Optimizing Front End Flow

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Outline

- Key Concepts
  - Door to In-Process
  - Vertical vs. Horizontal
  - Patient Streaming
- Operational Models
  - Triage Protocols
  - Direct Bedding
  - Super Track
  - PIT
  - Intake Systems
- Volume Bands

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It's Really Very Straightforward….

What do Patients Really Want???
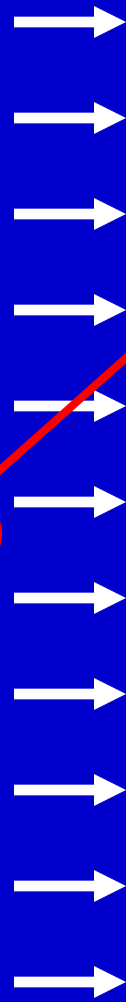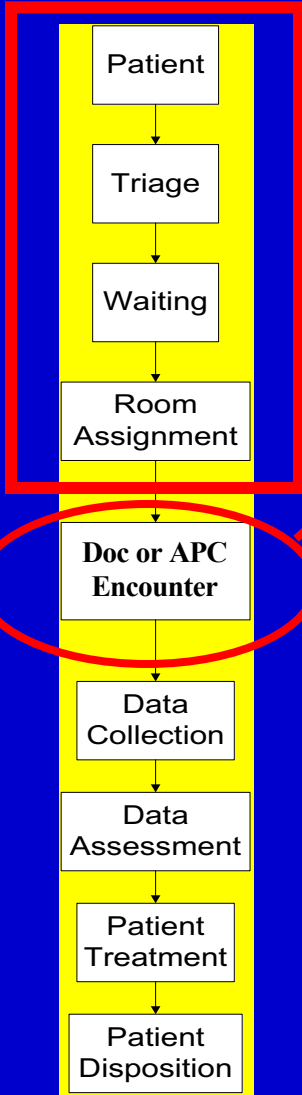
- <u>Get in</u> (see the doctor ASAP)
- <u>Get treated</u> (start getting better)
- <u>Get out</u> (home or upstairs)

✓ **Get In**

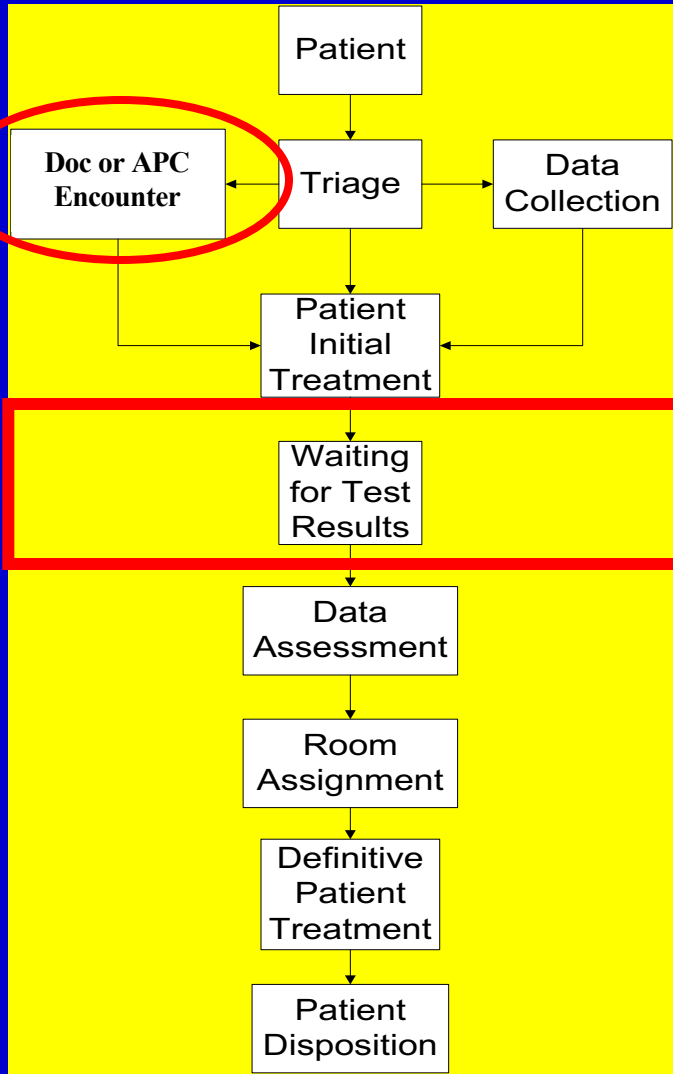✓ **Get Better**

✓ **Get Out**

- The more efficiently you can do these things, the happier your patients will be
- Focus on creating value, eliminating waste and uncouple your key servers

Patient Process

NVA, pre-process waiting

NVA, in-process waiting

Traditional Non Value Added

Patient → Triage → Waiting → Room Assignment → Doc or APC Encounter → Data Collection → Data Assessment → Patient Treatment → Patient Disposition

Ideal Value Added

Patient → Triage → Data Collection; Doc or APC Encounter; Patient Initial Treatment → Waiting for Test Results → Data Assessment → Room Assignment → Definitive Patient Treatment → Patient Disposition

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Get Patients "In-Process" ASAP

1. DIP – "Door to In-Process" ***The most important interval!***
2. Executing on the physician order is key!
3. Must have ***reliable*** ability to draw blood, transport patients to and from diagnostics, and give meds without the nurse running all over the ED. POC testing is bonus.
4. System should be designed to optimize physician and nurse value
5. Physicians should order only necessary diagnostics and treatments (no or few IVs, for example), in order to maximize nurse and tech efficiency
6. No test should be ordered that won't change your management (i.e. lumbar films)

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"Horizontal" vs. "Vertical" Patients

- Horizontal
  - Sick
  - Older
  - Stretcher bound
  - Likely Admission
  - Variable Workup
  - Treatment Limited

- Vertical
  - Well
  - Younger
  - Ambulatory
  - Likely Discharged
  - "Algorithmic"
  - Diagnostic limited

Why do Patients Need Beds?

- Reasons vertical patients need beds:
  - Evaluation
  - Private consultation
  - Treatment
  - Monitoring
  - All other bed time is NVA
- This allows you to offload your bed bottleneck

Get your ED patients in, out with 'virtual' beds

Mary Washington Hospital is trying out a "virtual bed system" that, when compared to the controls, decreased the average time to triage by 39%, decreased the turnaround time for treat and released patients by 16%, and decreased door to physician times by 82%.

The system was developed by two physicians, including **Jody Crane**, MD, MBA, assistant director and business director of the Fredericksburg (VA) Emergency Medical Alliance, a private contract emergency medicine group at Mary Washington.

It involves having all a patient's testing conducted upfront so a patient is never waiting for anything except discharge, Crane says. The patient initially is seen and evaluated by a physician/nurse team who determines the patient's needs, he says.

"Pain is addressed immediately, and any orders which need to be processed are done right behind triage," Crane says. Immediate orders include EKGs; medications such as those for asthma, pain, or allergies; urine specimens; splints; and even contrast for computed tomographies. The labs are processed by a phlebotomist and ED tech team behind the triage area. "From

November 2005 / Supplement to *ED MANAGEMENT®*

Results Waiting

- Internal
  - Patients don't feel they're sent to WR
  - WR is empty
  - Closer supervision
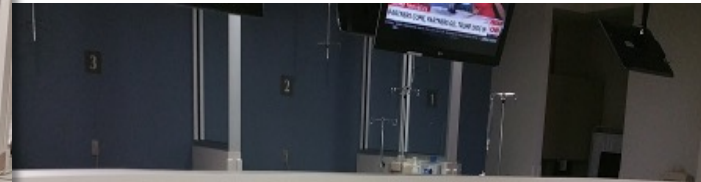 - Less elopement
  - More comfortable
  - Less space
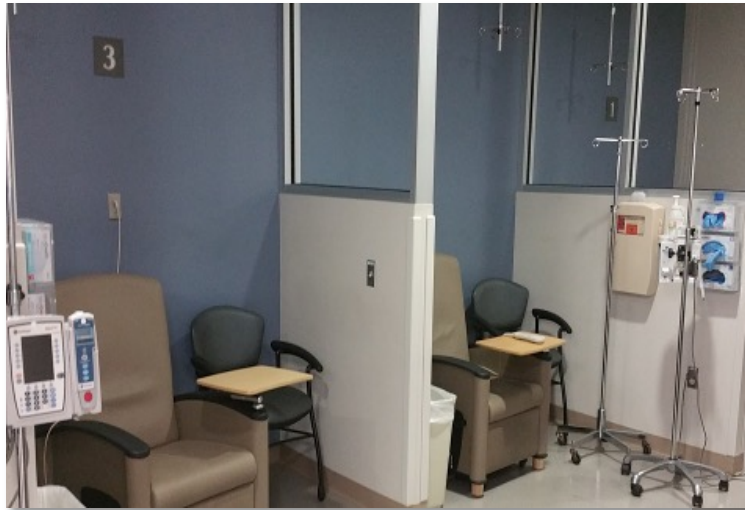
- External
  - Patients may feel going back to WR
  - WR looks busy
  - Less supervision
  - More elopement
  - Less comfortable
  - More space

Ochsner Medical Center – Q Track

Solution

Patient results waiting

Vertical area

Vertical patients will be sent to an area that will act as their 'home base' during their stay in the ED. Physicians will see the patient immediately upon arrival in a private exam room. If tests and treatments are required, the patient will wait in one of the pods (above) until results are ready. At which point, patients will go back to the exam room to be seen by the physician to get the results. Our study indicated that a patient could be in a pod waiting for test results for 90 to 100 minutes

A — Vertical patients individual space made with formed Corian.

B — Winco transfer patient recliner.

C — Pull-out table.

D — Livengood transfer cart with O2, Vac and power in a mobile cart which is plugged into support column when not moving.

E — Power, O2, vac for long term patient support.

F — Family chair.

G — iPad for entertainment and control.

H — Control for Phillips Hue lights, focused sound, air conditioning and patient information.

I — Phillips Hue internet LED lights.

J — ACD Hypersonic focused sound panel.

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Reception

1. Tech – Patient Sign-in
2. Reg Clerk – Quick reg
3. Pivot RN

Pivot RN

1. Initially sorts patients
2. Identify sick patients
3. Patient placement

There are Really Only 3 Types of ED Patients…

Easy

Complicated

Sick

Simple

Complicated

Complex

A. Gawande, Checklist Manfesto

Emergency Streaming

Pivot RN

Pivot RN

Initially sorts ST patients

Identify Level 1,2 patients

Patient placement

Mini Triage

Discharge

Intake

15-20%

Super Track

ESI 4-5

Super Track

Lab - Phlebotomy

Rad Room

50-60%

Intake/PODs

ESI 3

Peds WR

Intake

20-30%

Main ED

ESI 1-3

Treatment

OR 1

OR 2

OR 3

OR 4

TR 5

TR 6

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Demand - Arrival Acuity by HOD

Daily ESI Distribution - Overall ED
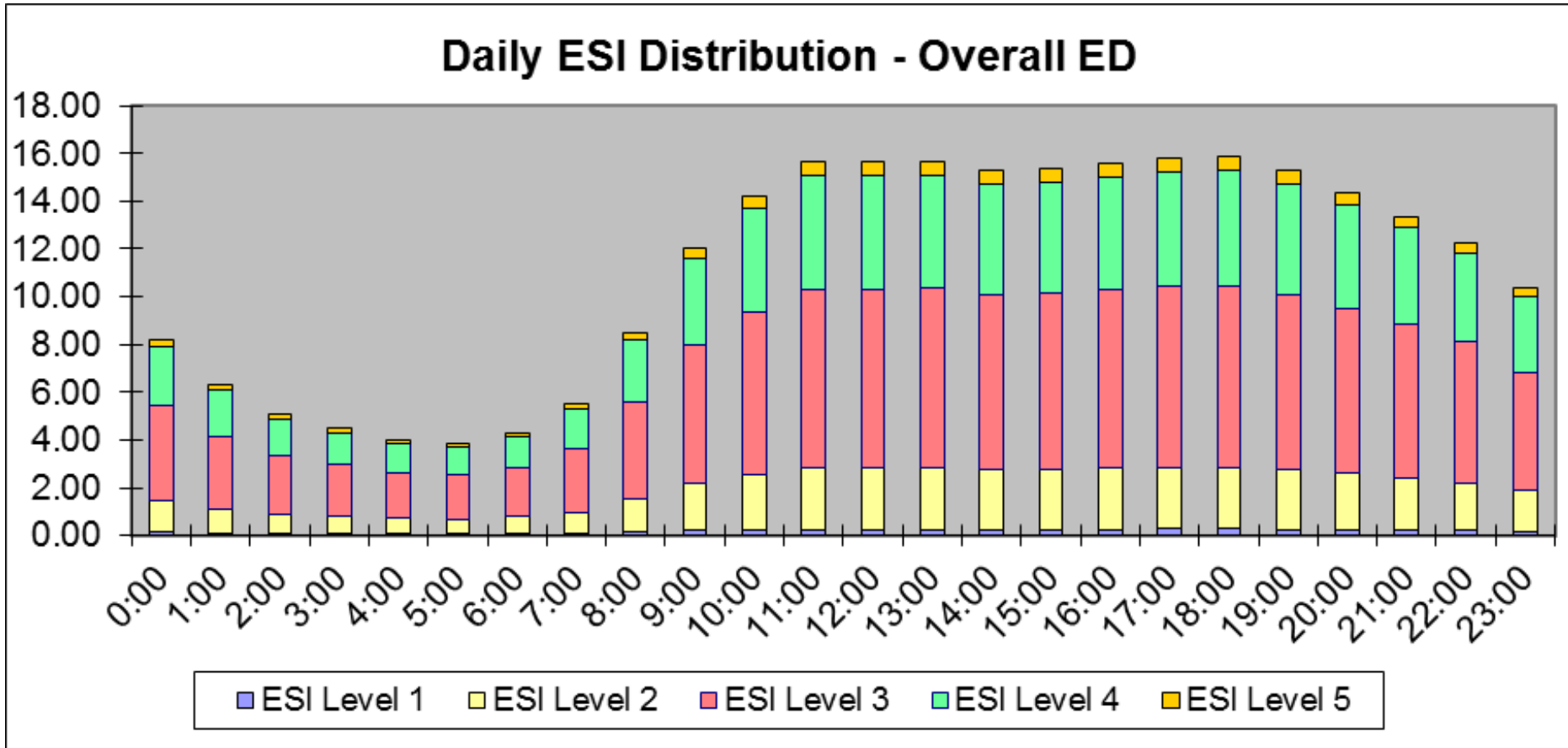
Low, Mid, High Acuity Arrivals

Main ED and Fast Track Volume by Hour of Day

4.0 Low
3.0 Mid
2.5 High

Legend: ☐ Average Main ED Arrivals ☐ Average Mid ☐ Average Fast Track Arrivals
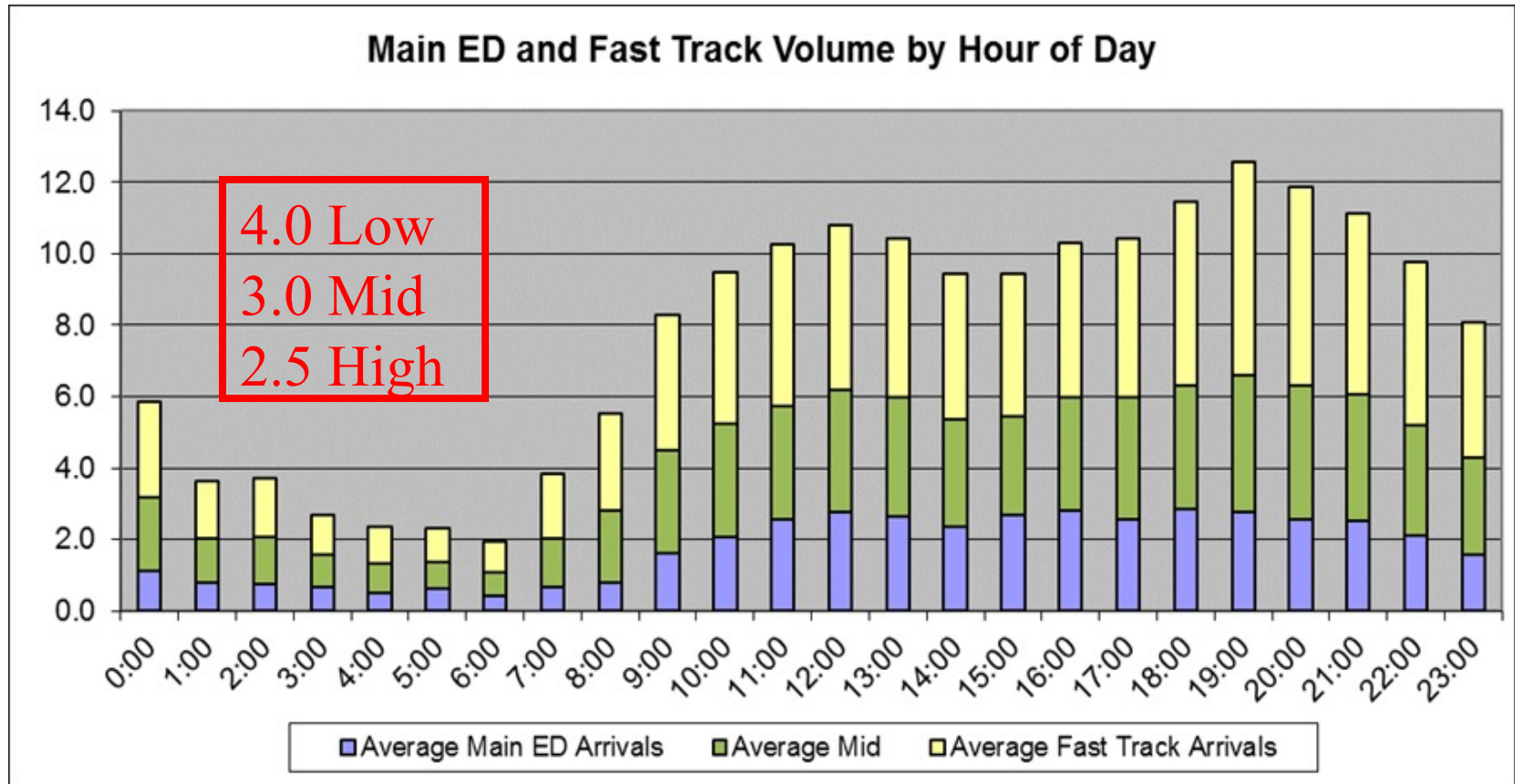
Low Acuity Arrivals = ESI 4,5

Main ED and Fast Track Volume by Hour of Day

2 FT
6 Main ED
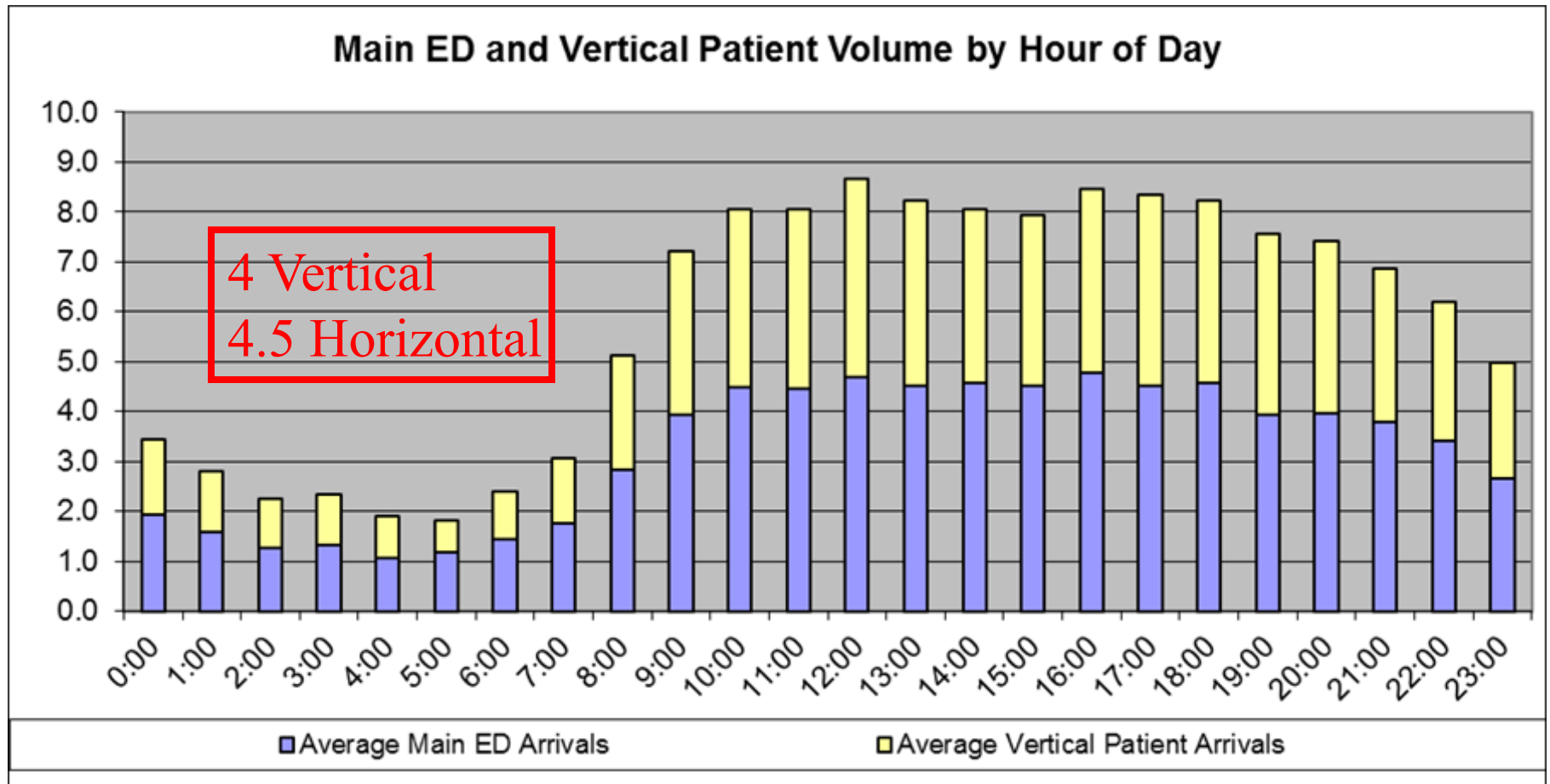
Legend: ■ Average Main ED Arrivals   □ Average Fast Track Arrivals
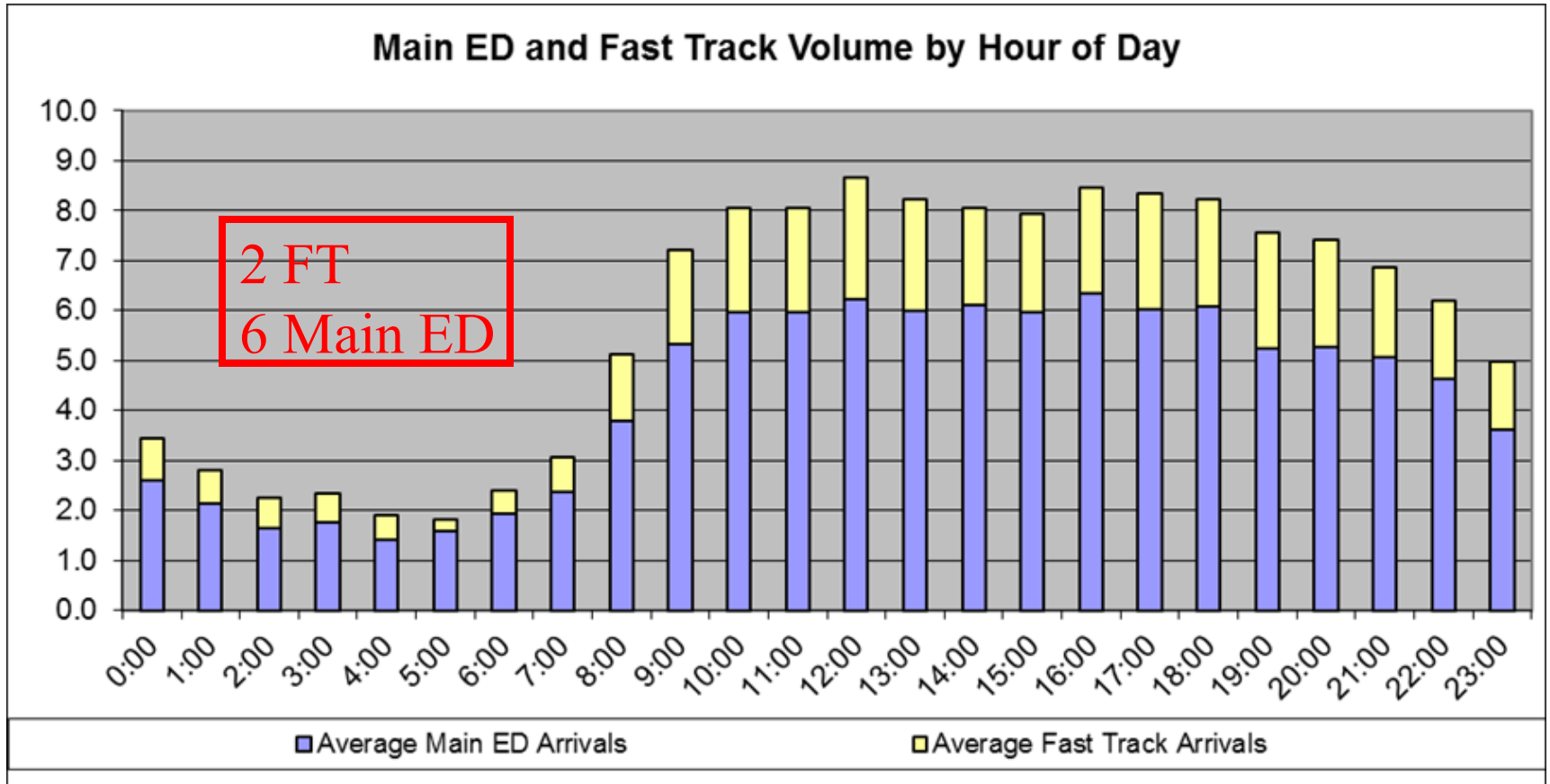
Intake Arrivals – ESI 4, 5, 33% ESI 3

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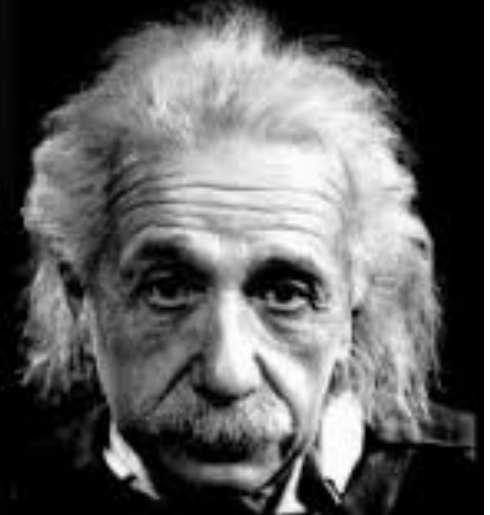- Volume Bands

Simplicity
is the
ultimate
sophistication.

Introducing
Apple II,
the personal
computer.

Everything should be made
as simple as possible,
but not simpler.

Albert Einstein

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Triage Protocols

MVA - musculoskeletal

Chief Complaint	CBC	CHEM7	TROP	HCG (♀ only)	Bedside Glucose	UA and CX	EKG	Chest XR	Peak flow	Blood Cultures	Pulse Ox	Treatments To Holding immediately if unstable
Abd Pain	✓	✓		✓		✓						NPO: If pain upper abd add Serum Amylase, Lipase, LFT. Pregnancy: FHTs for gest>12wks. Progressive HCG.
Asthma-Adult									✓		✓	Breath Sounds-SaO2<92% initiate 2L PRN If no contraindications: Albuterol 1 unit dose neb
Asthma-Peds											✓	Breath Sounds-SaO2<92% initiate 2L PRN If no contraindications: Albuterol 1 unit dose neb
Back Pain-No Injury				✓		✓						
Bone Injury												XR of affected area. Urine HCG not needed if shielding.
Chest Pain >40 yo	✓	✓	✓	✓			✓	✓			✓	Start EKG w/in 10 min. Place IV Saline Lock.
Chest pain <40 yo				✓			✓	✓			✓	Start EKG w/in 10 min.
Confusion	✓	✓		✓	✓	✓					✓	
Diarrhea	✓	✓										Orthostatic Vitals; If orthostatic, place IV Saline Lock
Dizziness	✓	✓		✓	✓		✓					Orthostatic Vitals; If orthostatic, place IV Saline Lock
Eye Complaints												Visual acuity. Immediate eye flush for chemical exposure; Other than conjunctivitis, contact MD immediately
Flank Pain	✓	✓		✓		✓						Place IV Saline Lock.
GI Bleed	✓	✓										Orthostatic Vitals/PT/PTT/INR studies if on anticoag meds. If orthostatic, place IV Saline Lock
Mental Health/OD	✓	✓		✓	✓	✓	✓				✓	Hepatic Panel, Urine Toxicology, BAL, Urine Beta, TSH, Safety check
Palpitations	✓	✓	✓	✓			✓				✓	Draw TSH
Pediatric Fever											✓	Tylenol 15 mg/kg PO **OR** if >6 mos Ibuprofen 10 mg/kg; Collect but do not send UA
Shortness of Breath	✓	✓		✓			✓	✓	✓			Initiate O2 at 2LPM for sat<92%-Take to holding, consult MD for additional lab work
Sickle Cell Crisis	✓	✓		✓								Reticulocyte Count (send out test)-Blood culture if fever>101.5; Place IV Saline Lock
Sore Throat												Rapid Strep
UTI Symptoms				✓		✓						Urine GC/Chlamydia for males with dysuria and penile discharge
Vaginal Bleeding	✓			✓								Pregnancy: Progressive Serum Beta HCG if positive. FHT's if>12 weeks
Vaginal Discharge				✓		✓						
Vomiting	✓	✓		✓	✓							IV Saline lock. If associated with abd pain, refer to abd pain triage

Triage Protocols

- Good if all MDs agree, RNs have reliable assessments and use them.

- If not all tests ordered, no time saved.

- If too many tests ordered, waste and higher utilization of ancillaries.

- Physician may have been able to discharge patient without labs, but now they are pending.

- *Should only be implemented when there are temporary waiting periods, >60 min door to doc.*

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Direct Bedding

Direct Pullback/Immediate Bedding

Pros

- Gets patients in front of treating doctor
- Less potential for triage congestion
- Eliminates triage waste

Cons

- Often nursing conflict
- Potential for increased risk if treating nurse is tied up with sick patient
- If beds are a constraint will reliably fail daily
- If other resource constraints, census can escalate

Innovative Operational Models

- Most efficient EDs Allow for connection of physicians and or APCs at the front end and take great care to limit other variables such as bed or nursing availability
- Low Acuity
  - Fast Track
  - Super Track – MWHC
- Provider in Triage
  - PIT – Sacramento
  - RME – CEP
  - Conveyance - HCA
  - Provider Directed Queuing – Chris Deflitch, Hershey, Penn State
- Intake Systems/Split Flow
  - Split Flow – Cochran, Roche, Banner Health
  - RATED/Super Track – MWHC
  - qTrack – Joe Guarisco, Oschner Health

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MWH showed kindness, competence in crisis

Date published: **6/13/2007**

A few nights ago, my 2-year-old son had an unfortunate encounter with our living room table, and let's just say the table won. By the time I reached him, he was covered in blood. We immediately left for the hospital. I walked in with no shoes on. My son and I were drenched in blood.

The person at the desk kindly took us straight into triage. I was still shaking and was having trouble filling out the forms, so a sympathetic woman behind the counter filled them out for me.

They'd already taken his vitals by the time my husband came in from parking the car. We were quickly given a room, and a nurse brought some warm wipes to wash off the blood and some slipper socks for me to put on.

The physician's assistant who worked on my son was wonderful. She not only made silly faces and was able to make my son laugh, she later brought him a train to play with. They were able to use glue to seal the cut instead of stitches, and we were in and out of the hospital within an hour and a half.

As I was walking out of the hospital with dried blood all over my shirt, slipper socks on my feet, my son in my arms, and a smile on my face, something occurred to me.

I was not just happy about the service we'd just received; the truth is, even if it had taken 10 hours, I was eternally grateful to that hospital for just being there. I was thankful to live in a country in which, when you are standing in your living room helpless, with your child bleeding in your arms, and for a brief moment not sure what to do, there are doctors and nurses close by who do.

So I would like to say "thank you" to all the physicians, physician's assistants, nurses, and staff at Mary Washington Hospital for doing the excellent job they do.

Kim Cannon Stafford
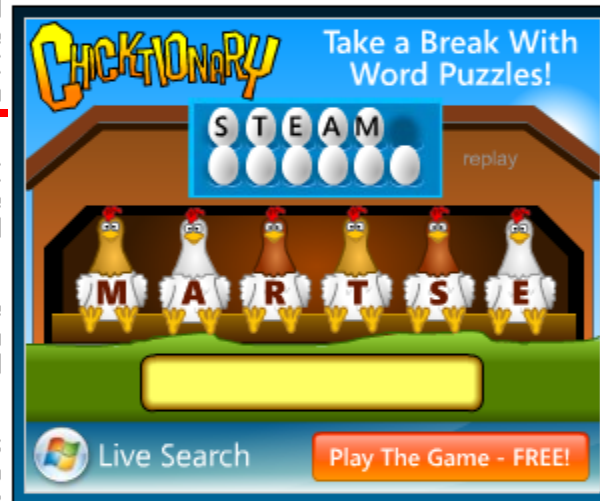
SPECIAL OPs

DR. WELCH is a practicing emergency physician with Utah Emergency Physicians and a research fellow at the Intermountain Institute for Health Care Delivery Research. She has written numerous articles and three books on ED quality, safety, and efficiency. She is a consultant with Quality Matters Consulting and her expertise is in ED operations.

The SuperTrack Is SUPER!

Patient segmentation can improve efficiency, patient care, and other key ED metrics

Other newer examples of patient segmentation include:

- **Geriatric ED**
- **Chest pain center**
- **Pediatric ED**
- *Critical decision unit*
- *Observation unit*
- **SuperTrack**

by SHARI WELCH, MD, FACEP

For emergency departments seeing medium to high volumes of patients, the concept of patient segmentation is becoming popular as a flow strategy.[13] Patient segmentation means grouping patients requiring similar levels of care and having similar anticipated lengths of stay (LOS) into a geographic area with dedicated staff and resources. The earliest example of patient segmentation is Fast Track, which now has a very compelling body of literature behind it.[14] Other newer examples of patient segmentation include:

- Geriatric ED
- Chest pain center
- Pediatric ED
- Critical decision unit
- Observation unit
- SuperTrack

SuperTrack was pioneered by Jody Crane, MD, in the Mary Washington Hospital Emergency Department in Fredericksburg, Virginia, as part of a complete patient-flow makeover.[7] The Mary Washington ED was seeing more than 100,000 visits when it opened its new doors in 2006 and was plagued with front-end waits and delays. As part of a complete overhaul of its ED patient flow, Crane and his colleagues
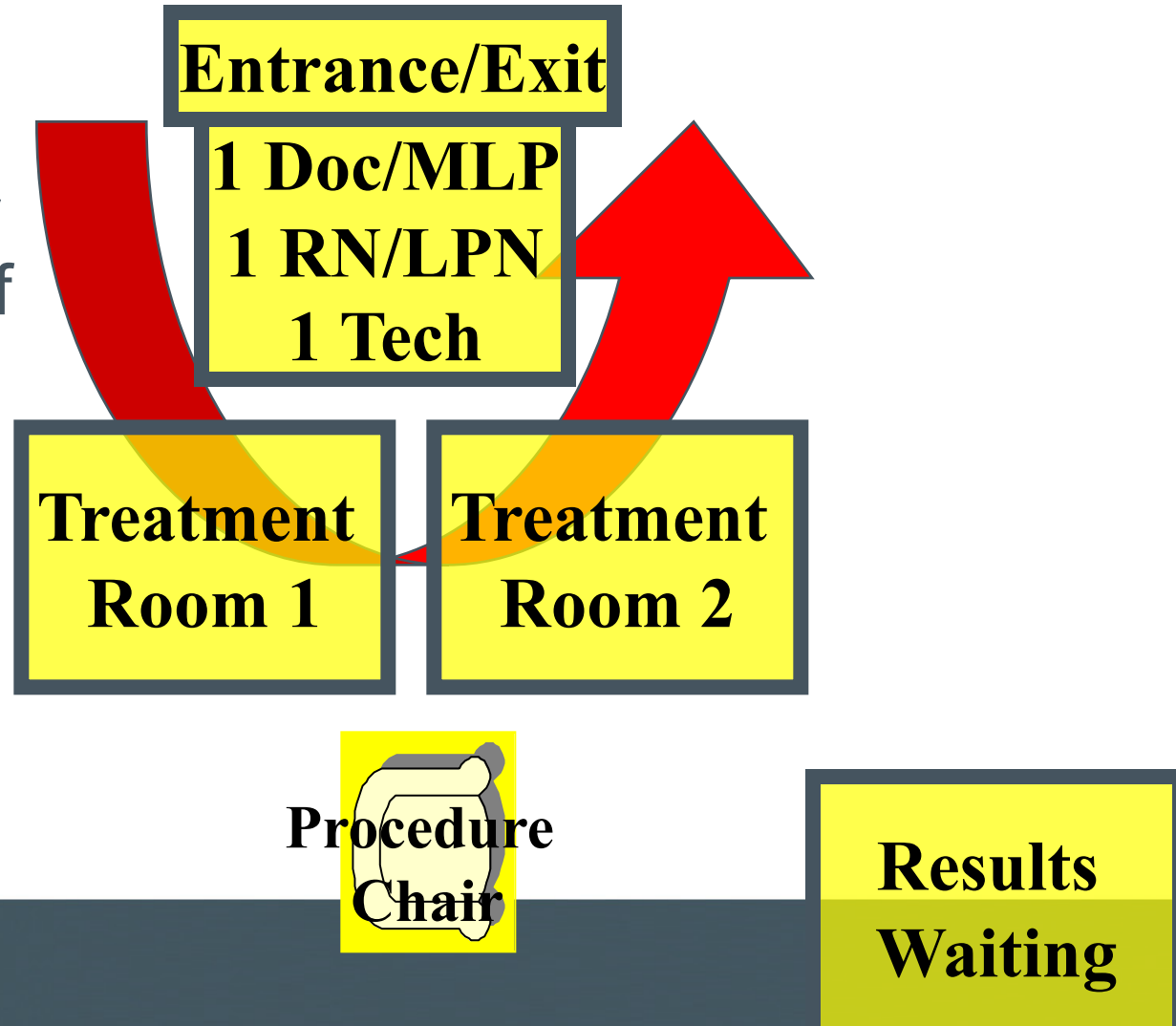
acuity patients (Emergency Severity Index Level 5). It dedicated six rooms as SuperTrack from 8 a.m. to 6 p.m., where identified patients would be seen by a patient care team con-

Once patients were found to meet the SuperTrack criteria, they were quickly placed in a room, and a patient care tech (PCT) would expedite this process and alert the pro-

plies, and staff dedicated to the care of very low-acuity patients, Parkland UCED improved all of its performance metrics, improved the overall flow of the department, and
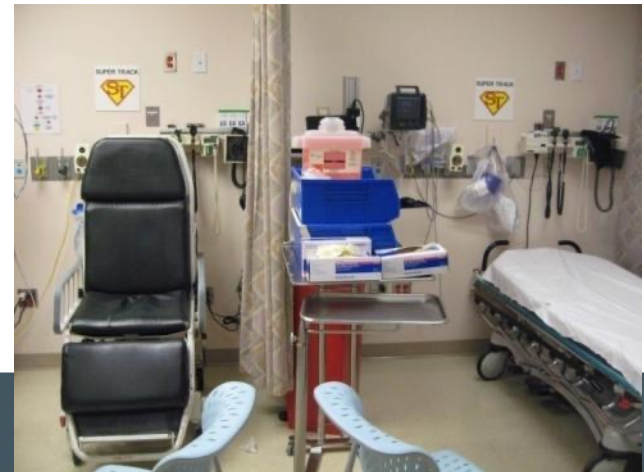
"Super Track"

- Fast Track located _in or near triage_ for the purpose of promptly treating patients who require very low resource utilization

4.5 x RN, 2 x Doc

Entrance/Exit

1 Doc/MLP
1 RN/LPN
1 Tech

Treatment Room 1

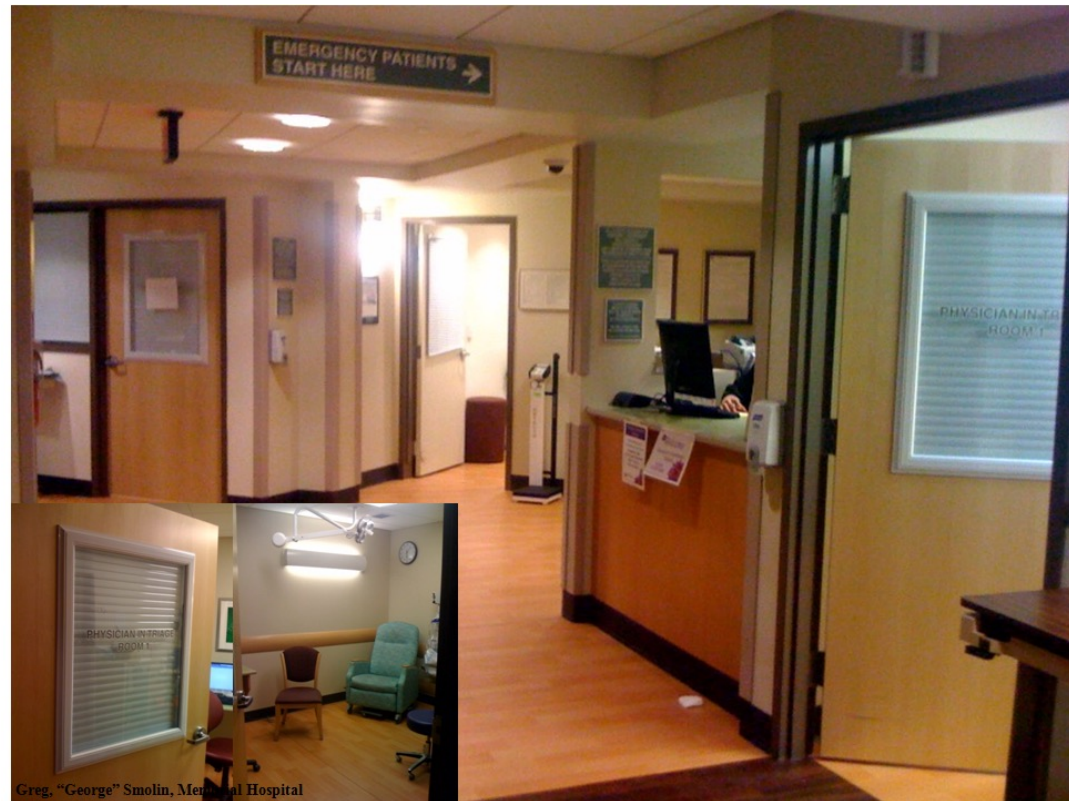**Treatment Room 2**

Procedure Chair

Results Waiting

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Rapid Medical Evaluation

- Physician in Triage
- Discharging all mid/lower acuity patients
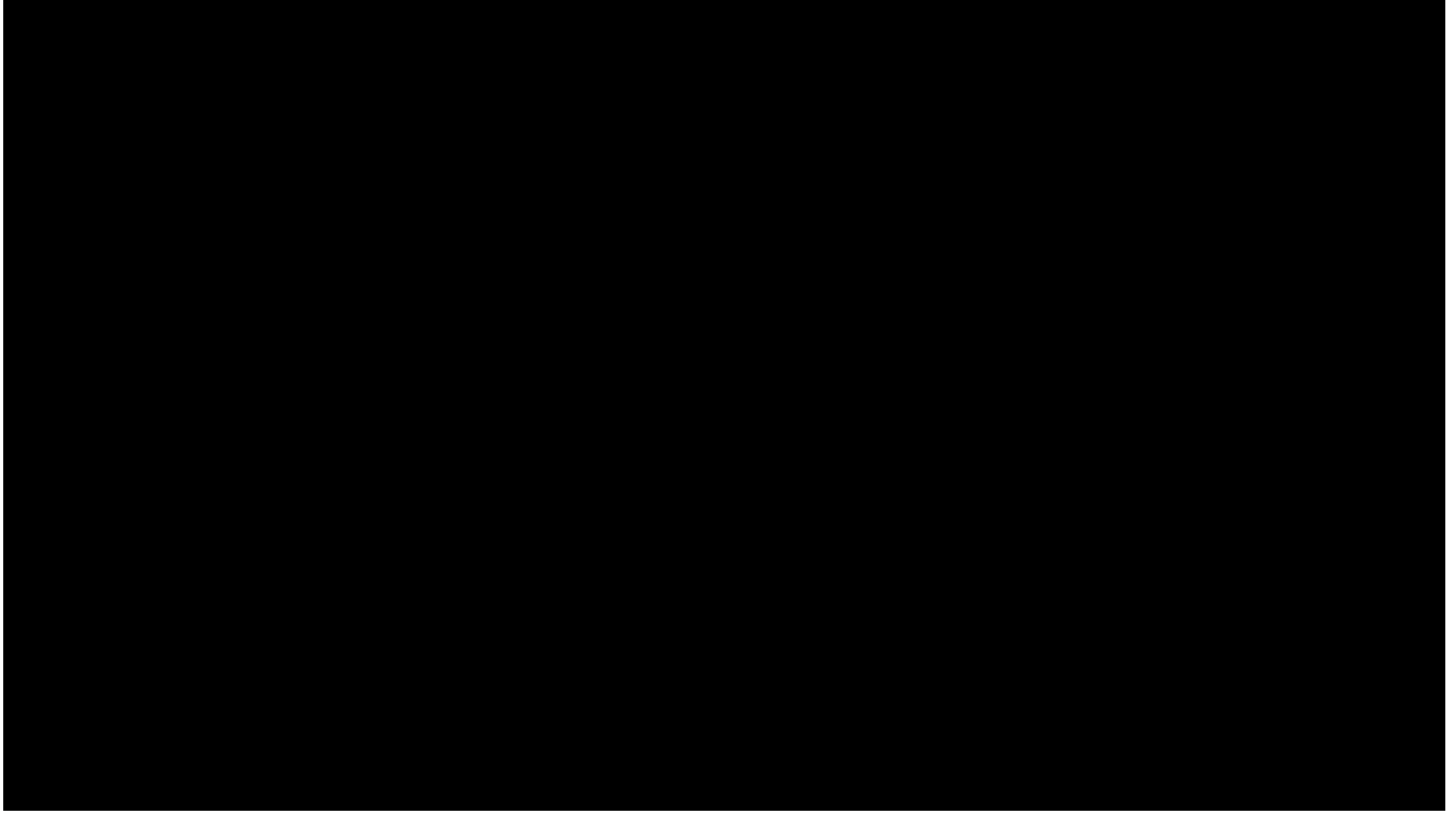- Getting things started on all other mid and high acuity patients that may experience bed delays

Greg, "George" Smolin, Memorial Hospital

4 x RN, 1.5 x Doc

"NP Triage"

Triage area staffed only by Nurse Practitioners who treat and release low acuity patients and streaming/triaging higher acuity patients to other areas in the ED
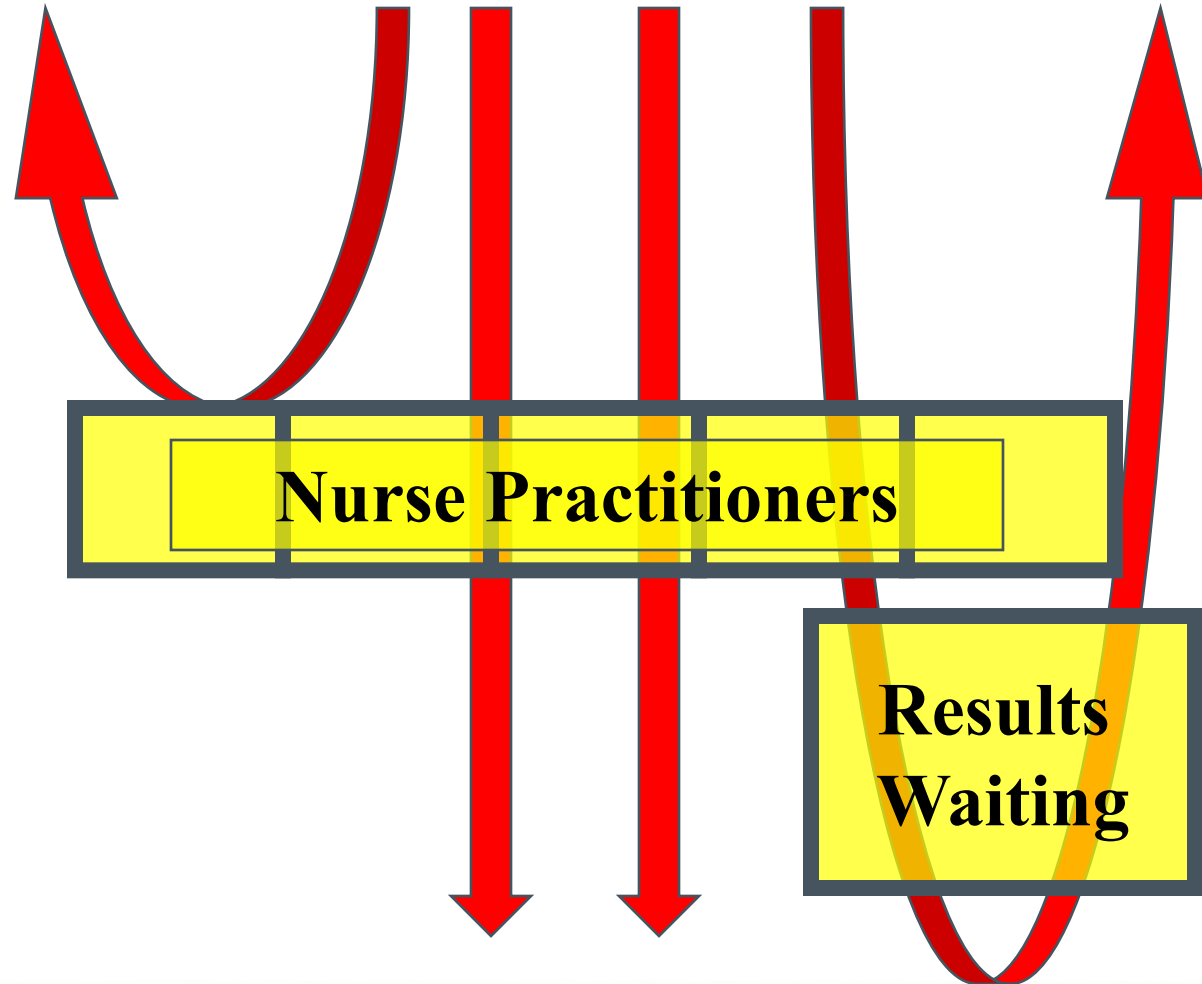
Nurse Practitioners

Results Waiting

Banner Split Flow

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Intake Systems

- Team of providers utilizing an "intake team" mentality for promptly assessing, treating, and discharging level 3 patients

3.5 x RN, 1.5 x Doc

Quick Look Quick Reg

Mary Washington Hospital "RATED-ER" design

Quick Triage

2 Providers (Doc/MLP), 2 RN/LPN,1 Paramedic 2 Scribes, 1PSR/HUC

5 Rooms

Treatment Area
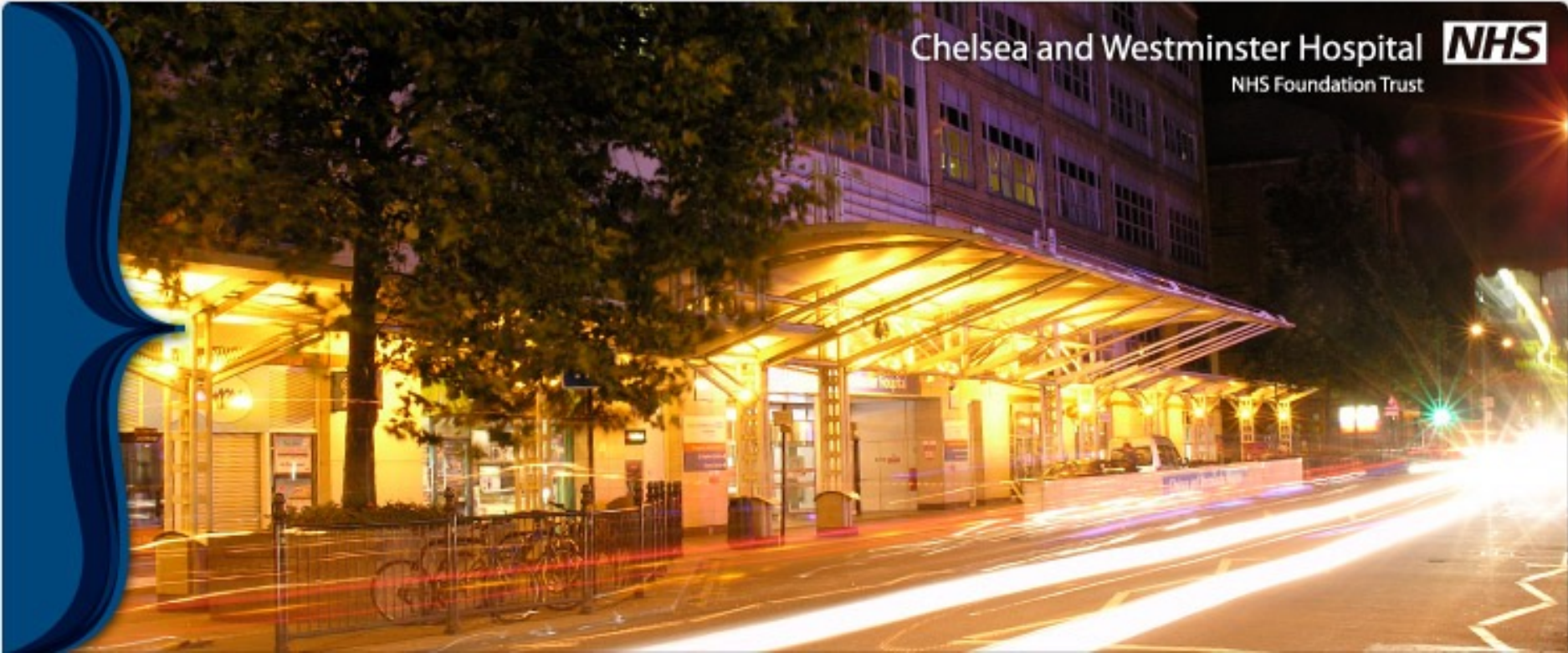
Results Waiting

What's Next? Self Checkout?

Triage Direct Admit?

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Volume Bands and Segmentation

- Depends on multiple factors including volume, teaching, trauma, ESI distribution

- *Rough* volume bands

  - 0 – 30,000

    Not much room for segmentation, high risk for idle servers, can still engage similar process

  - 30,000 – 50,000

    Intake strategy (ESI 3,4,5) vs. Super Track (ESI 4,5) – Depends on acuity

  - 50,000 – 60,000 +

    Combinations of Intake and low acuity and further segmentation become more effective
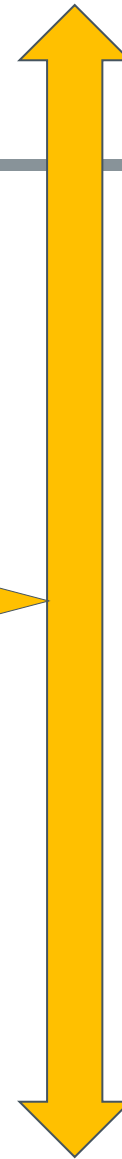
Single Stream

< 30k

Small

High Acuity

Easy

Complicated

Sick

1 Stream or 2 Streams? 20K ED

- Depends on % ESI 4,5 and % ESI vertical 3

4 pts/hr

	%
ESI 1	1%
ESI 2	20%
ESI 3	50%
ESI 4	25%
ESI 5	4%
% ESI v3	33%

Low   1.2 pts/hr
V3   0.7 pts/hr
High 2.1 pts/hr

1. Doc+APC , Single Stream with designated low acuity rooms

- Depends on % ESI 4,5 and % ESI vertical 3

4 pts/hr

	%
ESI 1	1%
ESI 2	10%
ESI 3	40%
ESI 4	45%
ESI 5	4%
% ESI v3	33%

Low 2.0 pts/hr
V3   0.5 pts/hr
High 1.5 pts/hr

1. APC, Vertical – 2.5 pph
2. Doc, Main ED – 1.5 pph
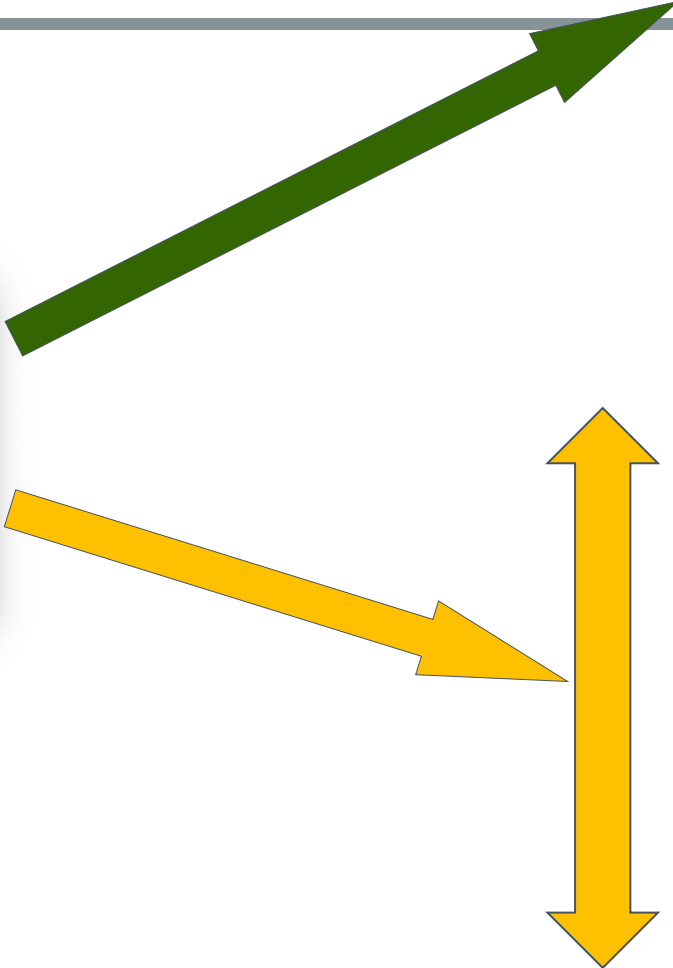
2 Streams – Low and High

30k-60k

Medium

Low Acuity

Easy

Complicated

Sick

2 Streams or 3 Streams? 30K ED

● Depends on % ESI 4,5 and % ESI vertical 3

6 pts/hr

	%
	%
ESI 1	1%
ESI 2	10%
ESI 3	50%
ESI 4	35%
ESI 5	4%
% ESI v3	33%

Low   2.4 pts/hr
V3   1 pts/hr
High   3 pts/hr

1. **APC, Fast Track/Super Track – 2.4 PPH**
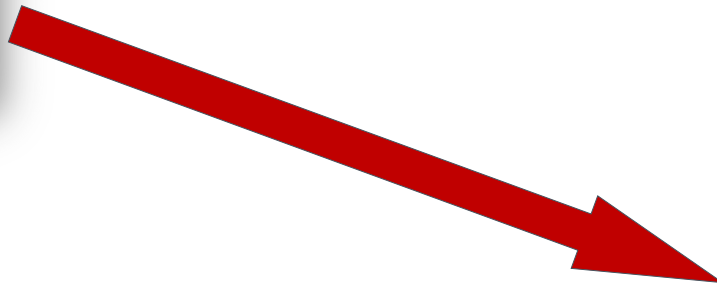2. **2 doc, High Acuity Main ED – 4pph**

2 Streams – Split Flow

30k-60k

Medium

High Acuity

Easy

Complicated

Sick

2 Streams or 3 Streams? 30K ED

- Depends on % ESI 4,5 and % ESI vertical 3

6 pts/hr

	%
ESI 1	1%
ESI 2	20%
ESI 3	50%
ESI 4	25%
ESI 5	4%
% ESI v3	66%

Low   **2 pts/hr**

V3   **2 pts/hr**

High   **2 pts/hr**

1. **Insufficient Demand for Fast Track/Super Track**
2. **Split flow**
   1. **Doc, APC, Vertical – 4 pts/hr**
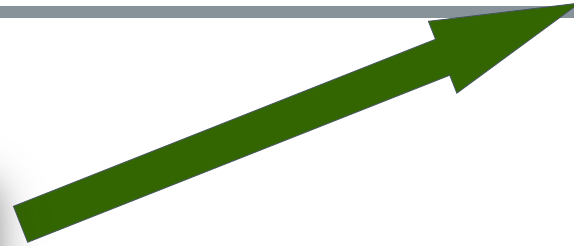   2. **Doc, Horizontal – 2 pts/hr**

3 Streams – Low, Mid, High

> 60k

Large
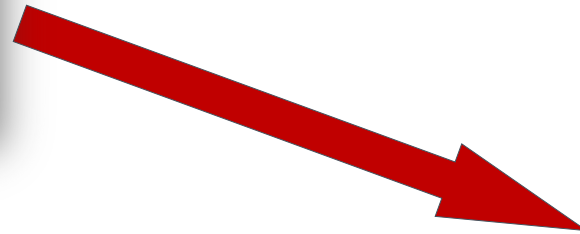
<u>Any</u> Acuity

Easy

Complicated

Sick

2 Streams or 3 Streams? 60K ED

- Depends on % ESI 4,5 and % ESI vertical 3

12 pts/hr

	%
ESI 1	1%
ESI 2	14%
ESI 3	60%
ESI 4	21%
ESI 5	4%
% ESI v3	33%

Low   3 pts/hr
V3   2.4 pts/hr
High 6.6 pts/hr

1. APC, Fast Track/Super Track
2. Doc, Provider in Triage
3. 3-4 Doc, Main ED

2 Streams or 3 Streams? 60K ED

- Depends on % ESI 4,5 and % ESI vertical 3

12 pts/hr

	%
ESI 1	1%
ESI 2	14%
ESI 3	60%
ESI 4	21%
ESI 5	4%
% ESI v3	33%

Low   3 pts/hr
V3   4.3 pts/hr
High   4.4 pts/hr

1. APC, Fast Track/Super Track
2. 2 Doc, Intake
3. 2-3 Doc, Main ED

2 Streams or 3 Streams? 60K ED

● Depends on % ESI 4,5 and % ESI vertical 3

12 pts/hr

	%
	%
ESI 1	1%
ESI 2	14%
ESI 3	60%
ESI 4	21%
ESI 5	4%
% ESI v3	60%

Low   3 pts/hr
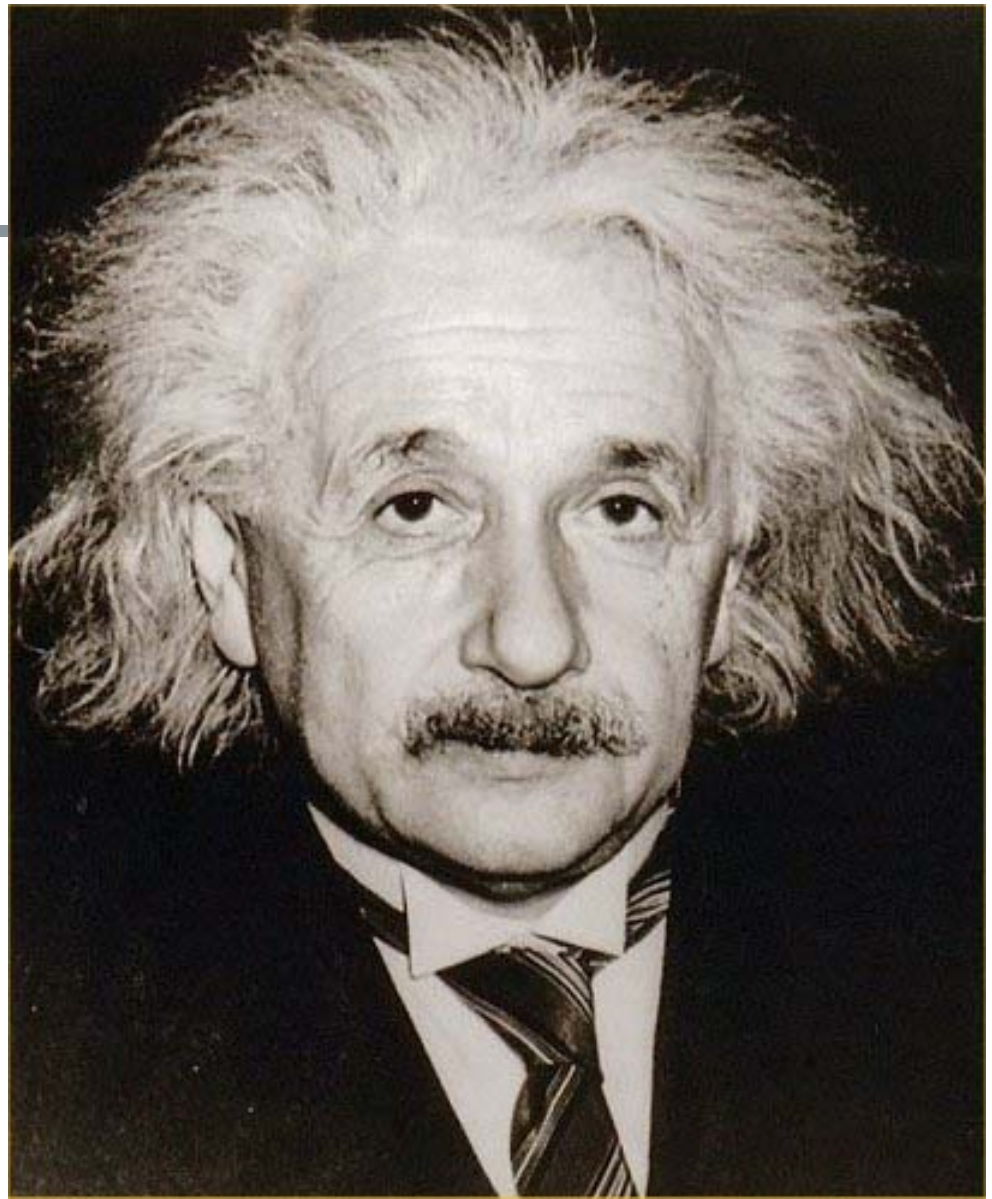**V3   4.3 pts/hr**
High   4.4 pts/hr

1. **1 Doc, 2 APC Vertical – ESI 4, 5, 3v**
2. **3 Doc, Main ED – ESI 1, 2, 3h**

Problems cannot
be solved by the
same level of
thinking that
created them

-Einstein

Conclusions

- Effective front-end solutions involve understanding your types of patients and streaming them through pathways where they will receive the most efficient care.

- Employing strategies such as results waiting areas, point of care testing, and effective special design.

- The different models described have specific settings where they will be most effective based on volume and acuity.