

ORBCoN Frozen Plasma Audit Results and Recommendations

ORBCoN Evening Symposium

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Background

- Audits of FP use show inappropriate transfusion when measured against guidelines (25 -75% inappropriate)
- Plasma guidelines themselves are not based on the best evidence
 - observational studies, expert opinion
- Plasma transfusion can have adverse effects: TACO, TRALI, allergic reactions



Background

- Cost savings can accrue from reducing inappropriate use
 - reduced costs of collecting, processing, distribution, administration
 - reduced costs of purchasing plasma by diversion of Canadian-sourced plasma to fractionators
 - reduced costs of managing complications, especially those that require ICU support



2008 FP Audit

- 155 hospitals invited to participate, 76 did
- Recorded all FP transfusions for any 5 days between Sept 22 and Oct 19, 2008
- 573 orders for 2012 units were audited
- Each order adjudicated independently by 2 hematologists according to pre-defined criteria from recently-published guidelines
- Also looked at variation between sites



Clinical Services Ordering Plasma

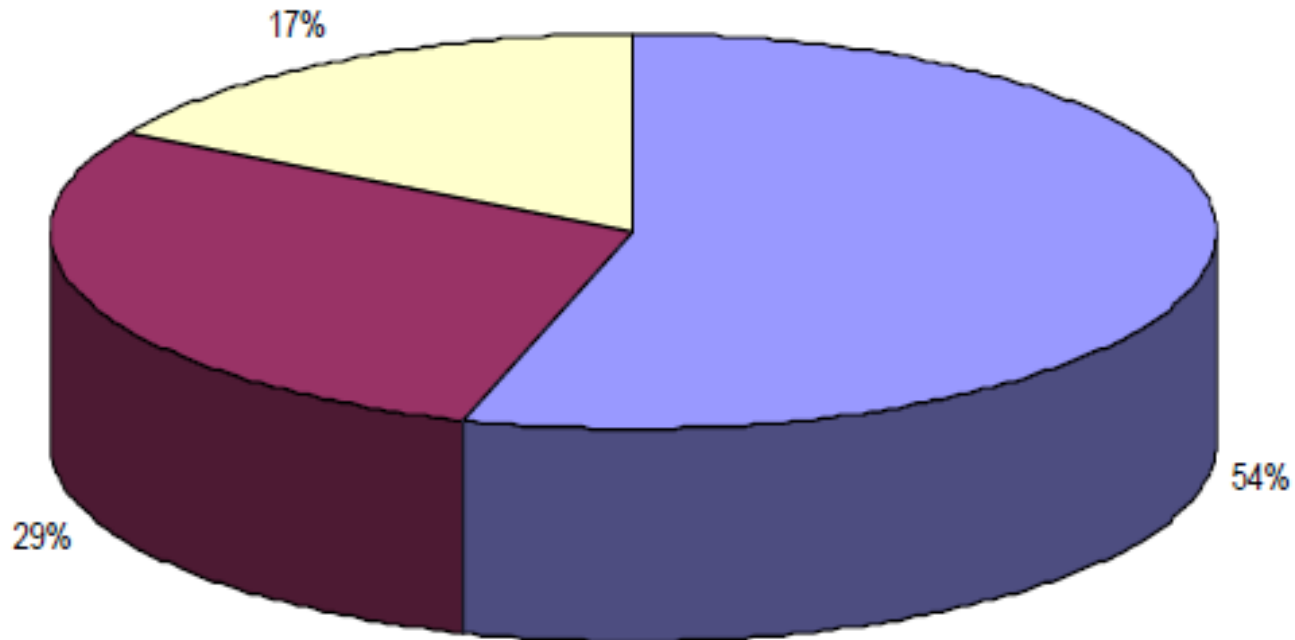
Specialty	Total # of orders (%)	Small (<100 beds)	Community (>100 beds)	Teaching (academic)
General Surgery	94 (16.4)	3 (13.6)	48 (17.3)	43 (15.8)
Internal Medicine	87 (15.2)	3 (13.6)	63 (22.7)	21 (7.7)
Emergency	72 (12.6)	4 (18.2)	48 (17.3)	20 (7.3)
Critical Care Medicine	48 (8.4)		19 (6.8)	29 (10.6)
Cardiovascular Surgery	42 (7.3)		4 (1.4)	38 (13.9)
Family Medicine	31 (5.4)	11 (50.0)	19 (6.8)	1 (0.4)

“Top three” in red



2008 FP Audit: Results

29% inappropriate



■ Appropriate requests ■ Inappropriate requests □ Indeterminate requests



2008 FP Audit: Appropriate

Appropriate Indications (total 314)	Number (%) of requests
Coagulopathy other than warfarin/Vit K deficiency Bleeding and INR >1.5 and/or PTT > 1x upper limit of normal (ULN)	96 (16.8)
Peri-surgical bleeding INR >1.5 and/or PTT > 1x ULN	80 (14.0)
Coagulopathy other than warfarin/Vit K deficiency Urgent intervention or surgery INR >1.5 and/or PTT > 1x ULN	43 (7.5)
Warfarin reversal or Vit K deficiency Bleeding INR >1.5 and/or PTT > 1x ULN	37 (6.4)
Massive transfusion INR >1.5 and/or PTT > 1x ULN	35 (6.1)

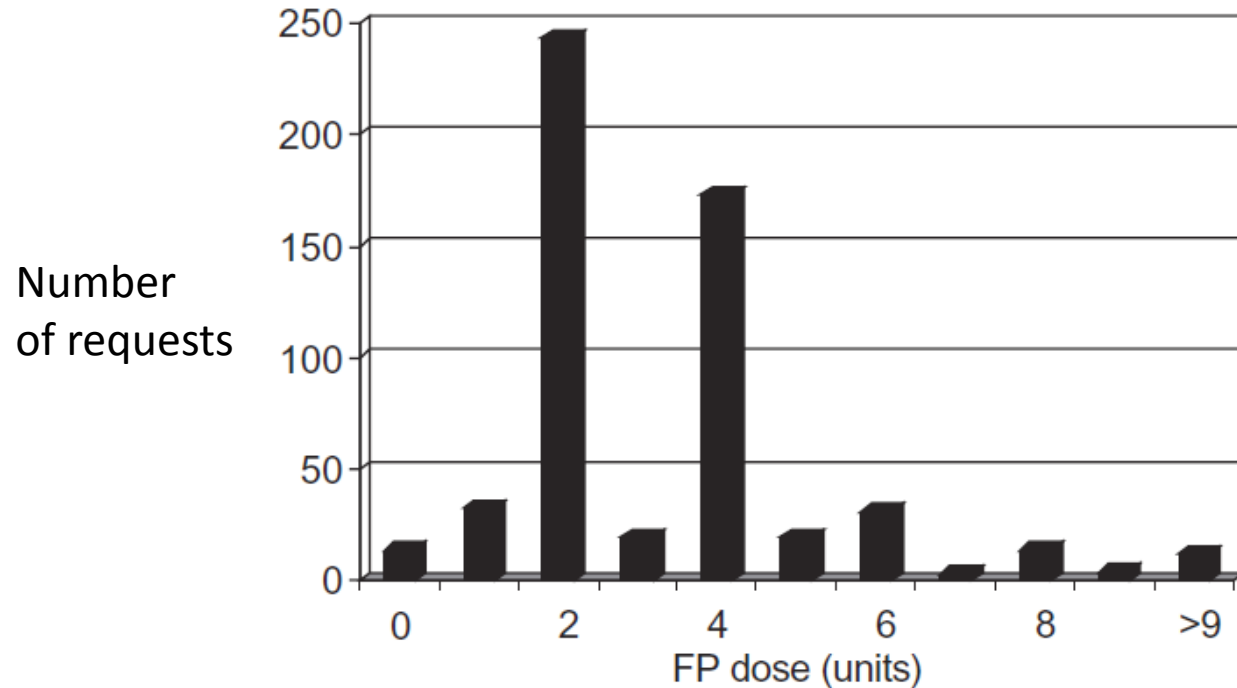


2008 FP Audit: Inappropriate

Inappropriate Indications (total 164)	Number (%) of requests
INR 1.1 - 1.5 and normal PTT Irrespective of bleeding or procedure status	97 (16.9)
Warfarin reversal or Vit K deficiency No bleeding	41 (7.2)
Reversal of other coagulation defect INR >1.5 and PTT >1 x upper limit of normal No bleeding or surgery or procedure planned	15 (2.6)
Heparin reversal (any INR/PTT)	10 (1.7)
INR \leq 1.0 and normal PTT Irrespective of bleeding or procedure status	7 (1.2)



Dose of Plasma Ordered



- 2 units of plasma = 7 mL/kg, insufficient to correct coagulopathy in adult
- Recommended dose is 10-15 mL/kg



2008 Audit: Recommendations

1. Introduction of clinical practice recommendations including strategies for implementation
2. A clear statement of indications for which FP should **not** be used (this statement was in the report)
3. A clear statement about dose required to improve hemostatic function and the risks of such a dosage
4. Advice on the use of Vitamin K alone for reversal of warfarin effect when time permits
5. Information on use of PCC for urgent warfarin reversal
6. Enhance awareness of the potential adverse effects of FP transfusion



What was done after the 2008 Audit?

- ORBCoN Transfusion Committee Toolkit March 2008, with FP Guidelines (actually before the audit)
- Publication in *CMAJ* 2010: “Rationalizing the clinical use of frozen plasma”
- Transfusion Committee Handbook (new name) August 2012, with FP and PCC Guidelines
- ORBCoN Resource Manual for Medical Directors (March 2013)
- Publication of 2008 audit results in *Transfusion* in October 2013 (A. Tinmouth)
- Results shared at hospital visits

Pinkerton. *CMAJ* 2010;182(10):1019.
Tinmouth. *Transfusion* 2013;53:2222



2013 FP Audit

- 158 hospitals invited to participate, 51 did
- Recorded all FP transfusions for any 5 days between Nov 18 and Dec 13, 2013
- 329 orders for 922 units were audited
- Each order adjudicated independently by 2 hematologists according to pre-defined criteria from recently-published guidelines
- PCC use was also audited this time



Clinical Services Ordering Plasma

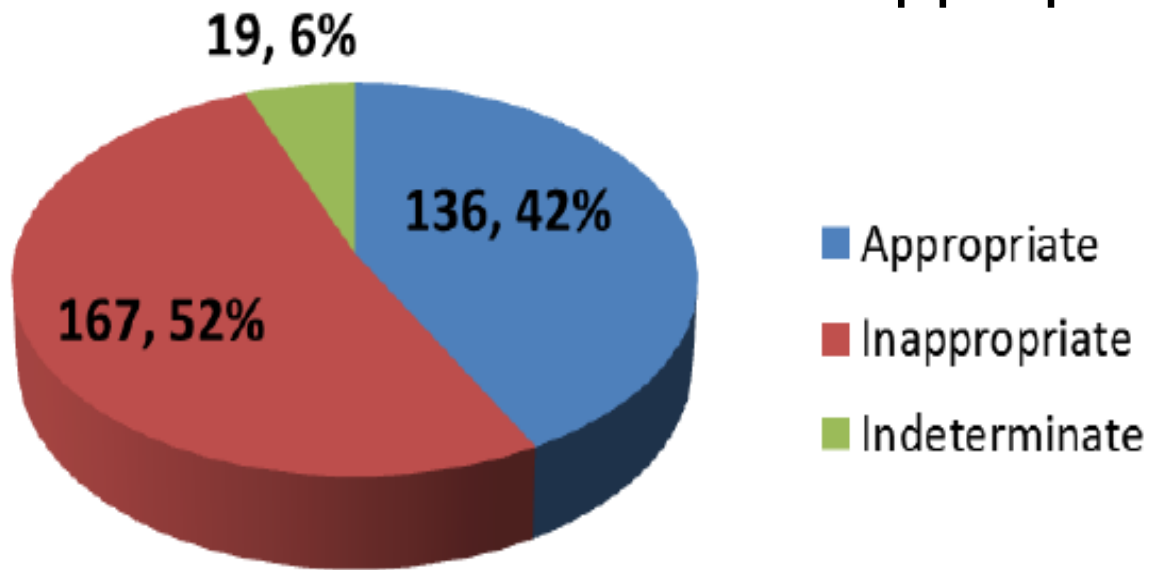
Specialty	Total # of orders (%)	Community (>100 beds)	Teaching (academic)
Critical Care Medicine	72 (22.4)	22 (11.6)	50 (37.6)
Internal Medicine	54 (16.8)	48 (25.4)	6 (4.5)
General Surgery	38 (11.8)	27 (14.3)	11 (8.3)
Anesthesia	26 (8.1)	10 (5.3)	16 (12.0)
Emergency	20 (6.2)	15 (7.9)	5 (3.8)
Cardiovascular Surgery	18 (5.6)	6 (3.2)	12 (9.0)

Only one Small Hospital (<100 beds) in 2013, data included with Community Hospital



2013 FP Audit

52% inappropriate



2013 FP Audit: Appropriate

Appropriate Indications (total 136)	Number (%) of requests
Coagulopathy other than warfarin, Vit K deficiency, heparin, other anticoagulant Bleeding INR >1.5 and/or PTT > 1.5 x upper limit of normal (ULN)	86 (26.1)
Massive transfusion INR >1.5 and/or PTT > 1.5 x ULN Or no coag test results available	29 (8.8)
Coagulopathy other than warfarin, Vit K deficiency, heparin, other anticoagulant Urgent surgery or invasive procedure INR >1.5 and/or PTT > 1.5 x ULN	20 (6.1)



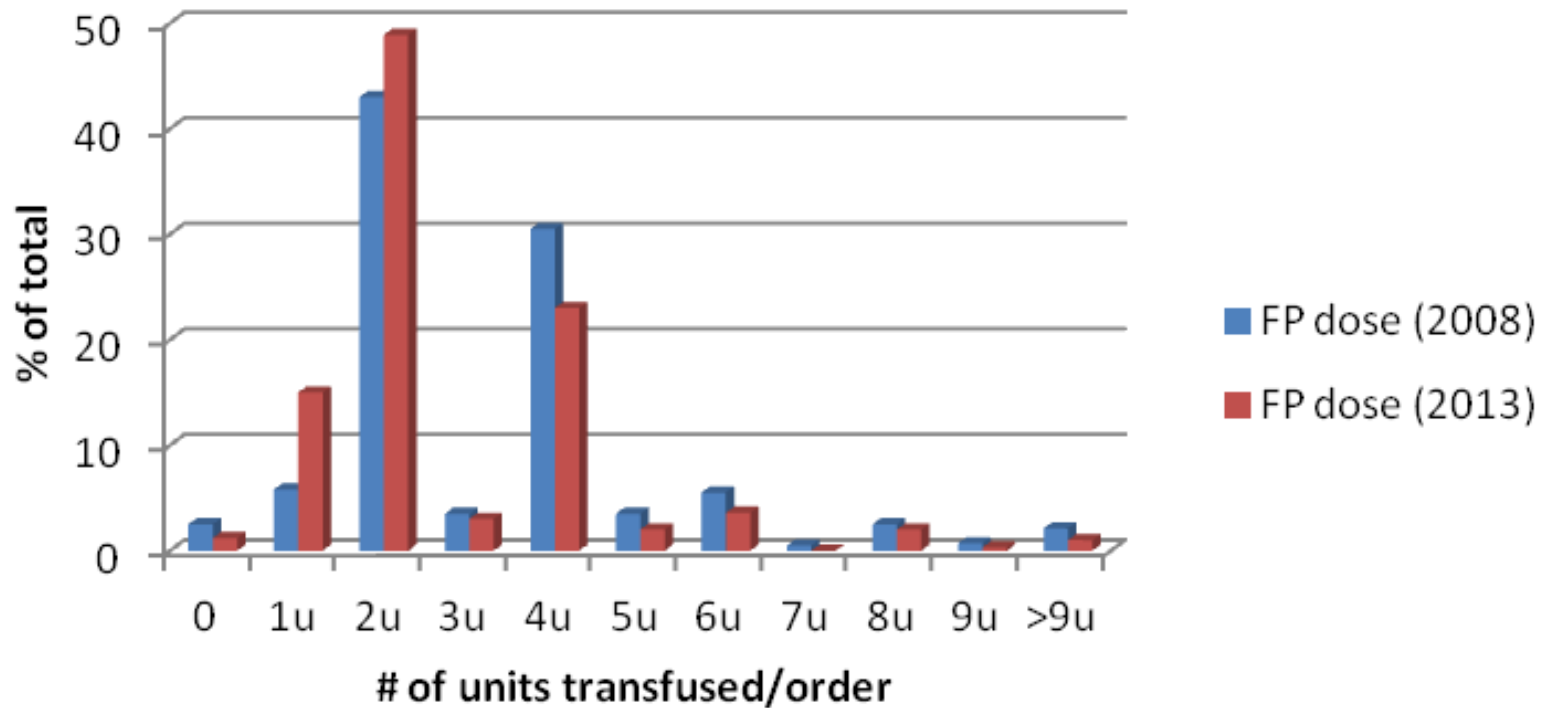
2013 FP Audit: Inappropriate

Inappropriate Indications (total 167)	# (%) of requests
INR \leq 1.5 and PTT \leq 1.5 x upper limit of normal (ULN) Irrespective of bleeding/procedure status	76 (23.1)
Warfarin reversal or Vit K deficiency Bleeding or pre-procedure but no contraindication to PCC	38 (11.6)
Reversal of coagulation defect other than warfarin or Vit K deficiency or heparin INR \geq 1.5 and/or PTT \geq 1.5 x ULN No bleeding or surgical procedure	21 (6.4)
Heparin reversal (any INR)	18 (5.5)



Dose of Plasma Ordered: 2008 and 2013

Distribution of FP dose transfused 2008 vs 2013 audit
(% of total transfusions)



2008 vs. 2013 FP Audits

	2008	2013
% of provincial FP issues represented in audit	88	60
% appropriate requests	54.8	42
% inappropriate requests	28.6	52
Most popular dose in units (%)	2 (42.4)	2 (49)
Second most popular dose (%)	4 (30)	4 (23.5)
% indication and dose appropriate	29	19.7
More appropriate requests if guidelines are in place?	yes	no



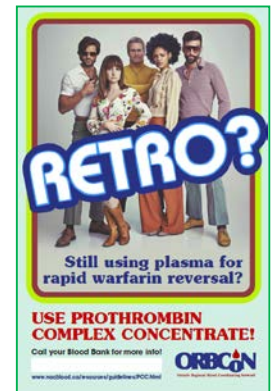
2013 Audit: Recommendations

- √ 1. Develop formal clinical practice recommendations for adoption by all hospitals
- √ 2. Develop a quality improvement plan for FP transfusion
- √ 3. Develop a standardised template order form for FP
4. Require all hospitals to perform annual FP audits with standardised metrics
5. Results of annual audits to be reported to a provincial body and results distributed for peer comparison
6. Develop an algorithm for technologist screening of FP orders, specifically for warfarin reversal by transfusion
7. Develop educational resources that target the largest FP users and those with the highest inappropriate use, for use by local TM physicians



What was done after the 2013 Audit?

- Choosing Wisely and Choosing Wisely Canada statements created and widely promoted/disseminated
- ORBCoN Transfusion Committee Handbook revised April 8, 2016, with FP and PCC Guidelines
- Ontario Transfusion Quality Improvement Plan (OTQIP) launched 2016, focus is on red cells but includes FP recommendations for adult inpatients and Order Set
- “Retro” posters for hospitals from ORBCoN
- Variation in hospital practice published in 2018
- Results shared at hospital visits



Choosing Wisely



An initiative of the ABIM Foundation



Five Things Physicians and Patients Should Question

3

Don't routinely use blood products to reverse warfarin.

Patients requiring reversal of warfarin can often be reversed with vitamin K alone. Prothrombin complex concentrates or plasma should only be used for patients with serious bleeding or requiring emergency surgery.

Callum. Transfusion 2014;54:2344.



Choosing Wisely Canada



Don't routinely transfuse fresh frozen plasma, vitamin K, or platelets to reverse abnormal tests of coagulation in patients with cirrhosis prior to abdominal paracentesis, endoscopic variceal band ligation, or any other minor invasive procedures.



Choosing Wisely Canada



- 3** Don't transfuse plasma to correct a mildly elevated (<1.8) international normalized ratio (INR) or activated partial thromboplastin time (aPTT) before a procedure.

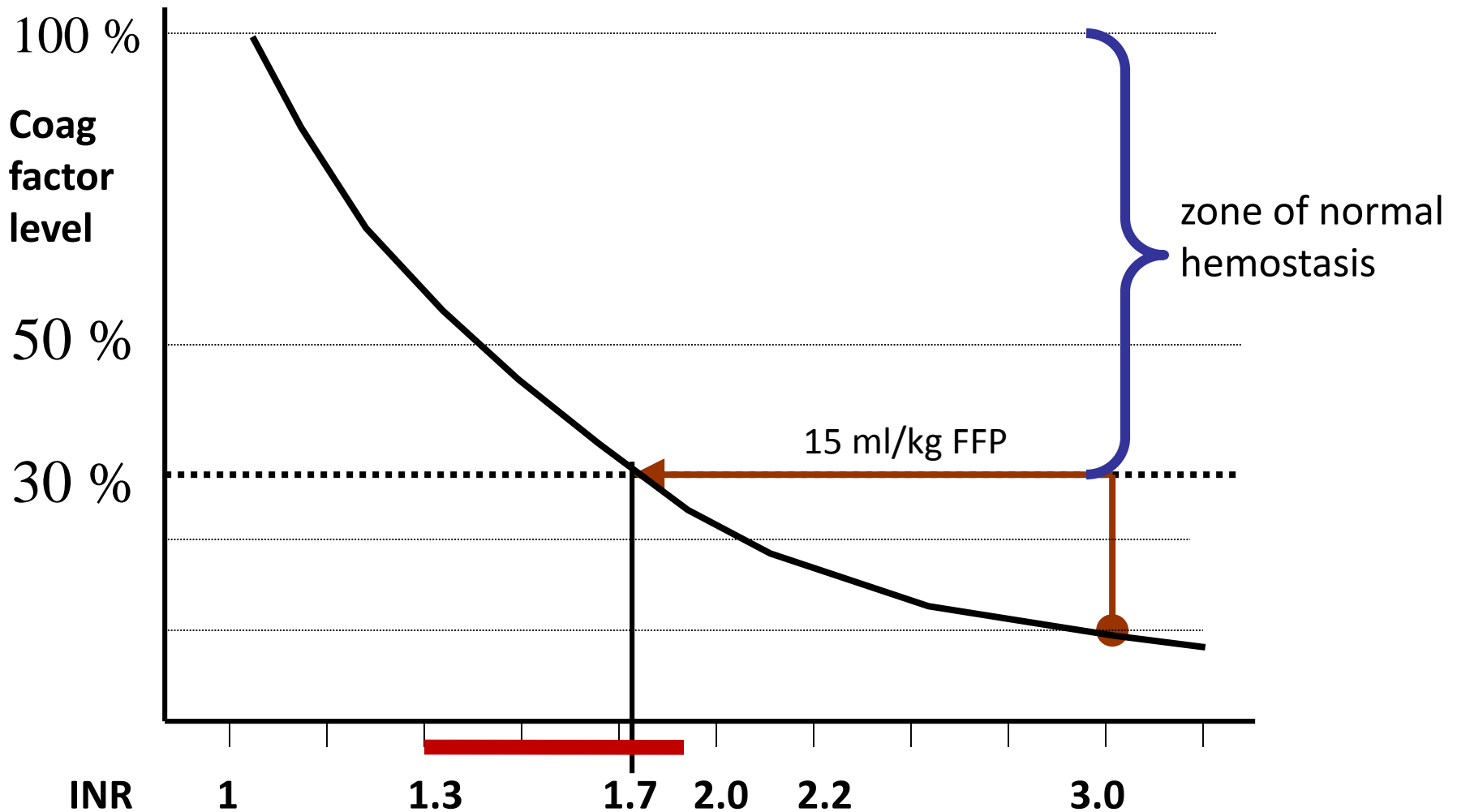
Why does the CSTM say this?

Where does the INR limit of < 1.8 come from?

<https://choosingwiselycanada.org> 2014



INR and Coagulation Factor Levels



Recommendations and Order Set



Inspiring and facilitating best transfusion practices in Ontario.

BLOODY EASY E-TOOLS & PUBLICATIONS

TOOLKITS

IVIG/SCIG

BLOOD UTILIZATION

TM GUIDELINES, STANDARDS & RECOMMENDATIONS

FOR PATIENTS

ORBCON RESOURCES

QUALITY IMPROVEMENT

What are you looking for:

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Quality Improvement Plan

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QUALITY IMPROVEMENT PLAN

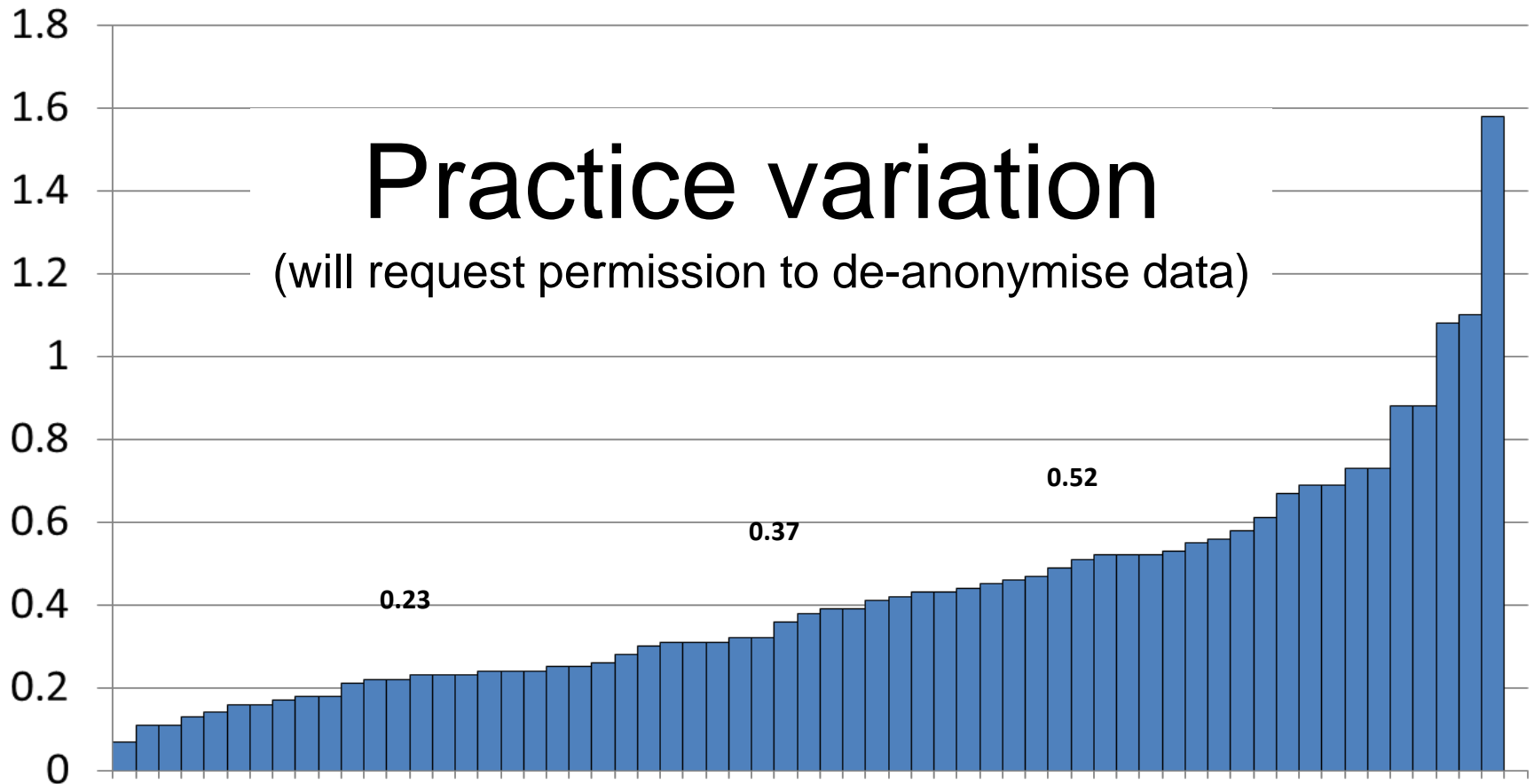
QIP introduced in 2016



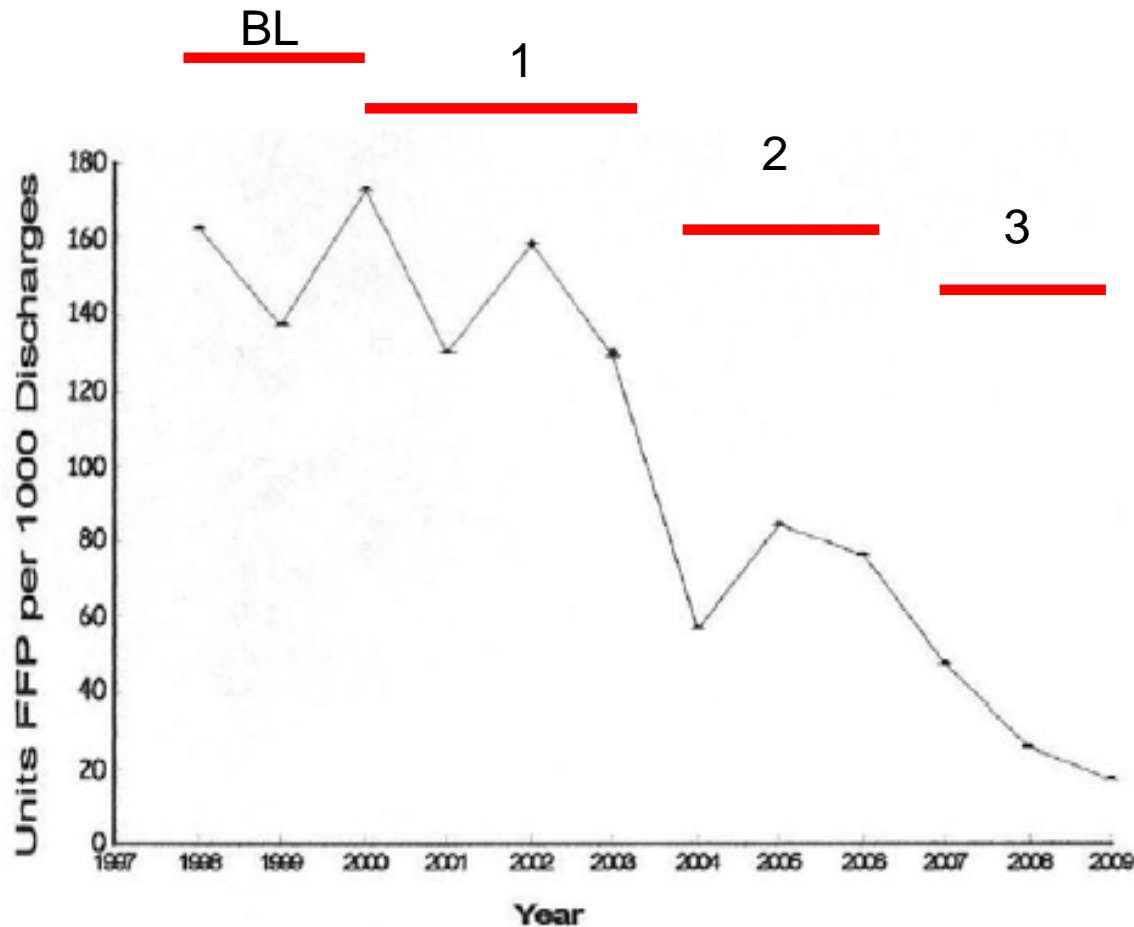
Ontario Transfusion Quality Improvement Plan
Guidance Document for Institutional
Implementation



Plasma Consumption per 100 Active Inpatient Treatment Days, Ontario Community Hospitals with more than 50 beds, Fiscal Year 2016-2017



Interventions and Plasma Use



Interventions

1. Education (INR < 2 or < 1.5 for LP)
2. BB technologist screen
3. Med Director approval

Results

- ↓ plasma use by 90% from baseline (BL)
- patient acuity ↑ in this period
- Hospital mortality rates ↓



Questions?



Please consider donating blood or bone marrow

www.blood.ca

beadonor.ca



Please consider registering as an organ donor

www.beadonor.ca

