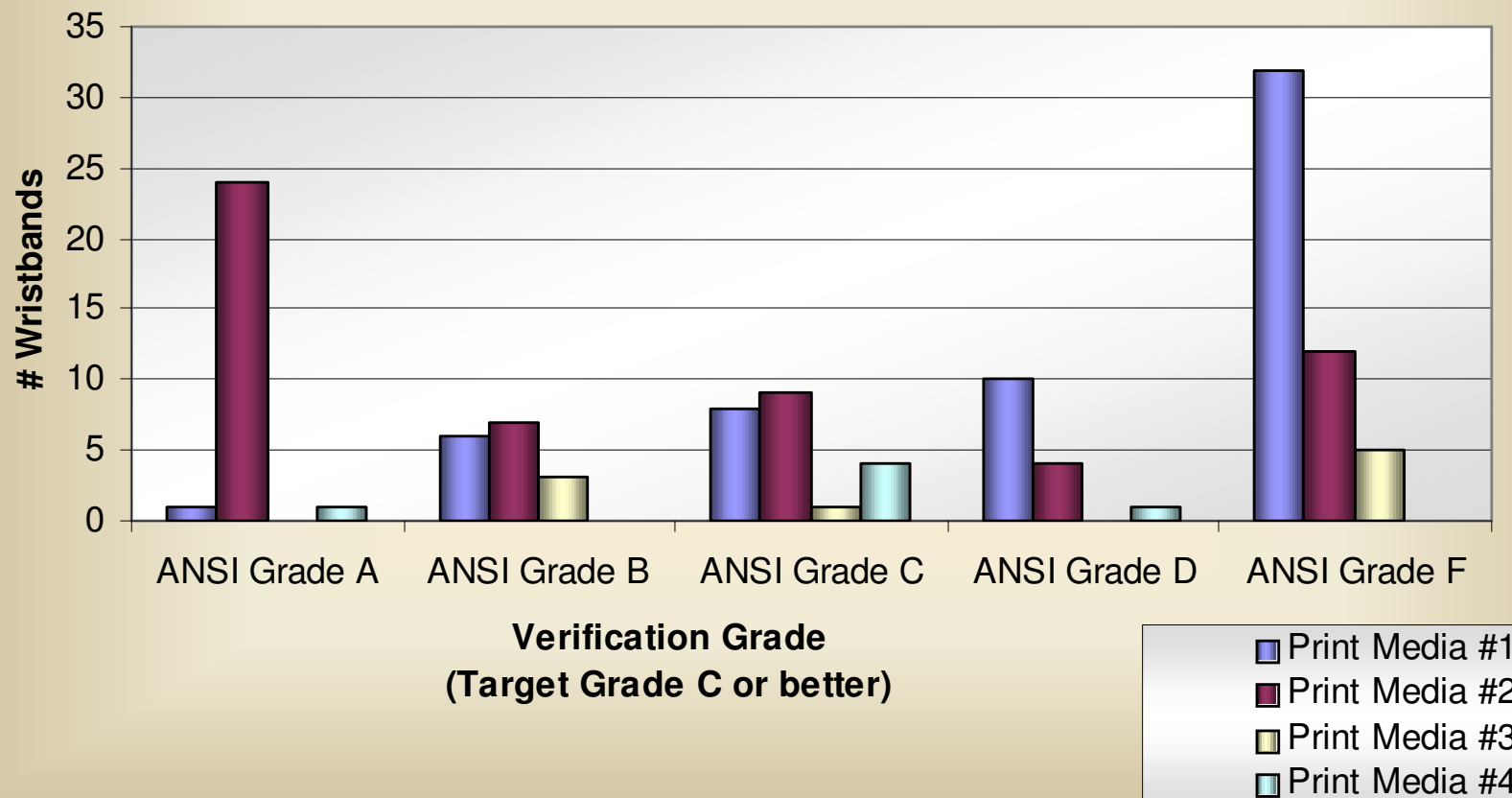
Wristband Printer Performance Criteria Score



Wristband Print Media

Verification Grade Wristband Print Media

Top 4 Based on Volume Tested-185 Wristbands

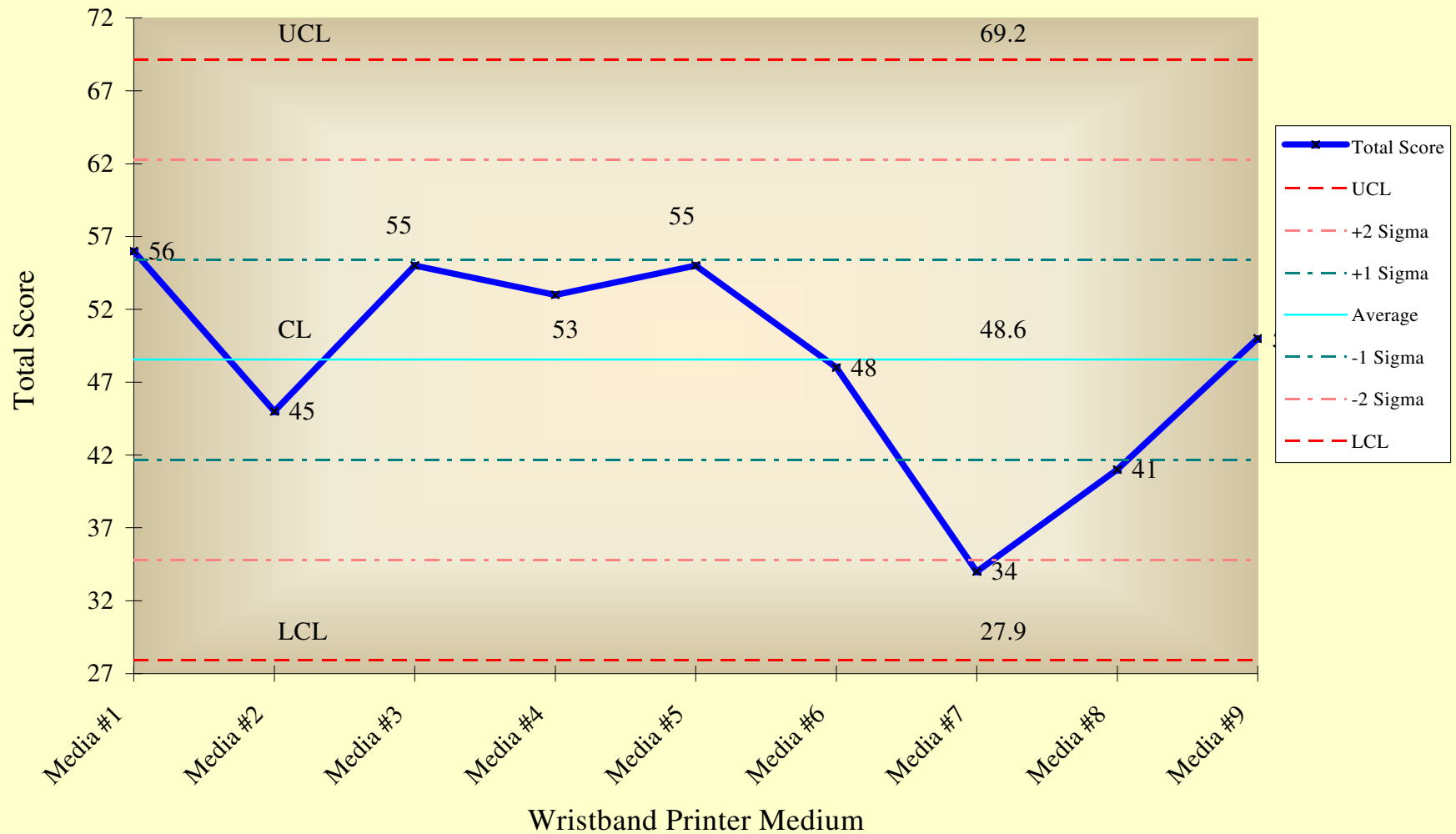


Equipment Evaluations – Wristband Print Media

- 60 Evaluation Criteria
 - Bar Code Verification
 - Longevity
 - Usability/Human Technology Interface
 - Wearer Satisfaction

Equipment Evaluations – Wristband Print Media

Wristband Printer Medium Performance Criteria Scores



Ongoing Issues

- Supplier / Packager
 - Lack of universal verification practices
 - Verification not consistently conducted on the actual finished packaging
 - Verification not conducted on unit of administration
 - Lot number and Expiration Date-no standard formatting of data
 - Multiple barcodes placed in close proximity making it difficult to scan the ‘right barcode’
 - Bar codes on packaging that are NOT unique product identifiers
- Enterprise
 - Multiple linear symbologies resulting in scanner reprogramming
 - Wristband manipulation
 - Durability of bar codes on multiple use containers
 - Recognition of unique bar code product identifier



Questions?