Transfusion Reactions – A Clinical Perspective

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Simon Goodwin,
Specialist Practitioner in Transfusion,
Surrey & Sussex Healthcare NHS Trust

Quick Show of Hands:
What is ‘Expert’ Healthcare?

1. Purely a SCIENCE
2. Purely an ART
3. Combination of SCIENCE & ART

Other factors in the Mix

- Context
  - Underlying Pathology
  - Psychological State
- Environmental Context
  - Quiet / Busy / Time of Day
  - Maturity of HCP relationship
- Assessment Skills
  - Knowledge of Transfusion Reactions

What is a Blood Transfusion?

- Professor John Forsythe,
- Consultant Transplant Surgeon,
- Royal Infirmary of Edinburgh &
- Chair of SaBTO.
- ‘Blood Transfusion is a Human Tissue Transplant’

Measures to make Transfusion Safer

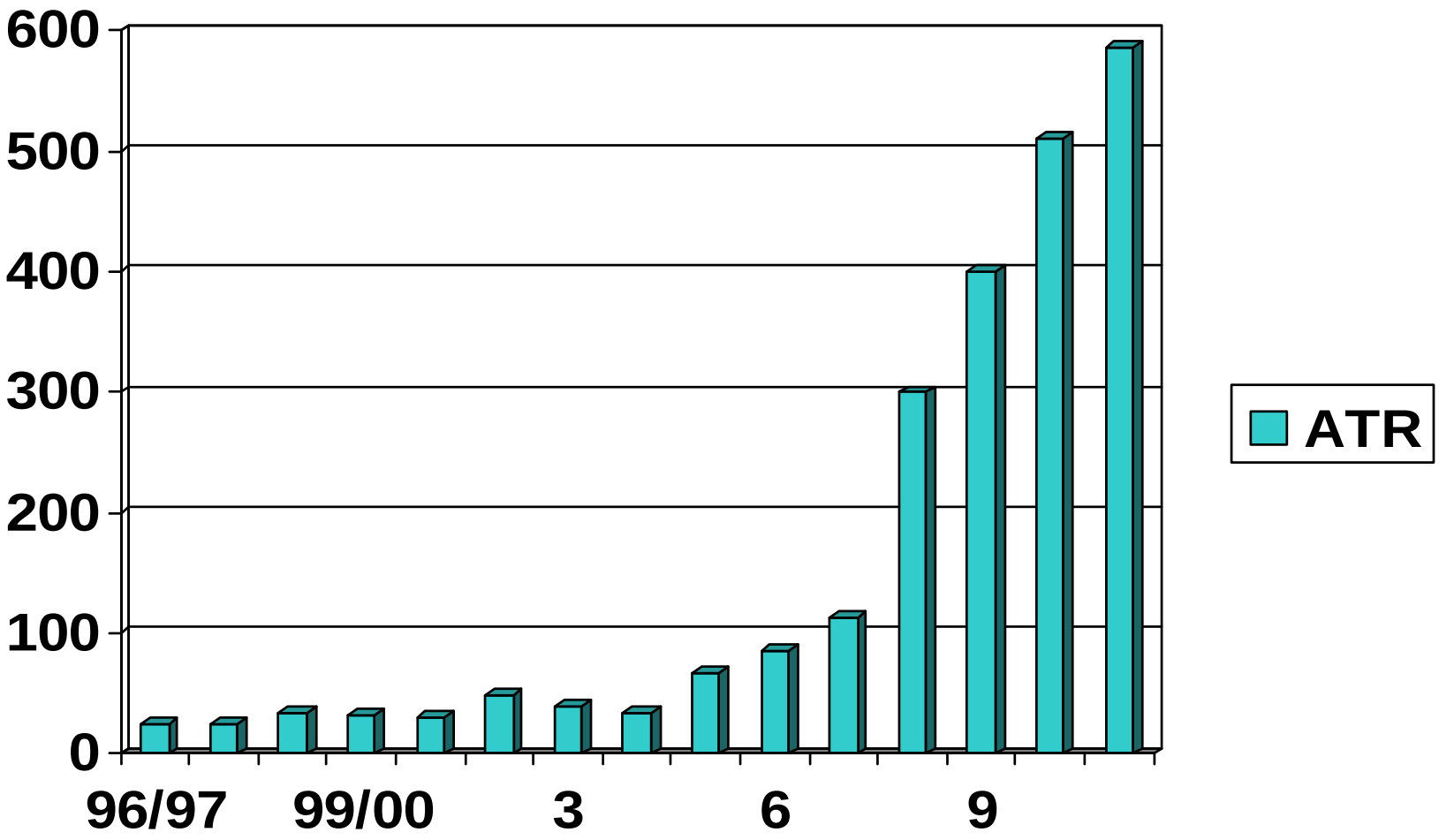
- **Donor Screening**
  - **Health & Lifestyle Questionnaire**
  - **Virology Testing**
  - **? Future Nv-CJD**
- **Leucocyte Depletion**
  - **Said far less Febrile reactions, more mild**
  - **No Nv-CJD infection we know of**
  - **Recent changes to CMV Neg requirements**
- **FFP male only donors**
  - **TRALI rare complication**

Very significant ‘foreign’ human tissue

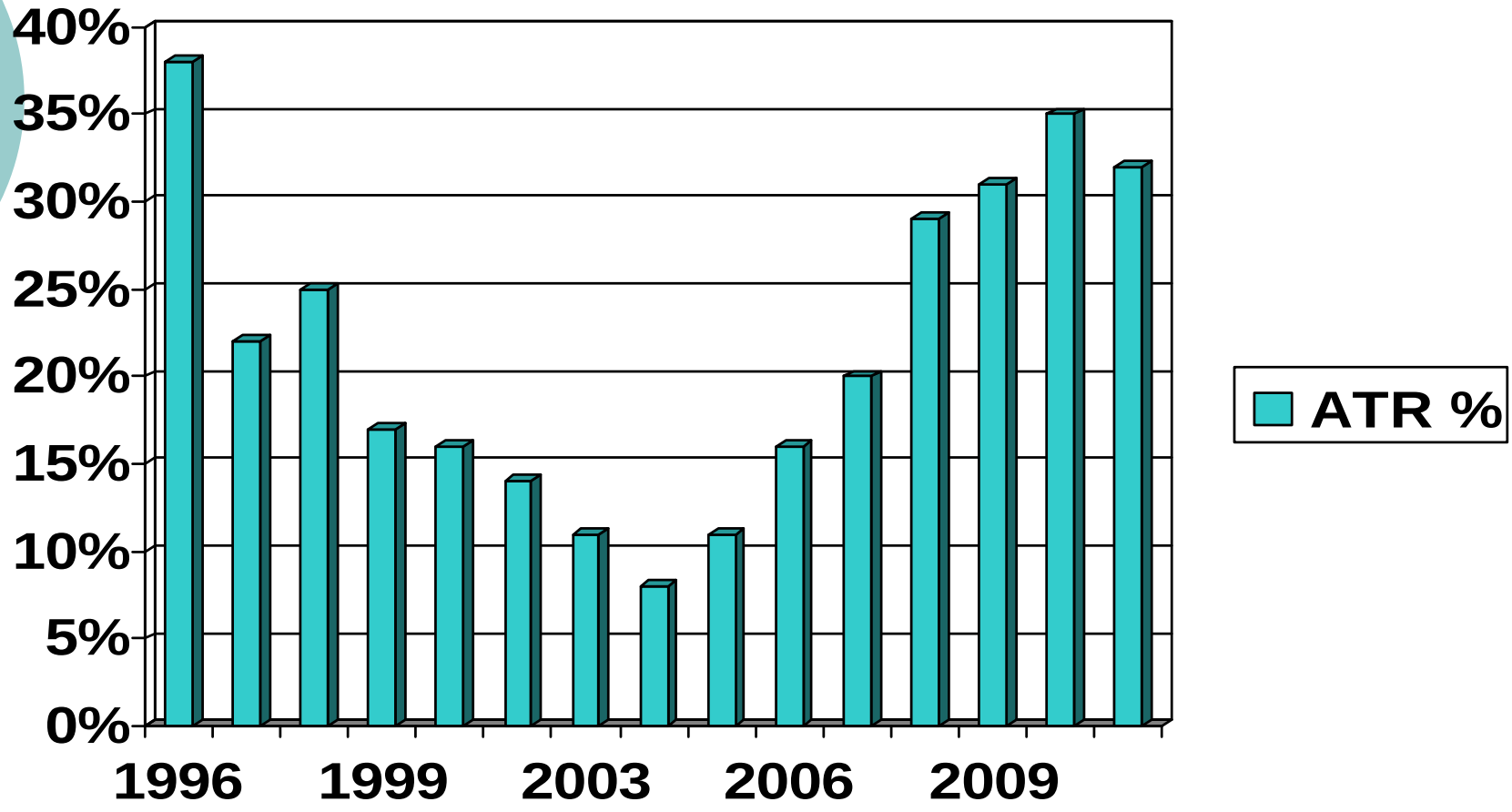
Transfusion Reactions

- Mechanical
  - TACO or TAD
- ALL remaining reactions are IMMUNE
  - Acute
  - Delayed
  - Chronic

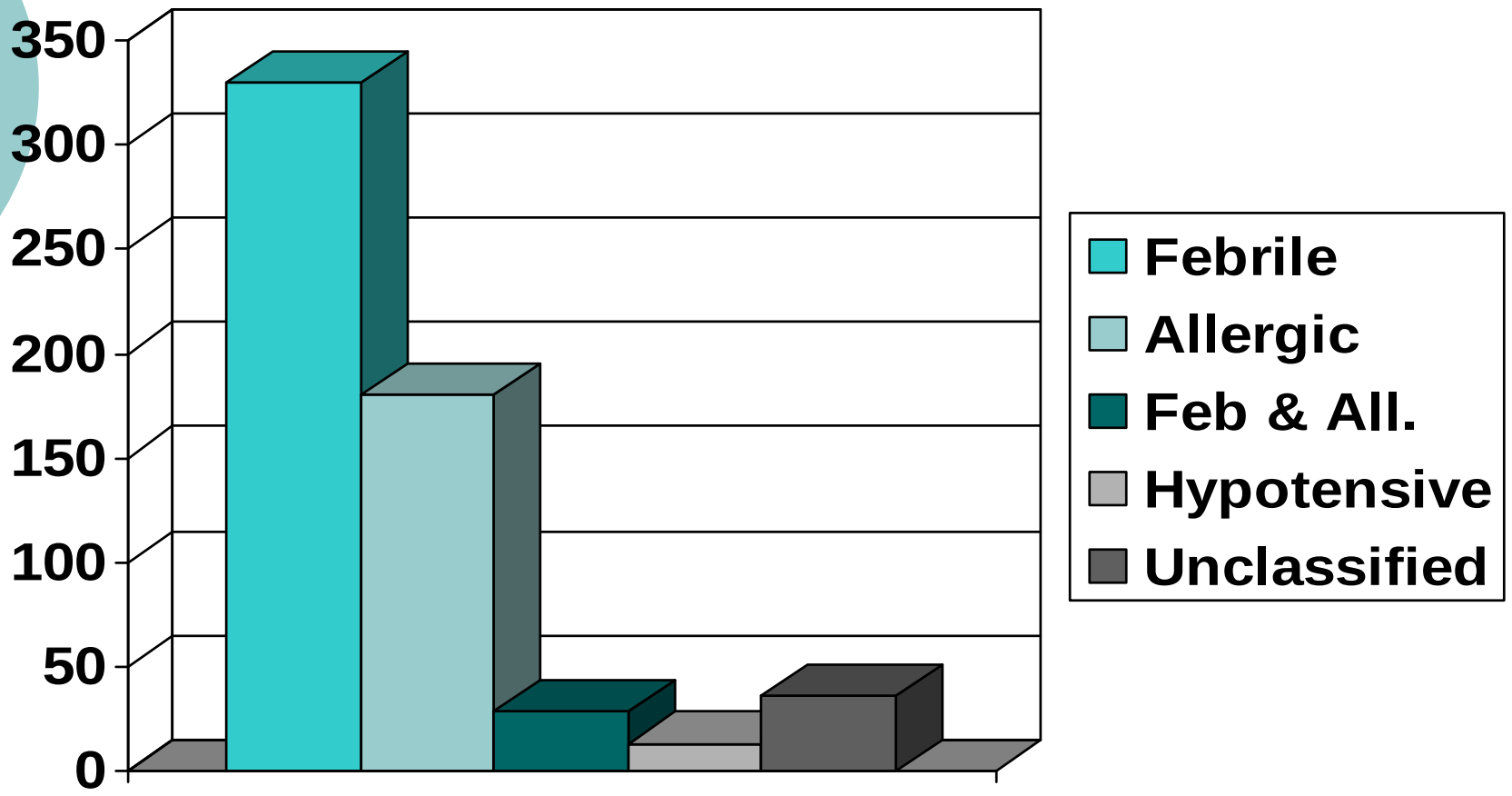
ATR to SHOT since 1996



ATR as %age of SHOT Reports



Types of ATR 2011



Introducing Consistency: Assessment Tools

Handbook of Transfusion Medicine

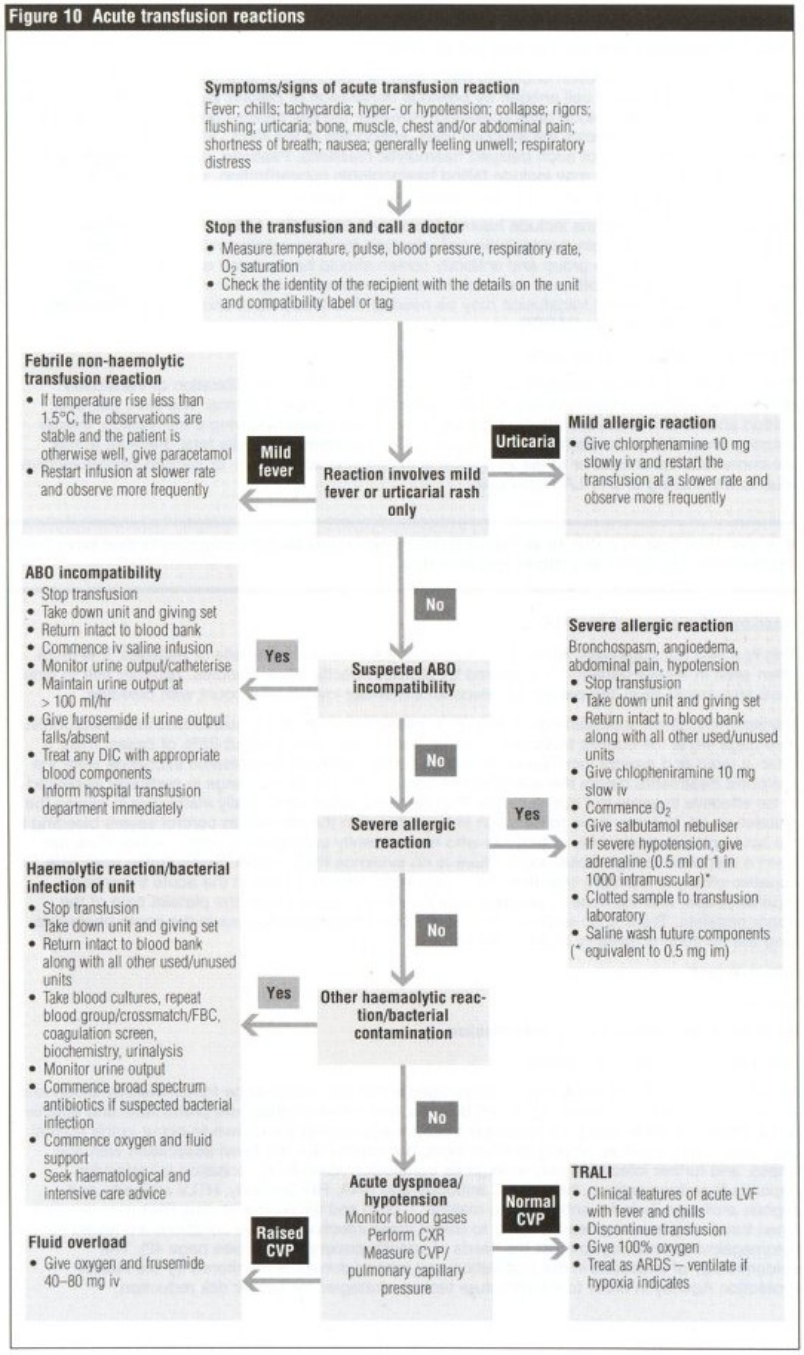
4th Edition 2007

(DBL McClelland)

Flowchart:

Management of severe acute reaction.

Figure 10 Acute transfusion reactions

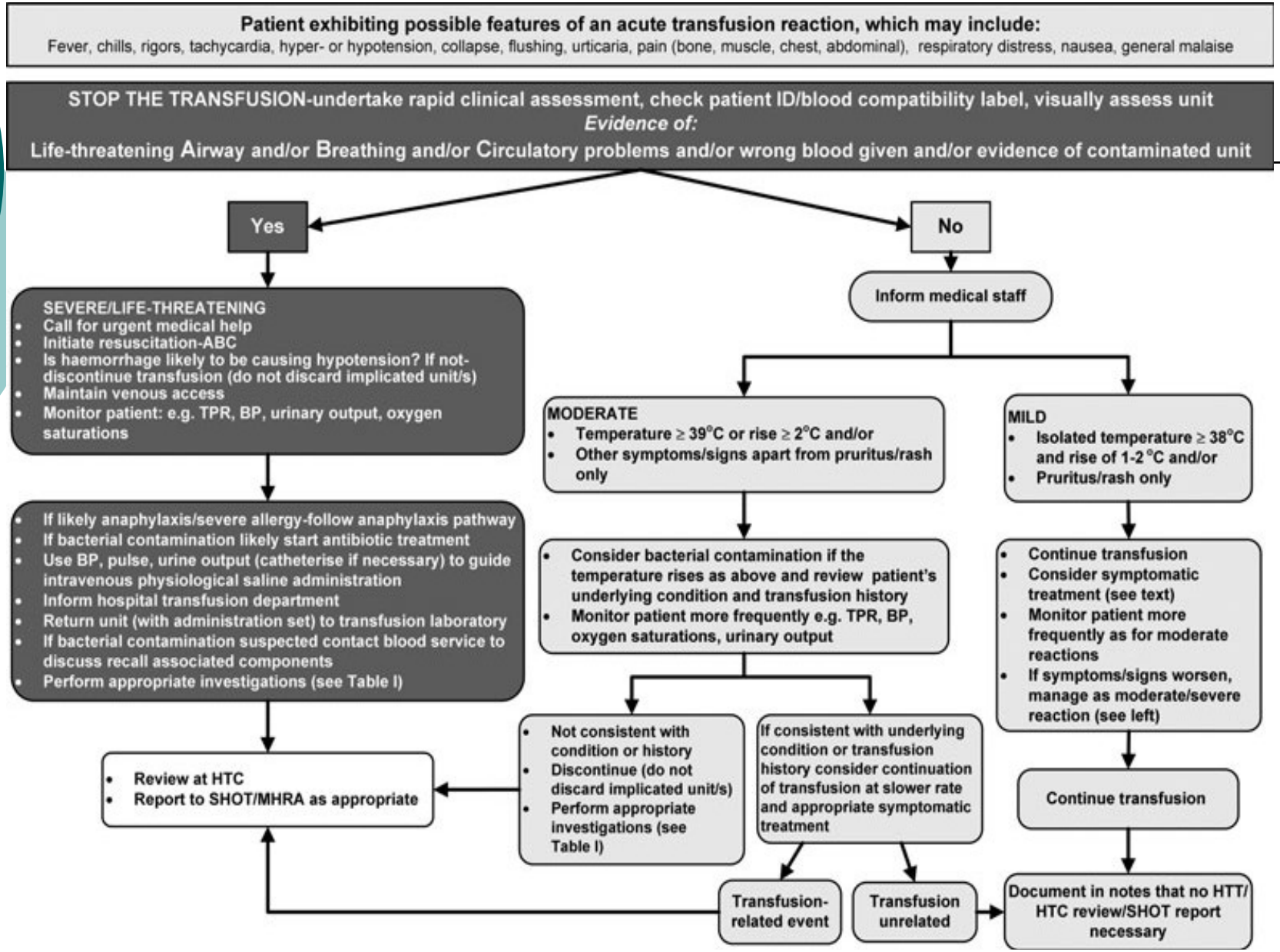


BCSH Guideline on the Investigation & Management of ATR 2012

- **Oxford Systemic Reviews Initiative**
  - **1080 Systemic Reviews**
  - **878 Observational Studies**
  - **Grade system**
  - **i.e. they did their homework**
- **Clear Guidance**
  - **Recognition**
  - **Investigation**
  - **Management (especially life threatening)**

BCSH Guideline on the Investigation & Management of ATR 2012

- **Precise Nature / Severity may not be apparent at presentation**
- **Taxonomy**
  - **Severe Reactions**
  - **Moderate Reactions**
  - **Mild Reactions**
- **Laboratory Investigations**
  - **Moderate & Severe Standard battery of tests**
    - **FBC / Renal & Liver function / Urine for Hb**
  - **Moderate & Severe Febrile symptoms**
    - **DAT / LDH / Haptoglobin**
  - **Urgency needs to be communicated**
  - **Bacterial contamination / Agents of haemolysis**
    - **Inform NHSBT**


Patient exhibiting possible features of an acute transfusion reaction, which may include:
Fever, chills, rigors, tachycardia, hyper- or hypotension, collapse, flushing, urticaria, pain (bone, muscle, chest, abdominal), respiratory distress, nausea, general malaise
STOP THE TRANSFUSION-undertake rapid clinical assessment, check patient ID/blood compatibility label, visually assess unit
Evidence of:
Life-threatening Airway and/or Breathing and/or Circulatory problems and/or wrong blood given and/or evidence of contaminated unit
Yes
No
SEVERE/LIFE-THREATENING
Call for urgent medical help
Initiate resuscitation-ABC
Is haemorrhage likely to be causing hypotension? If not-discontinue transfusion (do not discard implicated unit/s)
Maintain venous access
Monitor patient: e.g. TPR, BP, urinary output, oxygen saturations
If likely anaphylaxis/severe allergy-follow anaphylaxis pathway
If bacterial contamination likely start antibiotic treatment
Use BP, pulse, urine output (catheterise if necessary) to guide intravenous physiological saline administration
Inform hospital transfusion department
Return unit (with administration set) to transfusion laboratory
If bacterial contamination suspected contact blood service to discuss recall associated components
Perform appropriate investigations (see Table I)
Review at HTC
Report to SHOT/MHRA as appropriate
Inform medical staff
MODERATE
Temperature ≥ 39°C or rise ≥ 2°C and/or
Other symptoms/signs apart from pruritus/rash only
MILD
Isolated temperature ≥ 38°C and rise of 1-2 °C and/or
Pruritus/rash only
Consider bacterial contamination if the temperature rises as above and review patient's underlying condition and transfusion history
Monitor patient more frequently e.g. TPR, BP, oxygen saturations, urinary output
Continue transfusion
Consider symptomatic treatment (see text)
Monitor patient more frequently as for moderate reactions
If symptoms/signs worsen, manage as moderate/severe reaction (see left)
Not consistent with condition or history
Discontinue (do not discard implicated unit/s)
Perform appropriate investigations (see Table I)
If consistent with underlying condition or transfusion history consider continuation of transfusion at slower rate and appropriate symptomatic treatment
Continue transfusion
Transfusion-related event
Transfusion unrelated
Document in notes that no HTT/HTC review/SHOT report necessary

Current IHN / SHOT / BCSH classification of acute transfusion reactions

	1 = Mild	2 = Moderate	3 = Severe
Febrile type reaction	T ≥38ºC, ↑1-2ºC No other symptoms / signs	↑2ºC, T ≥39ºC, rigors, chills, inflammatory signs, myalgia, nausea	As moderate but transfusion stopped AND/OR prolong hospital stay
Allergic type reaction	Transient flushing, urticaria or rash	Wheeze, angiodema, (flushing, urticaria or rash) no respiratory compromise / hypotension	Bronchospasm, stridor, CVS problems ANAPHYLAXIS
Febrile & Allergic features	Features of both as above	Features of both as above, at least one Moderate	Features of both as above, at least one Severe
Hypotensive reaction		Isolated ↓ Systolic BP ≥30mm in 1st hour of end, Isolated Systolic BP ≤80mm	Hypotension → shock, acidaemia, vital organ impairment

Welsh BBT Team: Transfusion Guideline October 2012 - One

Symptoms / Signs	Mild	Moderate	Severe
Temperature	≥ 38ºC AND ↑1-2ºC	≥ 39ºC or ≥ 2ºC	Sustained symptoms
Rigors / shaking	None	Mild Chills	Obvious shaking / rigors
Pulse	Minimal or no change	↑10b/min NO Bleeding	↑20bpm NO Bleeding
Respirations	Minimal or no change	↑10/min	↑10/min or more, dyspnoea / wheeze
BP (Hypo/Hyper)	Minor or no change	Sys/Diast ≥30mm/Hg No Bleeding	Sys/Diast ≥30mm/Hg No Bleeding
Skin	No change	**Facial flushing, rash, urticaria, pruritis**	**Rash, urticaria & peri-orbital oedema, Conjunctivitis**
Pain	None	**General discomfort / Myalgia. Drip site pain**	Acute pain chest, abdomen, back
Urine	Clear normal output		Haematuria / Haemoglobinurea / Oliguria / Anuria
Bleeding	No new bleeding		Uncontrolled oozing
Nausea	None		Nausea or Vomiting

Welsh BBT Team: Transfusion Guideline October 2012 - Two

All Green	**STOP the transfusion but leave connected.** Re-check identity of the unit with the patient, inform doctor. If all well, continue at ~~reduced rate **for the next 30 minutes and then** resume at~~ prescribed rate. Continue to monitor patient carefully, be alert for other symptoms or signs of transfusion reaction. Anti-pyretics may be required
1 or more Amber	**STOP the transfusion but leave connected,** request urgent clinical review, re-check identity of the unit with the patient, give IV fluids. If symptoms stable or improving over next 15min consider re-starting the unit. Antihistamines and / or anti-pyretics may be required
1 or more Red	**STOP the transfusion and disconnect,** request immediate clinical review, re-check identity of the unit with the patient, give IV fluids, inform the transfusion laboratory, contact the Consultant Haematologist.

Welsh BBT Team: Transfusion Guideline October 2012 - Two

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Case Study One

- 24 yr old ♀ heavy PV bleeding
- 1 week post MTOP
- Massive Blood Loss Protocol
- Emergency surgery for ERPC
- Transfused 7 units PRC (4 x O neg, 3 x O Pos)
- Transfused 4 units FFP (O Pos)
- Next day
    - Sudden onset chest pain
    - PE ruled out by CT scan
    - TRALI queried but not acted upon

Case Study One

- Discharged 5 days later.
  - Hb 9.8g/dl & ‘minimal bleeding’
- Re-presented 8 days later (13 days later)
  - Hb 7.8g/dl
  - Reported feeling gradually weak
  - No PV bleeding
  - Nursing Notes ‘admitted with anaemia & jaundice’
  - Next day: Frank Haematuria
  - Hb continues to fall
  - Left flank / back pain
- All came to light on audit of MBLP, never reported to Lab.

Case Study Two

- 88 yr old ♀ with Inflammatory Bowel Disease
- Admitted as day case to small hospital
  - Current staff new to transfusion
  - Very experienced Emergency Nurse Practitioner
- 16:45 Transport waiting to take her home
- Febrile Non-Haemolytic Transfusion Reaction
  - Shaking & Rigors
  - Appeared agitated, but improved
  - Baseline T 36^{5o}c BP 155/80 mmHg P83 R 20
  - to T 38^{4o}C BP 165/71mmHg P 91 R 24

Case Study Two

- In 10min, T 39^{1o}C BP 153/58 mmHg P 82
- Further 15min, T39^{3o}C
- Treated with PO Chlorpheniramine 10mg
- Patient tired, keen to go home
- Daughter informed, will visit Mum later

- What would you do?

Case Study Two

- My view was send home
  - Daughter coming later
  - Sensible get some rest
  - Warm bed at home, trolley in the ED?
  - But I was not there
- Emergency Nurse Practitioner
  - Concerned about high temp
  - Elderly patient on her own.
  - Sent to ED
  - Emergency Consultant saw patient 20:00
  - Very angry, patient afebrile & wanted to go home

Case Study Three

- Friendly neighbourhood TP – bedside audit
- 33 yr old ♀, $^{1}/_{7}$ post intermediate risk gynae surgery
- 1 unit in Recovery, 2nd unit 16:00 next day
- Observed Excellent right patient right blood practice
- Patient's friend arrived
- TP waiting to observe 15min TPR
- Patient says
  - 'I can feel the blood go in'
  - 'I can feel it going through my body'
  - 'I am starting to feel strange'

Case Study Three

- TP thinks
  - ‘She can’t feel it going through her body’
  - ‘She is thinking about this too intently, we could have some psychosomatic symptoms’
  - ‘Great, come to an audit, patient will have serious reaction and I am meant to know what to do!’
  - ‘She can’t be having a reaction’
  - ‘She could be having a reaction!’
  - ‘Quietly and calmly take her pulse & resps’
  - P 66, R 16
  - ‘You must be very fit, feeling better??’

Conclusion

- Best cure for ATR: DON'T TRANSFUSE
- Can be very interesting to investigate
- Even mild reactions frightening for patients
- Generally basic practice has improved
- Next step, care of Transfusion Reactions
- New tools will bring in consistency
- New tools need to be promoted by <u>All of us</u>

- Thank you for listening