

# Harnessing available resources to enhance the quality of decision making in Transfusion Medicine



*Dr. Anila Mathan*

*Sr. Consultant Haematology & Transfusion Medicine*

*Apollo Speciality Hospitals , Chennai*

# What is Optimisation

- An act, process, or methodology of making something (a design, system, or decision) as fully perfect, functional, or effective as possible.
- Finding an alternative with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones.

# A simpler definition

- Optimisation should modify a system to make some or all aspects of it to work more efficiently or use fewer resources.

Macro level  
Meso level  
Micro level

# Define the services provided

- Medium Sized Blood Bank : 24/7 located a little outside the city
- Resources :
  - Donation facilities (Difficulty due to location – Accession )
  - 100% Component preparation
  - Whole blood only at request
  - 100% Leucodepletion
  - Maximum usage by Cardiac and Neurosurgery
  - Screening as per regulations : HIV , HCV, HBsAg & Core antibody , VDRL and Malaria .
  - NAT : Centralised : Time factor ??

# Problems faced

- Increasing the donor pool : Supply vs demand issues especially for rare groups
- Increased wastage of products : PRBC , Platelets
- Clinical decision making ?
  - Transfusion for Dengue positive even with 60,000 and no evidence of bleeding
  - Transfusion with 8.5 gm/dl of Hb

# Could we optimise ?

- How do we assess the blood bank to achieve this Optimisation
- Resources:
  - Lab facilities
  - Clinical resources
  - Voluntary Organisations /Donor Pool
  - Collaborations - Within the Organisation / Blood Storage Centres

What are the strategies for recruiting these resources to optimise the BB :

What did we do :

- 1) Process Optimisation
- 2) Product Optimisation
- 3) Evidence Based Optimisation



# Process Optimisation

**Process optimisation** is the discipline of adjusting a process so as to optimise some specified set of parameters without violating some constraint. The most common goals are minimizing cost and maximizing throughput and/or efficiency. This is one of the major quantitative tools in decision making.

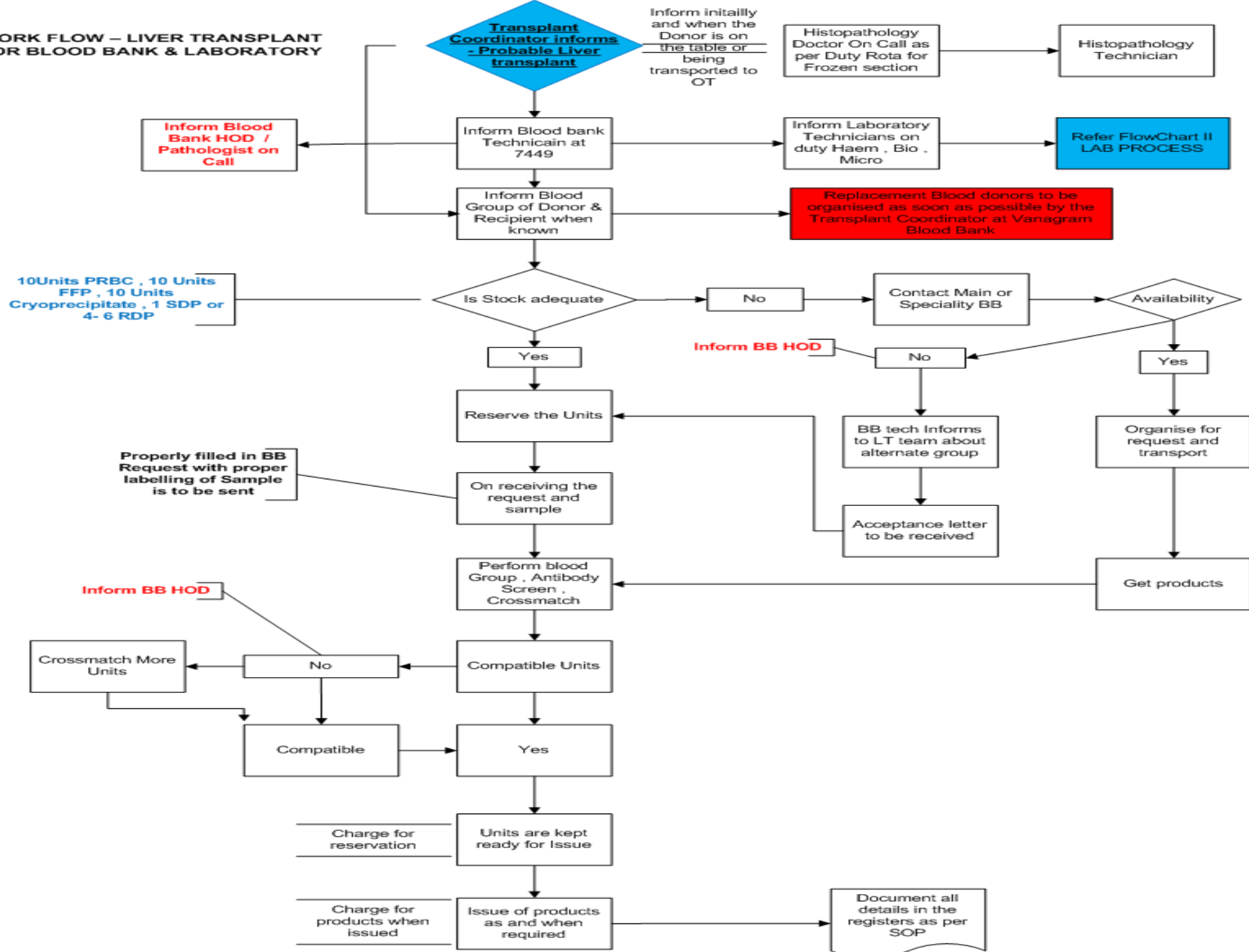


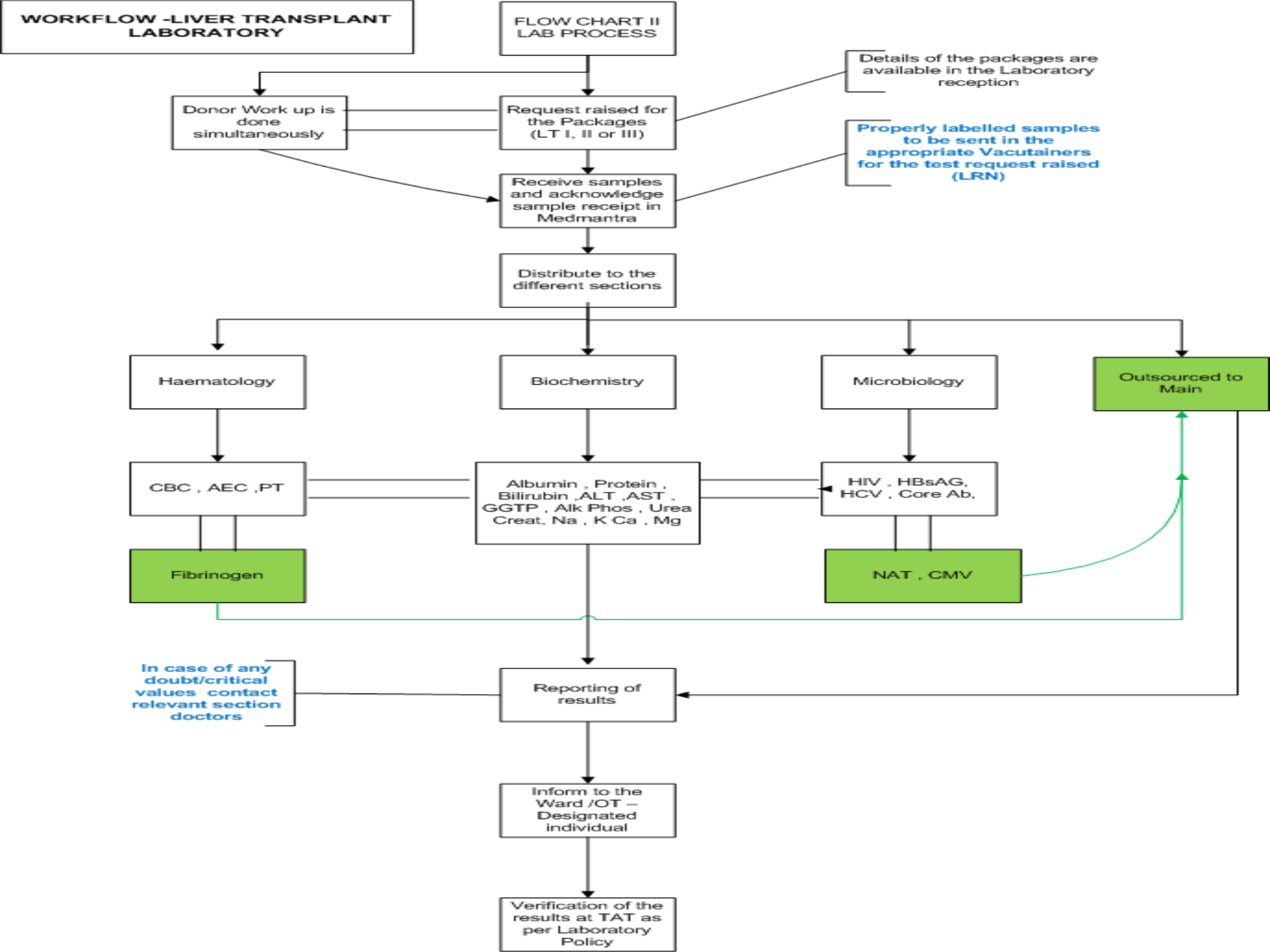
# How did we implement :

## Example

- Liver Transplant
- No idea .... Novices
- Did not have many of the tests requested by the Clinician : Lab
- Underwent lots of issues for the first 3 transplants : Lots of Units stocked as per request and not used ....
- Then brainstormed and came up with a protocol .....

**WORK FLOW – LIVER TRANSPLANT FOR BLOOD BANK & LABORATORY**





- We had a understanding with the other Apollo blood banks to support us if required .
- We organised for transport to be ready so that we reserved the units but transported only if required so that we were not left with unused units .
- We discussed with the anaesthetist and correlated results with the products asked so that it was more evidence based
- We did this for other areas also .

# Product Optimisation



# Cardiac Surgery

- Initially we had products issued and then not utilised in OT
- This led to wastage of PRBC
- Declining of PRBC stock

- We had a mobile Refrigerator: temperature controlled in OT
- Validated transport , storage and return
- Protocol defined for return
- Under BB control
- Reusage of RBC possible

Cost & benefit for patient  
Removed cost of PRBC from the package so the patient benefited by being charged only for what was used



# Other optimisation techniques

- Centralised source : Apheresis  
Avoided wastage of short expiry products due to non usage
- Education of Clinicians on safe alternatives so that expiry of products could be reduced
- **Macro Level** :Centralisation & Regionalisation Many countries have centralised supply : Will we ever achieve this ?  
UK National Health. Australia etc

Is it possible to statistically model supply and demand to optimise utilisation:

- A few (4-5 ) articles have described statistical algorithm based strategies to predict demand supply relationships.
- Large – Macro and Meso levels with perfect administrative coordination
- Is it feasible in our country ?
- Tried in an Italy – Regional level with variable success

DeAngelis & Storchi 2001



# Evidence based Optimisation

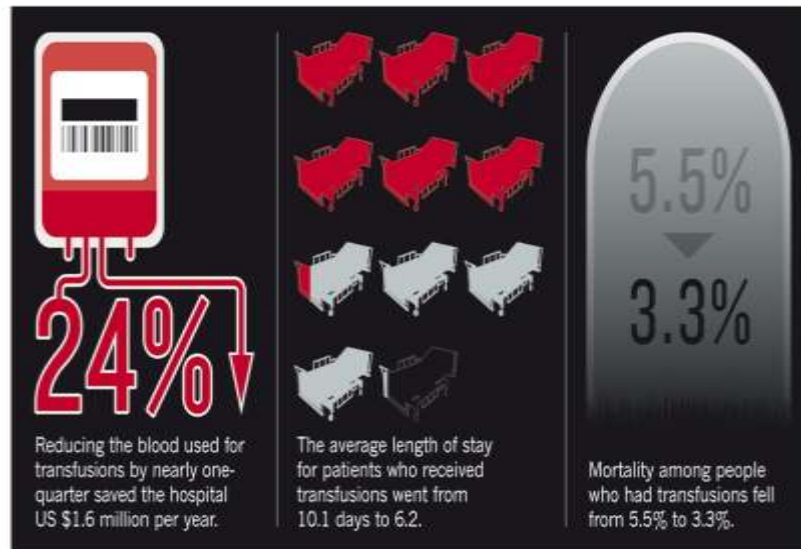


California 2009 : Whenever a clinician used the hospital's computerized ordering system to request blood, it would call up the patient's most recent lab results

If the numbers indicated that she or he should be healthy enough to get by without a transfusion, an alert would pop onto the screen gently reminding the doctor of the guidelines and requesting further justification for the order.

### DOCTOR'S ORDERS

By simply reminding doctors of the current guidelines when they order blood, a California hospital was able to save money and lives.



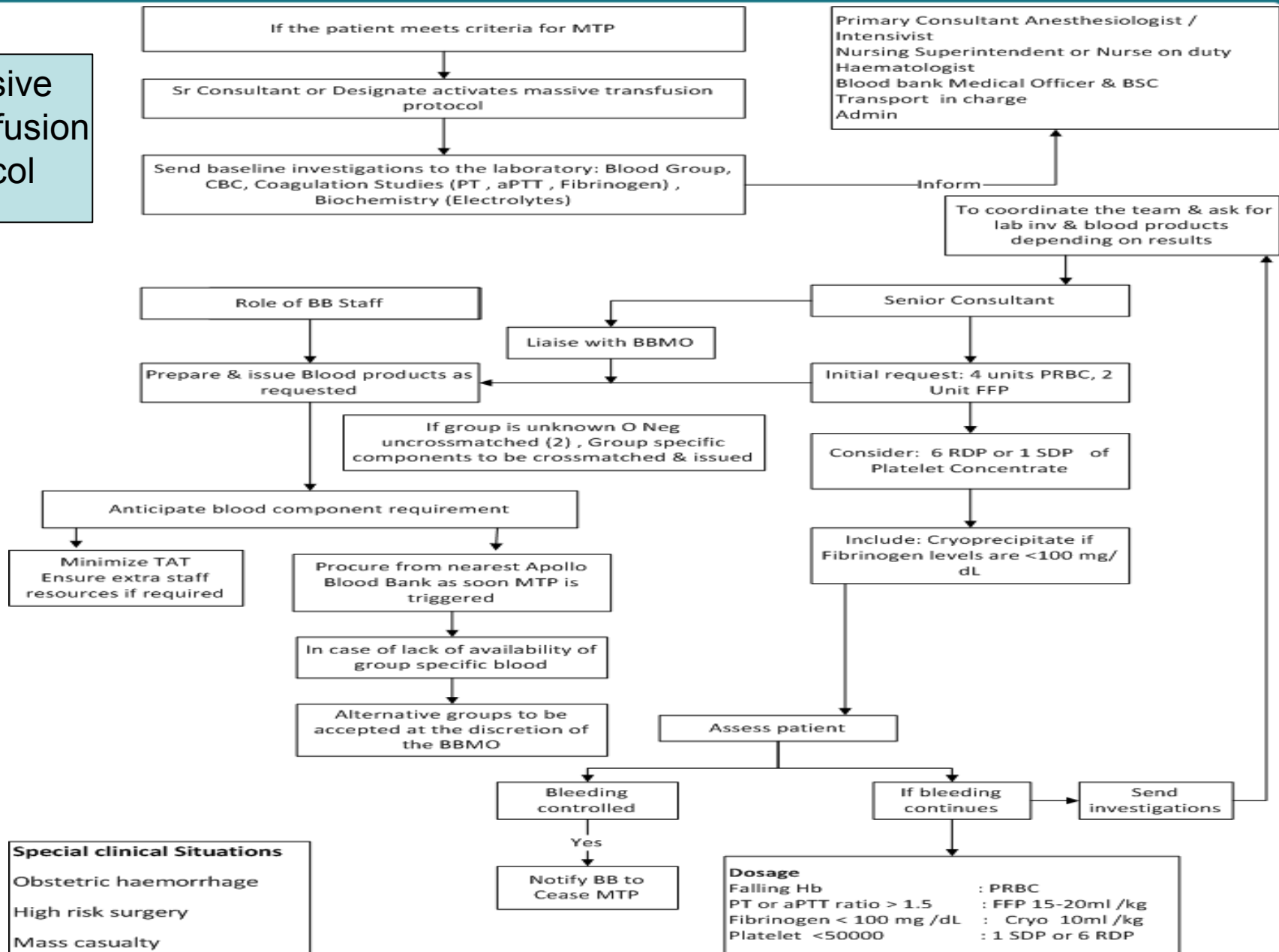
We used a similar technique but manually assessed the reports

Emily Anthes -2015

# What did we do

- Set limits based on literature and a clinical audit of utilisation in our blood bank
- Set up protocols for Massive transfusion  
Approved with clinical inputs and passed in the Hospital Transfusion Committee meeting

# Massive Transfusion Protocol



# 62 yr old lady admitted for evacuation of a Chronic Subdural Hematoma in the Fronto-temporo-parietal region .

Admitted with numerous co-morbidities

## Lab parameters :

Hb 11.6 Total Count : 10,400 ,Normal Differential Plt : 3,35,000

PT : 13.8/11.2 , INR 1.18

aPTT : 51 sec C :25 sec

½ Pt ½ control showed good correction , Since it was brain surgery we did not want to take a chance so we went on to do further studies

There was no bleeding history or family history of bleeding .

She was on medication aspirin and clopidogrel which had been stopped. Patient was on antiepileptics, antihypertensives

BT : 4 mts , Repeat aPTT showed similar results .Factor assays for 8 and 9 were normal .

Conclusion : ? Drug related /? antiepileptics

Since the aPTT was correcting and we could not find a cause .The Neurosurgeon went on with the evacuation under FFP coverage with no problems .

Evidence based transfusion medicine is a challenge but doable



The difference between  
*something good* and  
*something great*  
is attention to detail



*Thank You*