

North Mississippi Health Services, Inc.

**CSP and Warehouse Lean for North Mississippi
Medical Center and Affiliates**



Two Reasons Why I was Brought to NMHS



1. Build a new warehouse/distribution (logistics) facility to replace the old 11,000 sq. ft. facility that operated like a storeroom.



2. Cut costs to the hospital system

Discovery and Planning

In discovery phase found that two problems blossomed into 5-6 problems



1. New facility needed for Logistics



2. Started an aggressive contracting phase that got physicians involved w/ Purchasing



3. Determined the current MMIS system (AMS) was outdated and inefficient



3a. In looking at systems still couldn't find one w/good warehouse management functionality



4. Central Sterile Processing (CSP) too small & outdated



5. Laundry designed 20 years ago reaching the end of it's useful life.

1. New Logistics Facility

Was given a budget and plans for an 18,000 sq. ft. warehouse

Scrapped the plans & designed a 28,000 sq. ft. building w/ state of the art features that stayed within budget

Facility services 6 hospitals, 4 nursing homes, 1 surgery center, 38 clinics and ships about 1200 packages per month for direct home healthcare delivery

Receiving



Receiving



Flow Racking



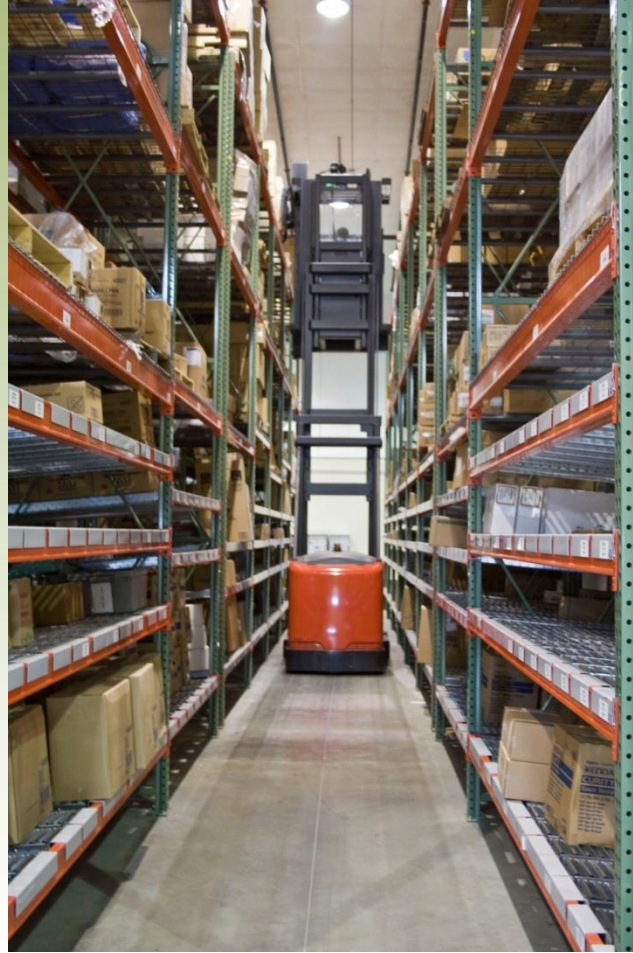
Pallet Racking



Shelf Racking (left)



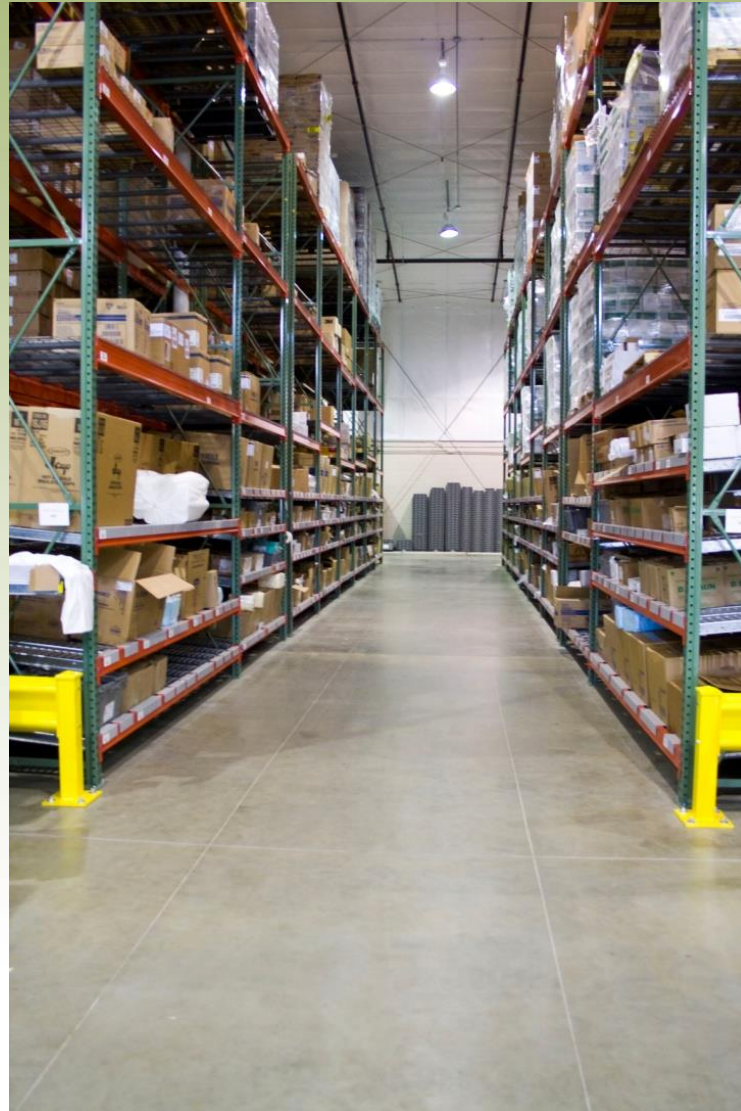
Wire Guidance in Floor



Narrow Aisle Fill Racks



Wide Aisle Picking Racks



Johnson Air Rotation System



3. MMIS System

- Looked at Lawson, McKesson & Oracle (PeopleSoft)
- Chose PeopleSoft 9.0
- None of the systems had a good WMS package



3a. TECSYS

- Looked at TECSYS at McKesson's drug wholesale operation in Memphis in early 2007
- Attended class July, 2007 & went live in November, 2007
- Use TECSYS WMS for tracking expiration dates, lot #'s, proper stock rotation, paperless picking, receiving, etc.
- All personnel wear a wrist computer w/ a laser ring reader (RF device)



RF device



Wireless Printer



WMS Label



Quality construction ensures worry-free function both at home and on the job.

Support is provided by a wide, high-strength, breathable nylon panel with full welding and seven enclosed self-contouring stainless steel stays.

Styles vary and may include wide 1 1/2" suspension straps for stability and lifting assistance.

Side bands have wide Velcro® fasteners for easy adjustment. Retainer straps hold loose side bands in place and within easy reach.

panels to fit comfortably.

North Mississippi Health Services	
Tag	Date Received
 T24235	2008 - 06 - 04
Part	Quantity
 1060000554	3.000
Part Description	Unit of Measure
BELT, BACK SUPPORT BLK. MED	EA

200 DeBusk Lane Powell TN 37849
USA 888.938.7828 or 365.938.7828
Authorized Rep: DeRoyal Europe, Limited, Virginia Road, Kells, County Meath, IRELAND 353 46 8999100

DeRoyal Three-D

The crew with RF devices



Stretch Wrapper, Bailer & Compactor



Task Management



Ready to Ship



Command Queue

The screenshot shows a web browser window titled "Command Queue - dromig - prod_76 - Microsoft Internet Explorer". The browser's address bar and menu bar are visible. The web application is titled "EliteSeries" and "powered by ITopia". The main content area is titled "Command Queue" and includes a search criteria section with fields for Task (PICK,RPCK), Item, Carrier, Ship Complete, Shipment, Ship-To Address 1 (UPS,HOME,IBHT), Outbound Order ID, Status, Wave, Tag, and Operator. Below the search criteria, there is a table of records. The table has 14 columns: Task, Status, Item, Outbound Order ID, Shipment, Container, To Container, Current Location, Carrier, Destination Location, Quantity, Quantity Processed, Wave, and Tag. The table contains 14 rows of data. At the bottom of the browser window, the Windows taskbar is visible with the "start" button and several application icons. The system tray shows the time as 12:20 PM.

Task	Status	Item	Outbound Order ID	Shipment	Container	To Container	Current Location	Carrier	Destination Location	Quantity	Quantity Processed	Wave	Tag
PICK - Pick	RDYR - Ready in RF	5020004357	1610647	S32381			L1A1D2	RTE6	SHP7	1.000	0.000	W64597	T23715
PICK - Pick	RDYR - Ready in RF	5020004357	1610647	S32381			L1A1D2	RTE6	SHP7	2.000	0.000	W64597	T24218
PICK - Pick	PAUS - Paused		1615558	S34725	C36086		TRUCK	RTE7	SHP4	0.000	0.000	W67566	
PICK - Pick	PAUS - Paused		1615611	S34744	C36097		TRUCK	RTE6	SHP7	0.000	0.000	W67566	
PICK - Pick	PAUS - Paused		1615613	S34746	C36099		TRUCK	RTE6	SHP7	0.000	0.000	W67566	
PICK - Pick	PAUS - Paused		1615627	S34756	C36109		TRUCK	RTE7	SHP4	0.000	0.000	W67566	
PICK - Pick	PAUS - Paused		1615628	S34757	C36110		TRUCK	RTE7	SHP4	0.000	0.000	W67566	
PICK - Pick	RDYR - Ready in RF	1005000706	1615699	S34786		C36139	AAC102	RTE6	SHP5	4.000	0.000	W67566	T23291
PICK - Pick	RDYR - Ready in RF	1005000706	1615699	S34786		C36139	AAC102	RTE6	SHP5	6.000	0.000	W67566	T23291
PICK - Pick	RDYR - Ready in RF	1005001114	1615699	S34786		C36139	AAH201	RTE6	SHP5	12.000	0.000	W67566	T18501
PICK - Pick	RDYR - Ready in RF	1005001736	1615699	S34786		C36139	AAA205	RTE6	SHP5	1.000	0.000	W67566	T20624

Electric Pallet Jacks



Stretch Wrapper in Use



3 Wheel Forklift for unloading trucks and moving goods



Process Improvement

North Mississippi Health Services, Inc.

Inventory Transactions

May, 2007 compared to May, 2013

	May, 2007	May, 2013	% Change
Beginning Balance	\$647,398	\$2,469,520	381%
Receipt Units	440,395	700,283	159%
Receipt Dollars	\$1,619,668	\$2,234,574	138%
Issue Units	440,570	731,442	166%
Issue Dollars	\$1,646,442	\$2,315,690	140%
Backorders	303	1	0.33%
Items Ordered	440,873	731,443	166%
Fill Rates	99.93%	100.00%	100%
Total Mispicks	34	14	41%
Mispick Avg./Employee	9	2	22%

Routed Picks

Mispicks	Unit Of Issue	Wrong Item	Routed Picks	% Mispicks
Employees				
BLINDSEY	0	0	6	0.000%
BRAGIN*	1	2	7,082	0.0424%
CGARRISON*	0	0	6,601	0.000%
DDBUCHANAN*	0	0	5,959	0.000%
DROMIG	0	0	111	0.000%
FRUSSELL	0	0	43	0.000%
MAASSALAAM*	0	0	1,044	0.000%
JABARRON	0	0	16	0.000%
JLSMITH*	3	3	5,939	0.1010%
JMMANSELL*	2	1	6,326	0.0474%
TDSTEPHENS*	0	0	6,100	0.0000%
LRMCCOY*	0	1	6,471	0.0155%
RHICKMAN	0	0	0	0.0000%
Total	6	7	45,698	0.0284%
Above Average Routed Picks: 6,503				
Above Average Mispicks: 0.0284%				

* Primary Task of Picking

NMHS Off Site Central Processing Center



History

- Constructed in early 1970's
- 4,423.5 sq. ft.
- Developed to accommodate 6-8 operating rooms
- Renovated in 1990 without additional space or capacity added
- Currently Serving:
 - 22 Main Unit Operating Rooms
 - Hybrid Operating Room
 - 5 Women's Hospital Operating Rooms
 - 4 Cath Labs
 - 2 EP Labs
 - 2 Interventional Radiology suites
 - 36 total support areas
 - 124,129 trays supported per year for all areas

Consultant's Findings



Insufficient equipment

OR inability to find reprocessed trays

Inadequate space for spare instrumentation

Personnel are working in areas not intended for instrument reprocessing

Space needed to do redesign for appropriate flow of process

Inadequate space for supply breakdown

Outdated technology of washers and sterilizers cause tray backup

Previous Process



- If no issues arose, prior day's process finished at 6:30 AM for 7:00 AM surgery
- Inability to meet demand if down time occurred
- Equipment was 10+ years old and was an older generation of technology
- Flashing had become a standard procedure instead of an emergency procedure (JCAHO compliance issue)
- CSP strategy was aligned with the Hospital's Critical Success Factors

Quality



- Expanded space allowed for proper inspection of equipment
- System redundancy will minimize or eliminate downtime
- Minimizes flashing of instruments
- Allows additional backup trays
- Will be compliant with Joint Commission
- Protect the public's interest
- Minimize the damage to existing equipment

Selection of Equipment and Processes

Numerous site visits in the U.S., Canada, Germany, Austria, Switzerland, and France.

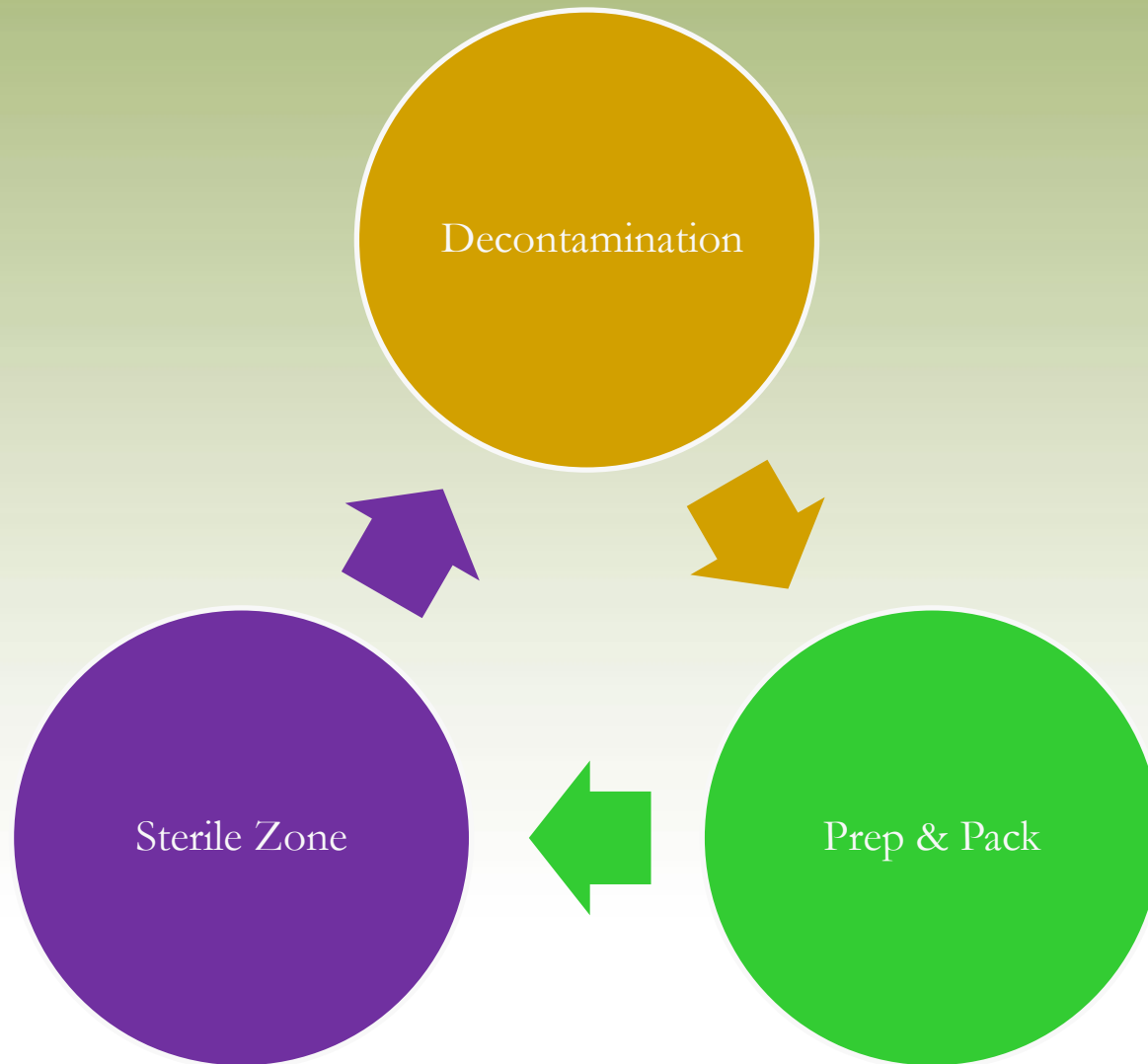
Adopted many European concepts and standards as well as manufacturing methods and standards.

EU more advanced overall compared to U.S. in Sterilization due to CJD.

All equipment is pass-through to eliminate cross-contamination.

We took current practices and extended them to their logical end point, rather than copying what everyone has always done.

3 Zone Concept



Previous Decontamination Room



Previous Instrument Washer



New Decontamination Room and Turbo 88 Instrument Washers



Height Adjustable Carts



Use of height adjustable carts allows for proper body mechanics.

Cart Washer/Decontaminator



Turbo 88 AGS Unload



Advantages of AGS

- Ease of cleaning floor, wall, and ceiling
- Ease of Service
- Tracking at the instrument level
- Bar Code/RFID Programming

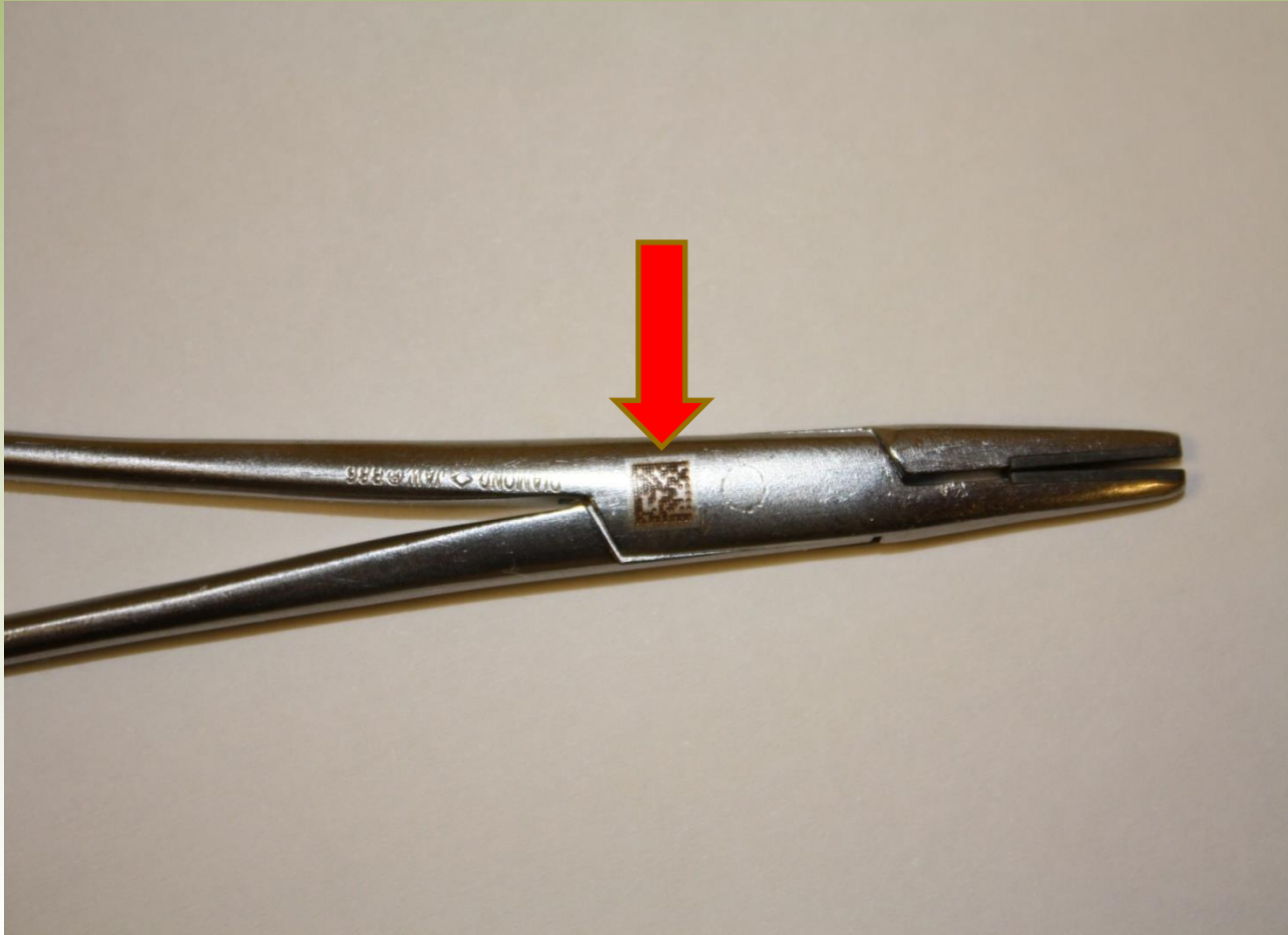


Prep/Pack Zone

- Assemble Instrument Sets
- Scan at instrument level to determine:
 - Correct instrument for correct set
 - Video clips for special assembly
 - Digital pictures of instruments
 - Associate sets with loading car



Bar Coded Instruments



Previous Prep/Pack



New Prep/Pack Area



Prep/Pack Work Station



Previous Sterilizers



New Sterilizers



Case Carts



Carousel



GE Information System



Essential Building



Performance Improvement

CSP Tray Count - FY 2002 thru Sept. 2012

Processing 28.6% more sets than in 2002 or 40% more per FTE

indicates highest month ever

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Month	total #	total #	total #	total #	total #	total #	total #	total #	total #	total #	total #	total #
Oct.	8845	8837	9237	8771	8519	8620	9302	9442	9608	9930	11883	11,775
Nov.	8928	8084	8456	8361	8771	8319	8787	8133	8531	8941	10525	10,098
Dec.	8162	7763	8322	8460	7940	8510	8063	8326	8653	8920	10947	10,242
Jan.	8286	8234	8903	8821	8386	8682	8729	8444	8480	8415	10667	10,094
Feb.	8017	7704	8383	8375	8001	8641	8066	8132	8428	7820	10336	9,689
Mar.	8129	8169	9630	8806	9147	8993	8722	8720	9447	9696	10999	11,066
Apr.	8502	8618	9636	8442	8458	8501	8815	8913	9095	9712	9937	10,517
May	8402	8253	8836	8094	8934	8975	8368	9456	8859	9827	11153	10,088
June	8105	8829	9375	8386	9426	9030	7633	9093	8890	10186	10546	10,336
July	8932	8839	9068	8285	8963	9321	8554	9352	8816	9991	10539	9,635
Aug.	9006	9282	9301	8593	9541	9878	8248	8806	9320	10807	11783	10,339
Sep.	7935	8683	9793	8252	8354	8756	8023	8928	8869	12344	10148	10,250

indicates highest year ever

Total	101,249	101,295	108,940	101,646	104,440	106,226	101,310	105,745	106,996	116,589	129,458	124,129
Avg/Mo.	8,437	8,441	9,078	8,471	8,703	8,852	8,443	8,812	8,916	9,716	11,769	10,344
Change from previous yr.		0.05%	7.55%	-6.70%	2.75%	1.71%	-4.63%	4.38%	1.18%	8.97%	11.04%	-0.96%
FTE's	25	26	26	23	24	24	24	23	24	23	23	23
Trays/FTE	4,050	3,896	4,190	4,419	4,352	4,426	4,221	4,598	4,458	5,069	5,629	5,397
Change from previous yr.		-3.8%	7.5%	5.5%	-1.5%	1.7%	-4.6%	8.9%	-3.0%	13.7%	11.04%	-0.96%

Increase due to several causes:

1. Different types of instrument intensive cases (trauma, neuro, etc. which use more sets)
2. Flashing has dropped off to truly emergency items only and sets are going through the process
3. Started processing for luka and several of the clinics in low volumes
4. Started processing approximately 1500 laryngoscope sets per month, per Joint Commission

Immediate Sterilization

CSF - QUALITY				
IMMEDIATE STERILIZATION				
	FY2010	FY 2011	FY 2012	FY 2013
OCTOBER	105	251	27	26
NOVEMBER	124	65	42	14
DECEMBER	134	181	30	14
JANUARY	80	37	20	4
FEBRUARY	110	57	31	2
MARCH	132	203	20	3
APRIL	140	209	16	4
MAY	130	90	23	7
JUNE	195	45	21	3
JULY	146	33	17	1
AUGUST	149	69	31	7
SEPTEMBER	326	79	32	7
TOTAL	1771	1319	310	92

Laundry



**We are in the design stage for a new
Laundry which will maximize
automation & have built in redundancy**

Automated Laundry Design



- 30 INTERROLL-RAND 800 GALON REVERSE TANK
- 31 INTERROLL-RAND TIGA REPRESENTED AIR DRYER
- 32 INTERROLL-RAND LIFE-65-125 WR COMPRESSOR
- 33 HEAT RECOVERY SYSTEM
- 34 150 BPP FOLDER
- 35 STACK REORDERER
- 36 BLOWOFF SEPARATOR
- 37 DUPLOY FEED TANK
- 38 WATER HEATER
- 39 WATER SWITCHES
- 40 ADVANCED SYSTEMS MACHINE
- 41 SPEED CHEEK CONNECTOR (12) x 3'-6" x 2'-6"
- 42 SPEED CHEEK CONNECTOR (2) x 3'-6" x 2'-6"
- 43 CHICAGO SKYLINE W/M FOLDER
- 44 CHICAGO FLANET BLASTER 8813 BLANKET FOLDER
- 45 SPEED CHEEK FOLDING WIPER
- 46 CHICAGO SKYLINE 2-5 FOLDER W/STACKER 136" W
- 47 CHICAGO WINDY WED FOLDER 136" WIDE
- 48 CHICAGO TWIN RISE FOLDER 136" WIDE
- 49 CHICAGO SKYLINE 2-17 FOLDER DUAL STACKER 136" W
- 50 CHICAGO COUNTRY 8 5000 DRAIN HEATED ROLLER 136" W
- 51 CHICAGO EDGE WAX FOLDER 136" WIDE
- 52 CHICAGO CASIANE HANGING FEEDER W/STAYDOWN
- 53 CHICAGO BRISK TRANSFER CONNECTOR
- 54 AIR CHICAGO SMALL FECE FOLDER
- 55 CHICAGO ATM AUTOMATIC TOWEL FOLDER
- 56 WILOR LINT COLLECTOR VACUUM UNIT
- 57 WILOR WOODWORTH COMPRESSOR 100 x 4 x 3'-10" x 3'-6"
- 58 LOAD HEIGHT = 1'-0" UNCHARGE HEIGHT = 13'-0"
- 59 MAIN WILOR FLATED COMPRESSOR (18'-6" x 3'-0" x 1'-0")
- 60 END WILOR FLATED COMPRESSOR (18'-6" x 3'-0" x 1'-0")
- 61 EXISTING WILOR MIF-1010 LINT COLLECTOR
- 62 WILOR MIF-1010 LINT COLLECTOR
- 63 EXISTING WILOR SACKETT NATURAL GAS DRYER
- 64 WILOR 8453701 NATURAL GAS DRYER - 245" PERISTAL
- 65 WILOR 8453701 NATURAL GAS DRYER - 245" PERISTAL
- 66 EXISTING WILOR MIF5500 SINGLE STAGE PRESS
- 67 WILOR MIF5500 SINGLE STAGE PRESS
- 68 WILOR MIF5500 PP TO MODULE FULCRUM PLUN C/W
- 69 WILOR MOTOR C/W CONTROLLER
- 70 WILOR FLATED COMPRESSOR (12'-6" x 3'-0" x 1'-0")
- 71 WILOR 8453701 NATURAL GAS DRYER - 245" PERISTAL
- 72 EXISTING WILOR MIF5500 SINGLE STAGE PRESS
- 73 EXISTING WILOR MIF5500 SINGLE STAGE PRESS
- 74 WILOR WOODWORTH COMPRESSOR (23'-4" x 3'-10" x 3'-6")
- 75 LOAD HEIGHT = 3'-4" DISCHARGE HEIGHT = 13'-0"
- 76 EXISTING WILOR SACKETT NATURAL GAS DRYER
- 77 EXISTING WILOR CENTRIFUGAL CONTRACTOR
- 78 EXISTING WILOR 7802832 5 MODULE C/W
- 79 WILOR 4234432 STAIN GUARD WAGNER EXTRACTOR
- 80 AMERICAN DRYER 400-170 NATURAL GAS DRYER
- 81 EXISTING AMERICAN DRYER 400-170 NATURAL GAS DRYER
- 82 WILOR MIF-2000 LINT COLLECTOR
- 83 HAND WASH SINKS 3"X6"
- 84 2'x6' LAUNDRY CART
- 85 12' x 4' x 8' BAYON SCALE

ITEM	LEGEND

NORTH MISSISSIPPI MEDICAL CENTER LAUNDRY
TUPELO, MS

LAUNDRY EQUIPMENT LAYOUT
75,850 SQ. FT. LAUNDRY FACILITY

PELLERIN LAUNDRY MACHINERY SALES COMPANY, INC.
701 ANDREW STREET, KENNESAW, LOUISIANA 70082
TEL 504-887-9990 FAX 504-887-9244