13° CONGRESO COLOMBIANO &
19° CONGRESO IBEROAMERICANO DE
BANCOS DE SANGRE, MEDICINA
TRANSFUSIONAL Y TERAPIA CELULAR
CONECTADOS CON EL PACIENTE
Octubre 31 a Noviembre 3 del 2024
Bogotá Colombia, Hotel Sheraton

Hemovigilancia en Tiempo Real

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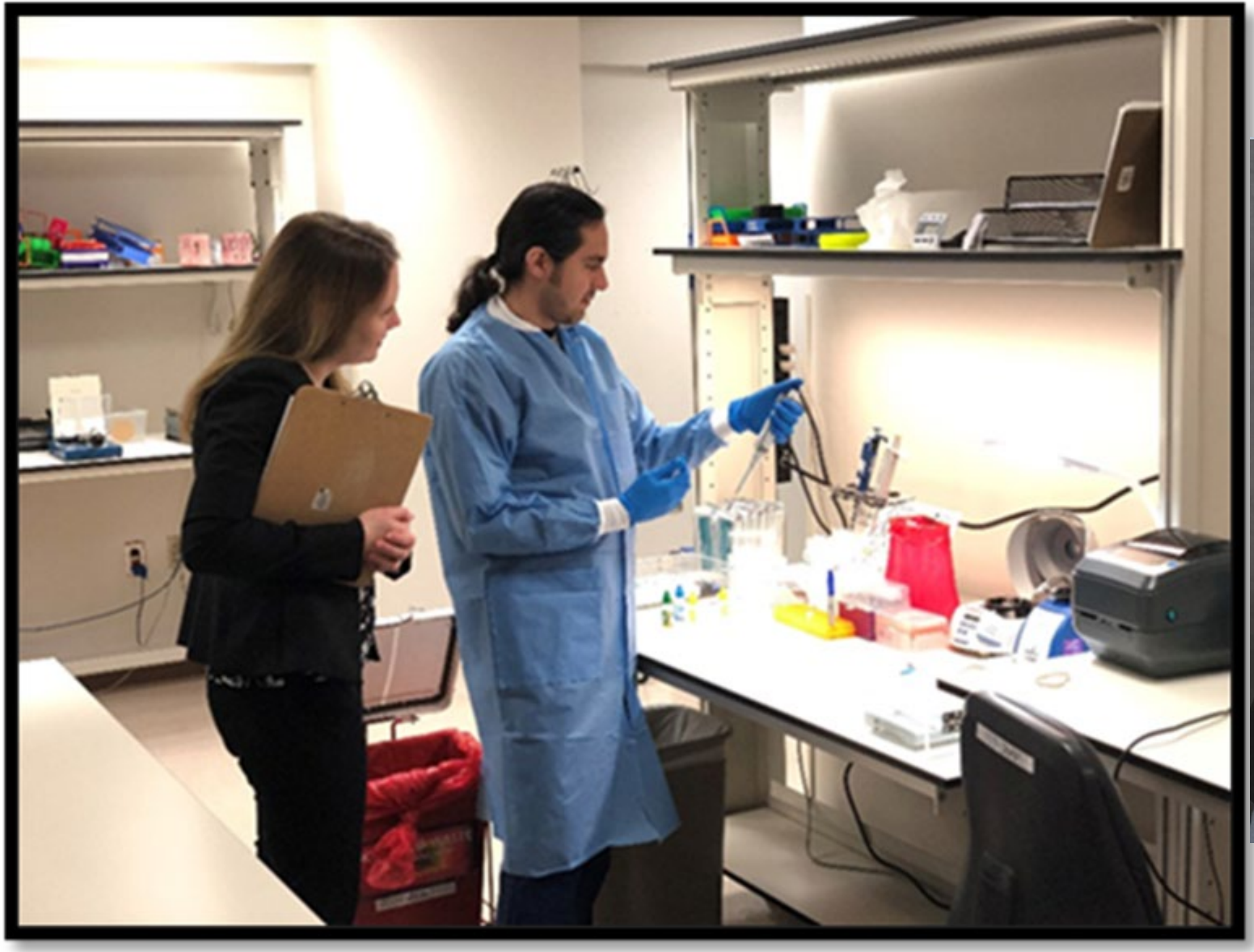
THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center

Acobasmet
Asociación Colombiana de Bancos de Sangre y Medicina Transfusional

Conflicto de intereses

No hay conflicto de intereses que declarar



Objetivos

- **Descripción de los riesgos de transfusión**
- **Perspectiva histórica de la hemovigilancia y revisión de la literatura**
- **Desarrollo de un sistema de hemovigilancia (HVU) en tiempo real en un hospital oncológico y la experiencia de 5 años**

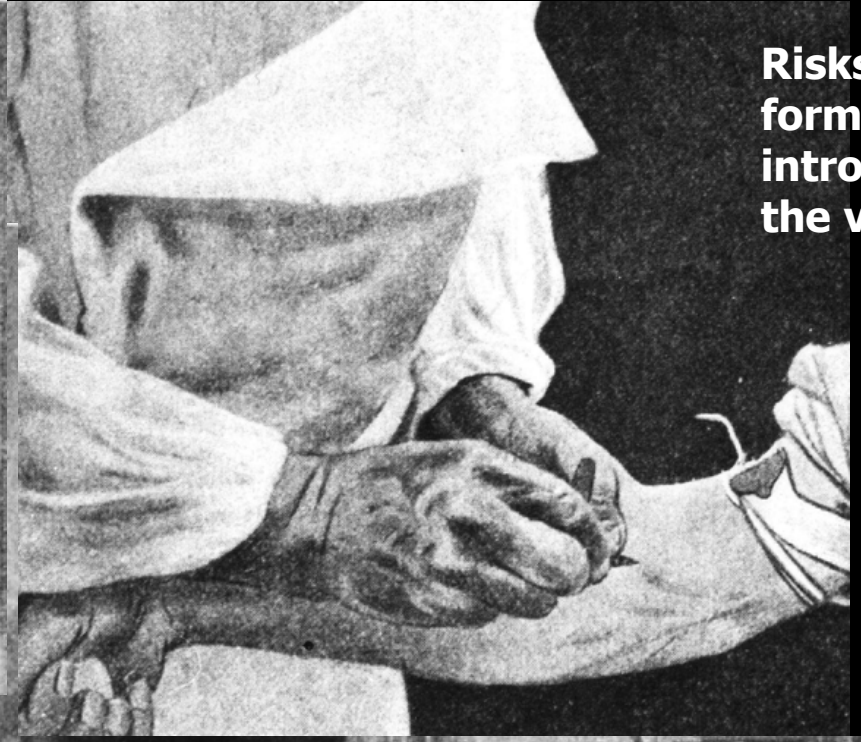
Riesgos de transfusion

Transfusion es el procedimiento más frecuentemente realizado en los hospitales de los Estados Unidos

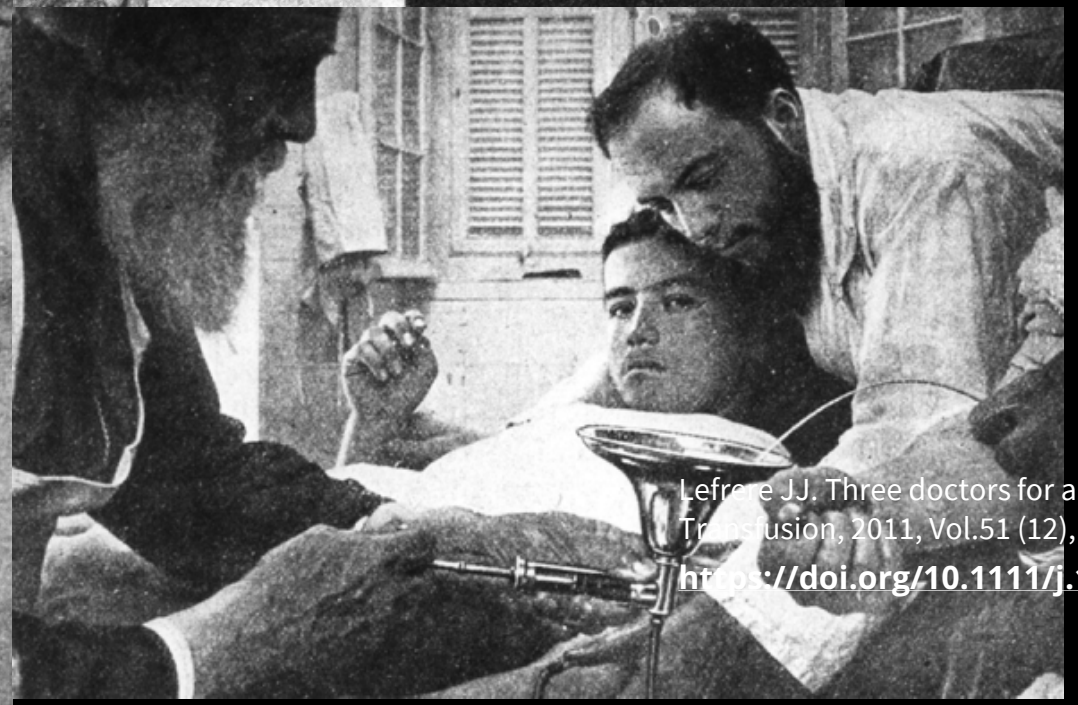
Sin embargo, hay ciertos riesgos y eventos adversos asociados con transfusión

Anne Pfuntner, Lauren M Wier, MPH, and Carol Stocks, RN, MHSA. Most Frequent Procedures Performed in U.S. Hospitals, 2010. Statistical Brief #149. Published: February 2013.

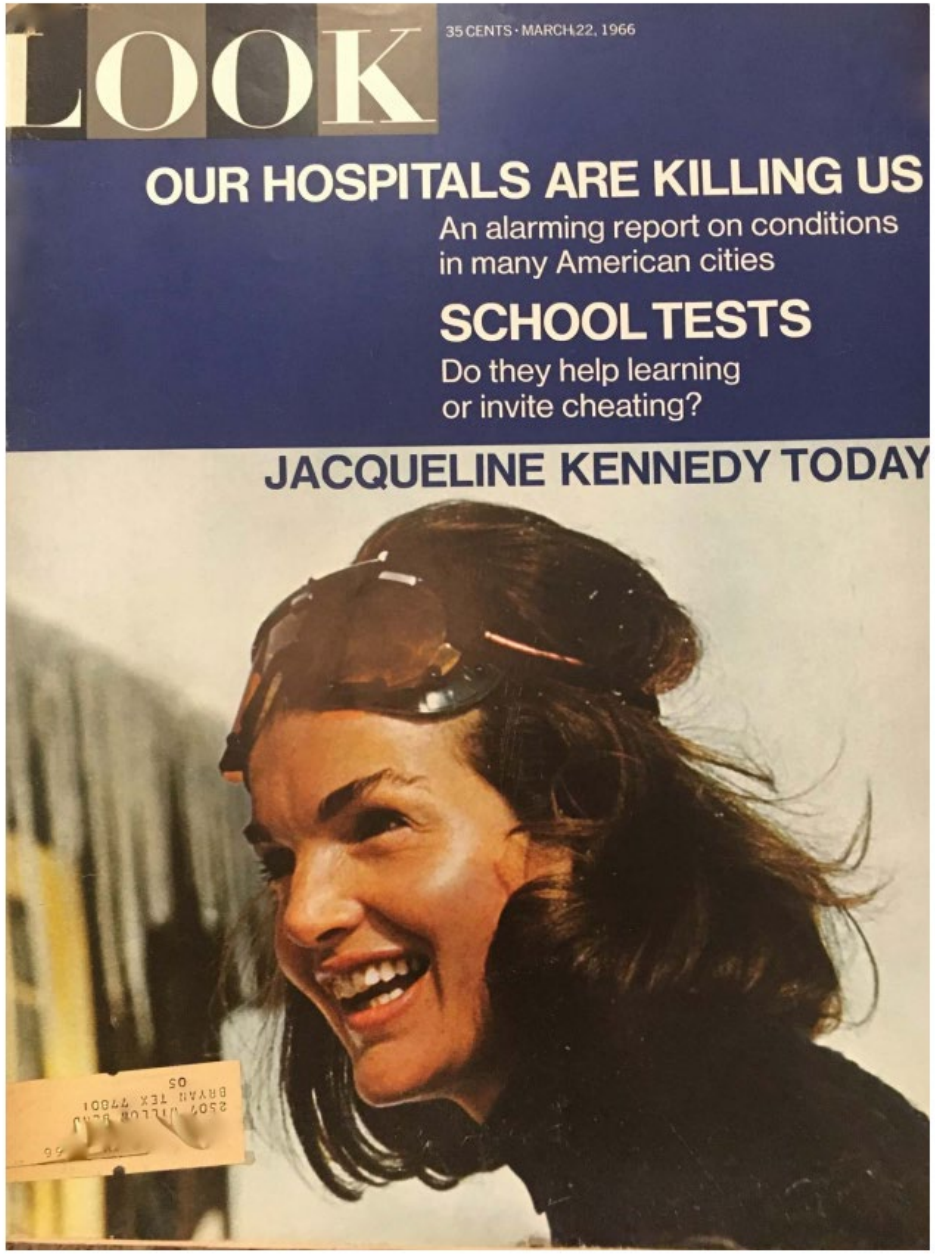
https://www.ncbi.nlm.nih.gov/books/NBK174682/



Risks feared at the time: formation of a clot and introduction of an air bubble in the vein



Lefrere JJ. Three doctors for a transfusion during World War I
Transfusion, 2011, Vol.51 (12), p.2534-2535
http://doi.org/10.1111/j.1537-2995.2011.03127.x



contamination

After 16 patients died during an epidemic, a San Francisco hospital discovered the cause: a new hospital-born strain of Staphylococcus aureus.

cal," the Pennsylvania doctors confirm.

The ease of administration and the miraculous absence of pain involved in anesthesia belie its serious depressant effects on the human body, even when negligence is not involved. A healthy six-year-old child scheduled for a corrective eye operation was placed under general anesthesia, then lapsed into cardiac arrest. The anesthetist refilled the bag with oxygen and attempted to restore the heart action by external massage, without success. A surgeon preparing for surgery was rushed in and opened the child's chest. Massaging the exposed heart by hand started it pumping again, but too late to save the blood-starved brain. The child became a blind mute, spastic quadriplegic and was confined to a state hospital. The brain cells can exist only four minutes without oxygen-blood nourishment, after which damage is permanent.

Even a slight cold or feverishness, especially in a small child, may trigger tragic results in otherwise routine surgery. A young child of 20 months, undergoing a harelip correction, initially, had his surgery delayed because of a cold. When it was rescheduled, his temperature was only slightly elevated, but he was taken into surgery and put "asleep" by the nurse-anesthetist. What should have been a routine repair became a biological debacle as the child's temperature soared, destroying brain tissue irreparably.

Another too-frequent cause of anesthesia death is the aspiration of vomit from the stomach into the lungs during an operation, especially during maternity cases in which the mother may have eaten before delivery. Dr. Daniel C. Weaver of Yale explains that "many physicians" are either "largely unaware" of the danger or are ignorant about the prevention of such tragedies.

The reason for uneasiness about anesthesia death is that it is usually preventable, and most often caused by anesthetist error or oversight. Once considered a technician's job, anesthesia has now so grown in complexity that many medical critics believe only the ablest, most intensively trained physician can properly handle the unanticipated anesthesia emergency. Unfortunately, 57 percent of hospital anesthesia is administered by nondoctors: nurse-anesthetists and technicians.

The necessity of skill is illustrated by a recent tragedy in Kansas. A patient with a mastoid condition consulted a surgeon, who ordered an operation. The head anesthesiologist at the hospital had a resident in training aid him, and the young doctor administered the anesthesia, then inserted an endotracheal tube into the patient to carry oxygen to his lungs during the operation. But instead of inserting it in his windpipe, the resident placed the oxygen carrier in the patient's esophagus, leading to the stomach. The error resulted in a bluish cyanotic condition, caused by the lack of oxygen. The result of the young anesthetist's failure of skill was a cripple—a patient unable to see, talk, walk or perform his bodily functions.

The electronic monitors in the modern operating room are valuable additions to medicine, but overreliance on the blips and waves by the anesthetist to the point of not perceiving the symptoms displayed by the flesh-and-blood patient may invite disaster. Dr. Valentino D. B. Mazzia, professor of anesthesiology at New York University School of Medicine, after examining 21 anesthesia deaths, concluded that the electrocardioscope monitor "did not help to predict the chain of events early enough to reverse them," and that it "was of no value in avoiding a lethal overdose of anesthetic agent."

The patient can avoid some of the most glaring shortcomings in anesthesiology by insisting on skilled hands putting him "to sleep." A board-certified anesthesiologist is preferable, a nonboard physician-anesthetist next and the nurse-anesthetist in an emergency only.

Two and a half million hospital patients receive transfused whole blood yearly, and most live to discuss it. But the toll of blood-transfusion accidents and biological contamination is outlandishly high: A minimum of 3,000 die every year, and from 10,000 to 75,000 hospitalized patients contract hepatitis as a result of the transfusion. Thousands more suffer other serious reactions, including hemorrhaging, gangrene, red-cell destruction, kidney disease and even heart attacks.

Dr. Leon Sussman, blood specialist at Beth Israel Hospital in downtown Manhattan, is convinced that preventable "human failure" in the hospital accounts for at least 50 percent of blood-transfusion accidents. The tales of such negligence fill the malpractice courts. In California, a six-week-old child was hospitalized for a skull fracture. Tests revealed internal bleeding, and a blood transfusion was ordered. The child's blood was Type A, Rh-negative, but it was mistyped, and the child was given Type A, Rh-positive instead. When the transfusion was completed, the child's left foot, where the blood was inserted, started to turn blue. Later, without correction of the error, the same blood, from the same bottle, was given to the child in still another transfusion. Both legs turned heavily cyanotic, then gangrenous, and had to be amputated below the knee.

Keeping incompatible foreign blood out of the human body is essential. Almost immediately after incompatible blood has begun to flow out of the plastic bag into the patient's veins, he complains first of backache, then of chest pain.

With only an ounce or two of donor's mismatched blood in him, the peripheries of his body start to turn blue, and he becomes restless. Inside his body, the donor's red-blood cells are being destroyed at a critical cost to the body.

"If the transfusion is interrupted at this point, there are seldom any serious aftereffects," Dr. Sussman states in *Trauma*, a medical-legal journal. "However, if continued, the reaction gets worse, with chills and fever and severe prostration. (If the patient is under the effect of a general anesthetic, these symptoms may not be recognized.) The symptoms progress rapidly, and soon pulmonary edema (filling of the lungs with fluid and blood) may appear, followed rapidly by death."

Cross matching samples of the patient's and donor's blood, a process that should be reflex in the good hospital, is the vital safeguard. The red cells of the donor are mixed with the serum (liquid) of the patient's blood and vice versa. The mixtures are watched carefully for telltale signs of clotting, a warning that the transfusion will be a threat to the patient's life.

Despite the existence of this check, the range of transfusion mistakes in the hospital is staggering. Bottles of blood are mislabeled; donors are not correctly identified; units of blood are delivered to the wrong patients (a special danger when two patients in a hospital have the same name); blood is mismatched; bottles crack and become contaminated; the patient is improperly identified; a sample of his blood is typed, then placed under someone else's name.

The most frustrating aspect of blood death is that many of the transfusions given in American hospitals appear to be unnecessary. Of 30 incompatible blood transfusions studied by Dr. Lee Binder and colleagues at the Kings County Hospital in Brooklyn, 16 were judged to have been unnecessary, and ironically, more lethal. "Clearly, the morbidity from blood-transfusion reactions would have been reduced by more than half and the mortality almost to zero were there greater appreciation for the indications for the use of blood," the doctors state in *Surgery, Gynecology & Obstetrics*.

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https://www.leanblog.org/2017/09/hospitals-killing-us-1966-magazine/

Las peligrosas deficiencias citadas en el artículo d "Look"

- Errores de medicación
- Incompetencia en anestesia
- Infección nosocomial
- Deficiencias en el trabajo diagnostico
- Errores de transfusión
- Cirugía innecesaria
- Negligencia

https://www.leanblog.org/2017/09/hospitals-killing-us-1966-magazine (lean blog by Mark Graban)

Riesgos de transfusion

But when asked, a nurse was asked to recall any medication errors she had ever made and "answered confidently:"

> "None – to my knowledge, I have never made one."

It's often said that anesthesia and blood transfusions have become MUCH safer over the past 50 years. That's not because of better people, it's better process, error proofing, and technology that have led to better care in those areas, which are held up as positive examples of some parts of healthcare "getting it" and making significant improvements.

https://www.leanblog.org/2017/09/hospitals-killing-us-1966-magazine (lean blog by Mark Graban)

Riesgos de Transfusion

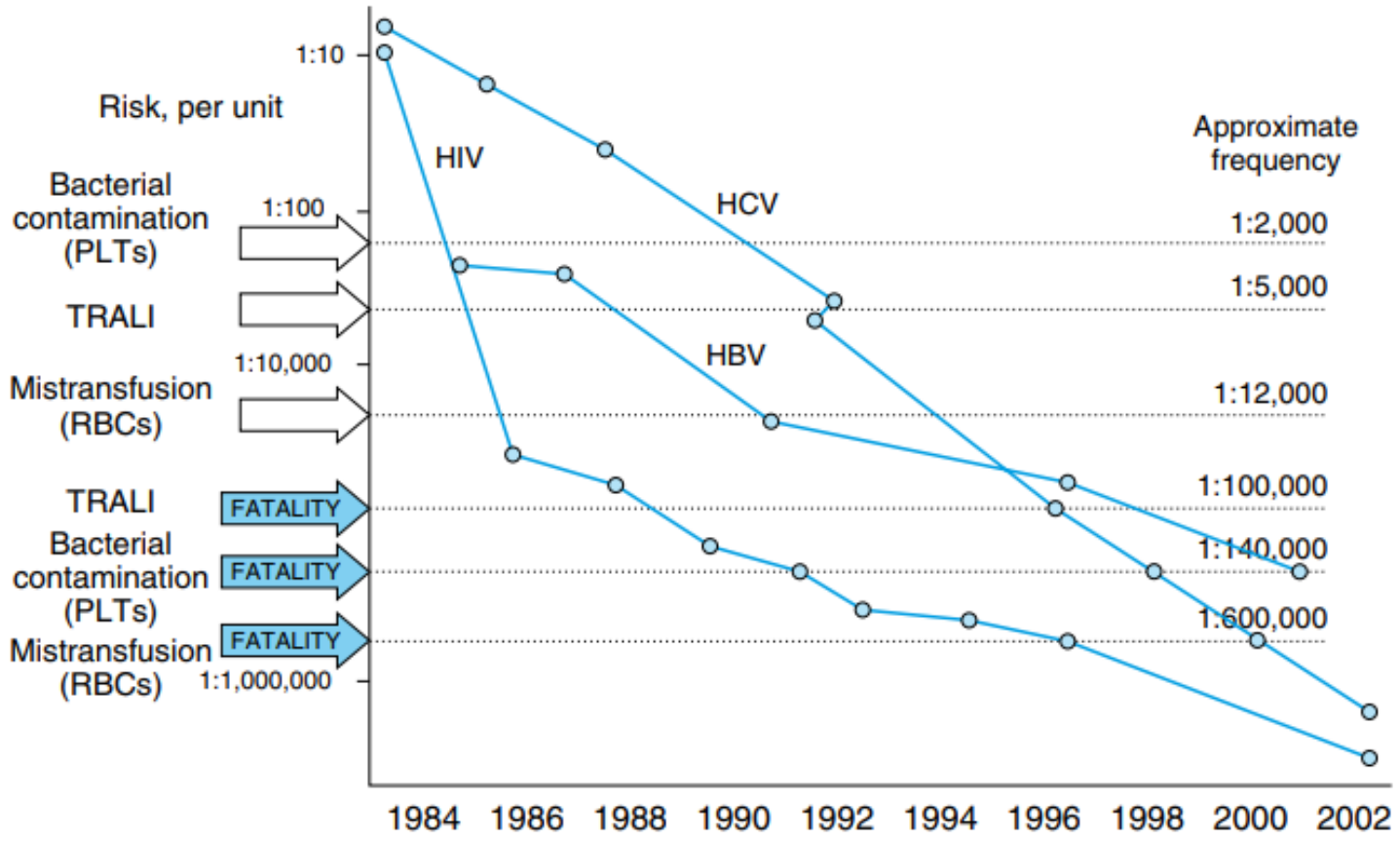

FIGURE 66.1 Comparison of transfusion risks and their evolution over time. HBV hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus; PLTs, platelets; RBCs, red blood cells; TRALI = transfusion related acute lung injury; From AuBuchon JP. (2004). Emily Cooley Memorial Award. Managing change to improve transfusion safety. *Transfusion* **44**, 1377–1383.

Riesgos de transfusion

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- **Agencias reguladoras para asegurar la Seguridad de los Componentes sanguíneos**
  - **CDC: Agencia Federal de USA a cargo de la seguridad de los componentes sanguíneos (donante a paciente)** https://www.cdc.gov/bloodsafety/basics.html#print
  - **INAS: Instituto Nacional de Salud (donante a paciente)** https://www.ins.gov.co/BibliotecaDigital/manual-de-hemovigilancia-2023.pdf

Perspectiva Historica

- **Hemovigilancia**
  - **Haema=Sangre**
  - **Vigilans=Vigilar**
- **Es un sistema que captura eventos adversos relacionados con donación y transfusión de componentes sanguíneos con la intención de prevenir y mitigar riesgos y dentro de lo posible evitar futuros eventos adversos**

R R P de Vries 1, J-C Faber, P F W Strengers, Board of the International Haemovigilance Network. Haemovigilance: an effective tool for improving transfusion practice. Vox Sang. 2011 Jan;100(1):60-7. doi: 10.1111/j.1423-0410.2010.01442.x.

Perspectiva Histórica

- Sistema Japones de Hemovigilancia (1993)
- Sistema Frances de hemovigilancia (1994)
- Alemannia (1994) Grecia (1995)
- SHOT (Serious Hazards of Transfusion) 1996
- Colombia (2002 desarrollo del proyecto Epi-Blood de OPS/OMS)
- Estados Unidos (National Healthcare Safety Network (NHSN) Biovigilance Component Hemovigilance) 2010
- Diferencias Metodológicas (rata de reacciones de 0.22%)

Perspectiva Historica

- **El reporte de reacciones transfusionales es pasivo**
- **Gran discrepancia entre el número de eventos adversos reportados vs los casos identificados por vigilancia activa**
- **La vigilancia activa da un paso adelante en hemovigilancia pero en la mayoría de los casos es realizada después del evento**

Perspectiva Histórica

Table 3: Transfusion-Associated Fatalities by Complication, FY2017 – FY2021

Complication	FY17 No.	FY17 %	FY18 No.	FY18 %	FY19 No.	FY19 %	FY20 No.	FY20 %	FY21 No.	FY21 %	Total No.	Total %
Anaphylaxis	3	8%	2	6%	2	5%	6	21%	4	10%	**17**	**9%**
Contamination	7	19%	7	23%	1	2%	4	14%	5	12%	**24**	**13%**
HTR (ABO)	1	3%	2	6%	4	9%	2	7%	5	12%	**14**	**7%**
HTR (Non-ABO)	6	16%	4	13%	11	25%	2	7%	2	5%	**25**	**14%**
TACO	11	30%	12	39%	12	27%	8	27%	15	36%	**58**	**32%**
TRALI*	9	24%	4	13%	12	27%	6	21%	7	16%	**38**	**21%**
Transfusion Reaction, Type Not Determined	0	0%	0	0%	2	5%	1	3%	3	7%	**6**	**3%**
Other	0	0%	0	0%	0	0%	0	0%	1	2%	**1**	**1%**
Total	37		31		44		29		42		**183**	

Note: FY2017-FY2021 only includes cases with an imputability of *definite, probable*, or *possible*

*FY2017-FY2021 numbers combine both *TRALI* and *Possible TRALI* cases

https://www.fda.gov/media/172382/download?attachment

Perspectiva Histórica

TABLE 1 Community setting, facility size, number of transfusion service staff, employment of a quality assurance staff member to investigate transfusion-related adverse reactions, and transfusion service provider for health care facilities reporting to the NHSN Hemovigilance Module, 2010 to 2018[a]

	Number of facilities (%)			
Health care facility characteristics	**2010–2012**	**2013–2016**	**2017–2018**	**2013–2018**
Total facilities included in study	77 (100.0%)	182 (100.0%)	148 (100.0%)	201 (100.0%)
Community setting of health care facility				
Urban	52 (67.5%)	89 (48.9%)	71 (48.0%)	103 (51.2%)
Suburban	18 (23.4%)	66 (36.3%)	57 (38.5%)	68 (33.8%)
Rural	4 (5.2%)	27 (14.8%)	20 (13.5%)	30 (14.9%)
Number of health care facility beds served by the transfusion service				
≤249	15 (19.5%)	83 (45.6%)	75 (50.7%)	90 (44.8%)
250–499	36 (46.8%)	59 (32.4%)	44 (29.7%)	67 (33.3%)
500–749	17 (22.1%)	22 (12.1%)	10 (6.8%)	23 (11.4%)
≥750	9 (11.7%)	18 (9.9%)	19 (12.8%)	21 (10.4%)
Number of transfusion service staff members[b]				
Less than 5	11 (14.3%)	44 (24.2%)	40 (27.0%)	50 (24.9%)
5 or more and less than 10	20 (26.0%)	51 (28.0%)	51 (34.5%)	60 (29.9%)
10 or more and less than 20	27 (35.1%)	40 (22.0%)	26 (17.6%)	51 (25.4%)
20 or more	19 (24.7%)	43 (23.6%)	28 (18.9%)	36 (17.9%)
Health care facility employs a full-time quality assurance staff member				
Yes	36 (46.8%)	64 (35.2%)	55 (37.2%)	72 (35.8%)
No	41 (53.2%)	118 (64.8%)	93 (62.8%)	129 (64.2%)
Health care facility's transfusion service provided by				
Health care facility	42 (54.5%)	111 (61.0%)	95 (64.2%)	121 (60.2%)
Separate health care facility	12 (15.6%)	11 (6.0%)	6 (4.1%)	15 (7.5%)
Blood collection center or centralized transfusion service	14 (18.2%)	60 (33.0%)	47 (31.8%)	65 (32.3%)

Ian Kracalik, Sanjida Mowla, Sridhar V. Basavaraju, Mathew R.P. Sapiano. Transfusion-related adverse reactions: Data from the National Healthcare Safety Network Hemovigilance Module — United States, 2013–2018. Transfusion, 2021, Volume 61, Issue 5, Pages 1424-1434.

Perspectiva Histórica

TABLE 2 Number of blood components transfused by component type, collection method, irradiation, leukoreduction, as reported to the NHSN HV Module, 2013 to 2018[a]

Blood component	2013–2014	2015–2016	2017–2018	2013–2018
All components	2,586,574	3,268,327	2,486,373	8,341,274
RBC[b]	1,445,518 (55.9%)	1,742,311 (53.3%)	1,441,615 (58.0%)	4,629,444 (55.5%)
Apheresis[c]	153,483 (10.6%)	216,730 (12.4%)	201,257 (14.0%)	571,470 (12.3%)
Whole Blood Derived[c d]	1,292,035 (89.4%)	1,525,581 (87.6%)	1,240,358 (86.0%)	4,057,974 (87.7%)
Irradiated[c e]	436,942 (30.2%)	597,441 (34.3%)	533,930 (37.0%)	1,568,313 (33.9%)
Leukoreduced[c e]	1,368,387 (94.7%)	1,661,357 (95.4%)	1,410,117 (97.8%)	4,439,861 (95.9%)
PLT[b]	476,852 (18.4%)	691,313 (21.2%)	449,829 (18.1%)	1,617,994 (19.4%)
Apheresis[c]	342,029 (71.7%)	448,301 (64.8%)	397,490 (88.4%)	1,187,820 (73.4%)
Whole Blood Derived[c d]	134,823 (28.3%)	243,012 (35.2%)	52,339 (11.6%)	430,174 (26.6%)
Irradiated[c e]	365,334 (76.6%)	569,158 (82.3%)	370,879 (82.4%)	1,305,371 (80.7%)
Leukoreduced[c e]	451,675 (94.7%)	673,676 (97.4%)	447,871 (99.6%)	1,573,222 (97.2%)
Pathogen reduced[c]	0 (0.0%)	3328 (0.5%)	36,205 (8.0%)	39,533 (2.4%)
Plasma[b]	434,537 (16.8%)	481,060 (14.7%)	333,625 (13.4%)	1,249,222 (15.0%)
Apheresis[c]	38,997 (9.0%)	58,017 (12.1%)	49,931 (15.0%)	146,945 (11.8%)
Whole Blood Derived[c d]	395,540 (91.0%)	423,043 (87.9%)	283,694 (85.0%)	1,102,277 (88.2%)
Pathogen reduced[c]	0 (0.0%)	356 (0.1%)	598 (0.2%)	954 (0.1%)
Cryoprecipitated AHF[b]	216,289 (8.4%)	343,447 (10.5%)	249,949 (10.1%)	809,685 (9.7%)
Whole Blood[b]	13,378 (0.5%)	10,196 (0.3%)	11,355 (0.5%)	34,929 (0.4%)

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Perspectiva Histórica

TABLE 3 Transfusion-associated adverse reactions by severity designation reported to the NHSN HV Module, 2013 to 2018[a]

Adverse Reaction	All reported reactions (N, % of total)[b]	Reactions satisfying case definition and imputability criteria[c]	Serious reactions (N, %)[d]	Fatal reactions (N)	Rate of Adverse Reactions	Rate of serious reactions
All adverse reactions	23,083 (100.0%)	18,308 (79.3%)	1340 (7.3%)	23	219.49	16.06
Allergic	8223 (35.6%)	7668 (93.3%)	579 (7.6%)	1	91.93	6.94
Febrile nonhemolytic transfusion reaction	10,621 (46.0%)	7609 (71.6%)	128 (1.7%)	0	91.22	1.53
Delayed serologic transfusion reaction	1257 (5.4%)	1053 (83.8%)	3 (0.3%)	0	12.62	0.04
Transfusion-associated circulatory overload	1143 (5.0%)	934 (81.7%)	353 (37.8%)	8	11.20	4.23
Transfusion-associated dyspnea	456 (2.0%)	339 (74.3%)	76 (22.4%)	1	4.06	0.91
Hypotensive	707 (3.1%)	271 (38.3%)	75 (27.7%)	2	3.25	0.90
Delayed hemolytic transfusion reaction	361 (1.6%)	260 (72.0%)	33 (12.7%)	1	3.12	0.40
Acute hemolytic transfusion reaction	142 (0.6%)	75 (52.8%)	20 (26.7%)	1	0.90	0.24
Transfusion-related acute lung injury	87 (0.4%)	61 (70.1%)	44 (72.1%)	6	0.73	0.53
Transfusion-transmitted infection	85 (0.4%)	37 (43.5%)	28 (75.7%)	3	0.44	0.34
Posttransfusion purpura	1 (0.0%)	1 (100.0%)	1 (100.0%)	0	0.01	0.01

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Perspectiva Histórica

- **REDS III**
- **Varios investigadores en un mismo centro revisaron al azar 200 transfusiones por mes en los últimos 6 meses en 4 hospitales de nivel 3**
- **Revisión de EMR: SV, RX de tórax, otros paraclínicos**
- **Data fue entonces revisada por 3 expertos (estudio ciego)**

Hendrickson JE, Roubinian NH, Chowdhury D, Brambilla D, Murphy EL, Wu Y, Ness PM, Gehrie EA, Snyder EL, George Hauser R, Gottschall JL, Kleinman S, Kakaiya R, Strauss RG. Incidence of transfusion reactions: a multicenter study utilizing systematic active surveillance and expert adjudication. Transfusion. 2016 Oct;56(10):2587-2596. doi: 10.1111/trf.13730. Epub 2016 Jul 26.

Perspectiva Histórica

- **REDS III**
- **Revisión retrospectiva de 27,846 transfusiones/6 meses en 4 centros académicos**
- **4.857 transfusiones (17.4%), 102 episodios asociados con una reacción seria**
- **TACO fue la reacción cardiopulmonar más frecuente**

TABLE 1. Patient characteristics for TACO, TRALI, and all screened patients

Characteristic*	TACO, n = 39	Possible TRALI, n = 4	All screened cases, n = 4857
Age: Median ± SD, years	61 ± 17	58 ± 9	59 ± 16
Sex: Female, %	41	50	47
Race, %			
White	72	50	70
Black	8	0	11
Hispanic	8	25	5
Asian	8	0	4
Other or unknown	4	25	10
Location of transfusion, %			
General ward	33	25	50
ICU	41	75	34
OR	21	0	10
Other	5	0	6
Blood type, %			
A	31	25	36
B	26	0	13
AB	3	0	5
O	40	75	45
Missing	0	0	1
Deceased, %	15	25	14

* No statistically significant differences were found between any of these variables for TACO cases or all screened cases.
TACO = transfusion-associated circulatory overload; TRALI = transfusion-related acute lung injury; SD = standard deviation; ICU = intensive care unit; OR, operating room.

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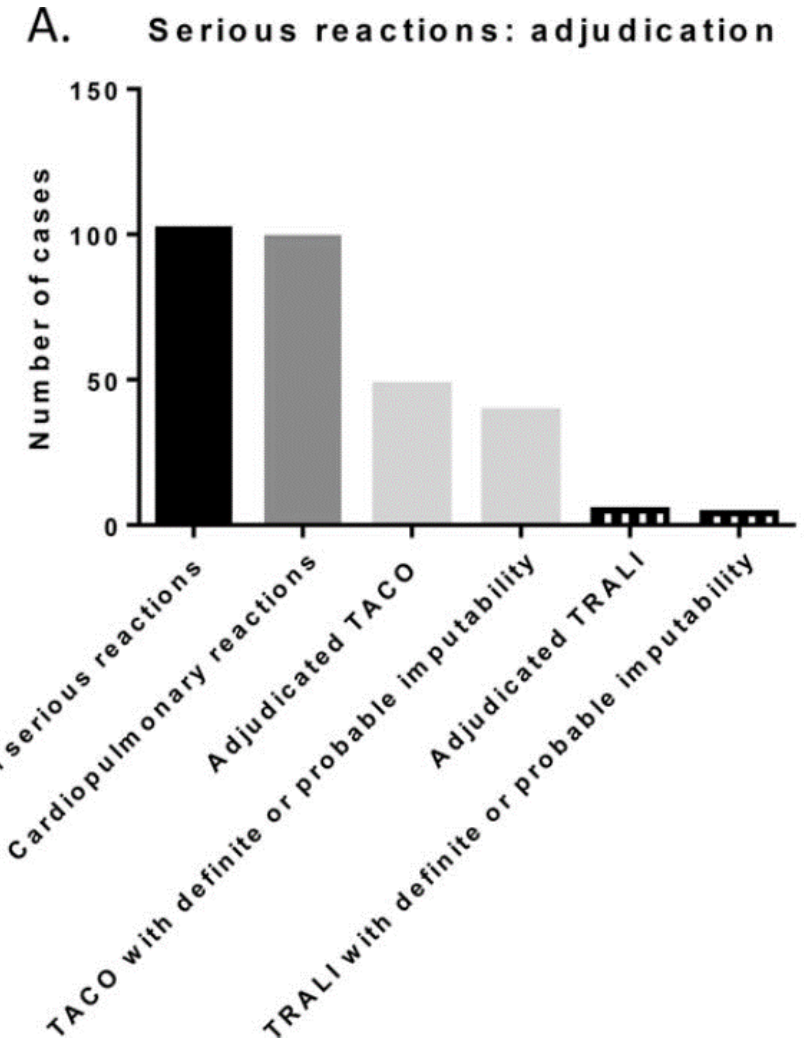

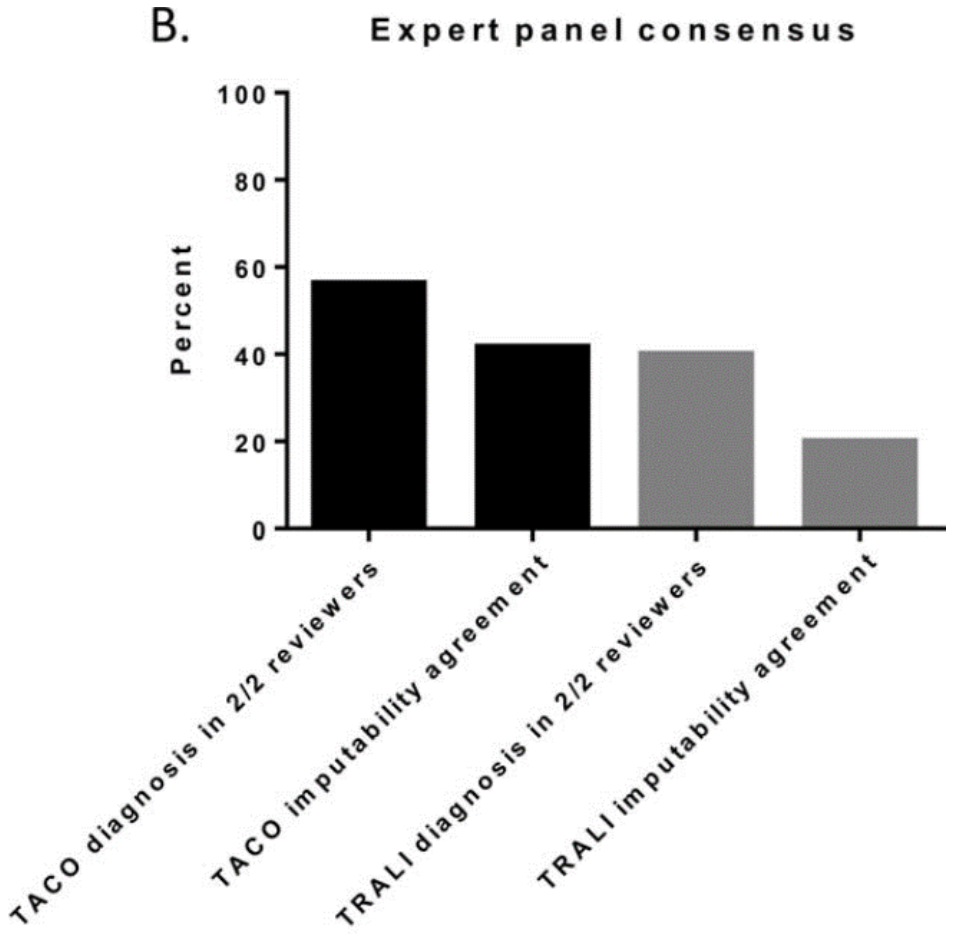

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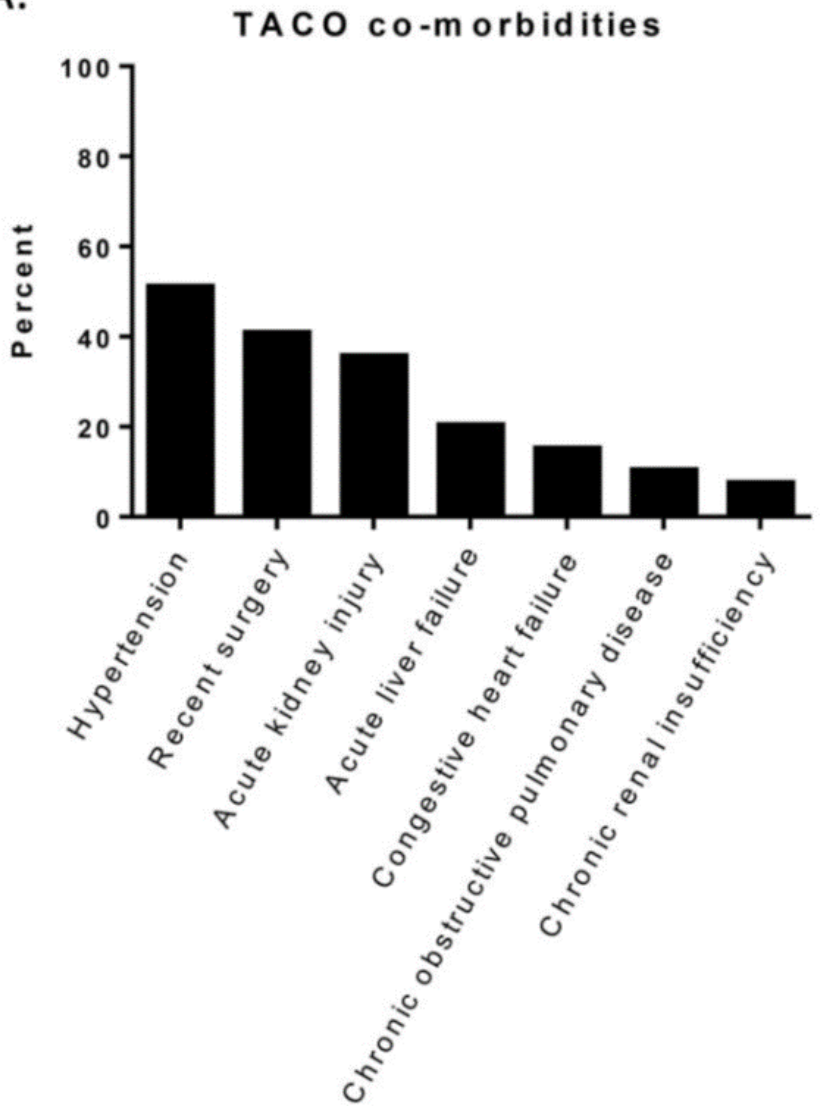
Hendrickson JE, Roubinian NH, Chowdhury D, Brambilla D, Murphy EL, Wu Y, Ness PM, Gehrie EA, Snyder EL, George Hauser R, Gottschall JL, Kleinman S, Kakaiya R, Strauss RG. Incidence of transfusion reactions: a multicenter study utilizing systematic active surveillance and expert adjudication. Transfusion. 2016 Oct;56(10):2587-2596. doi: 10.1111/trf.13730. Epub 2016 Jul 26.

Perspectiva Histórica

A.



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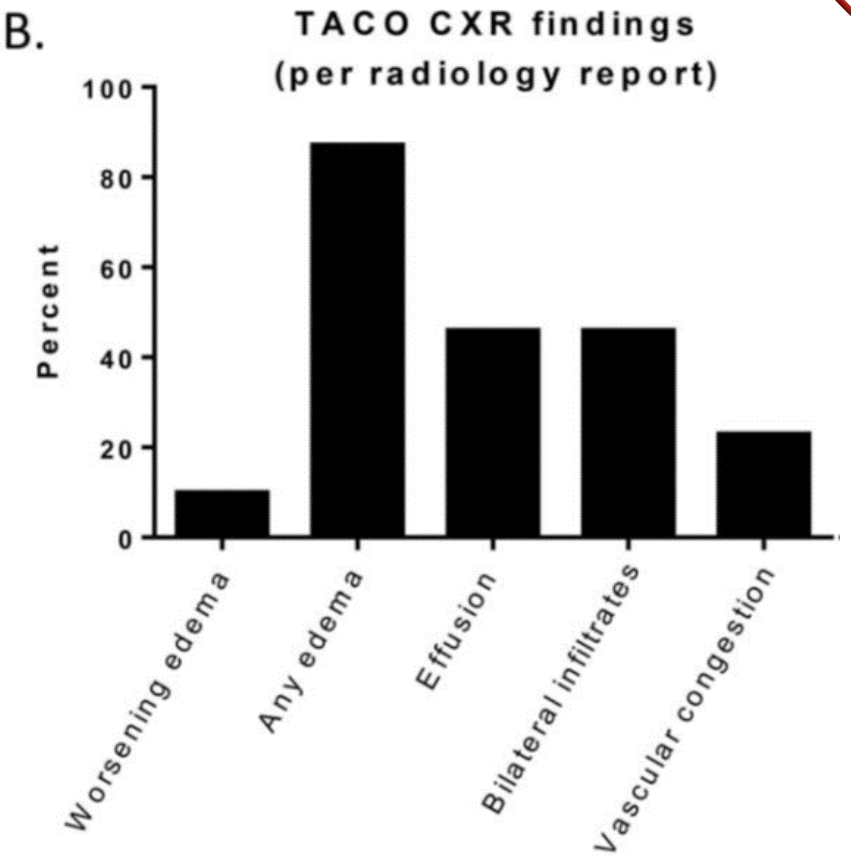

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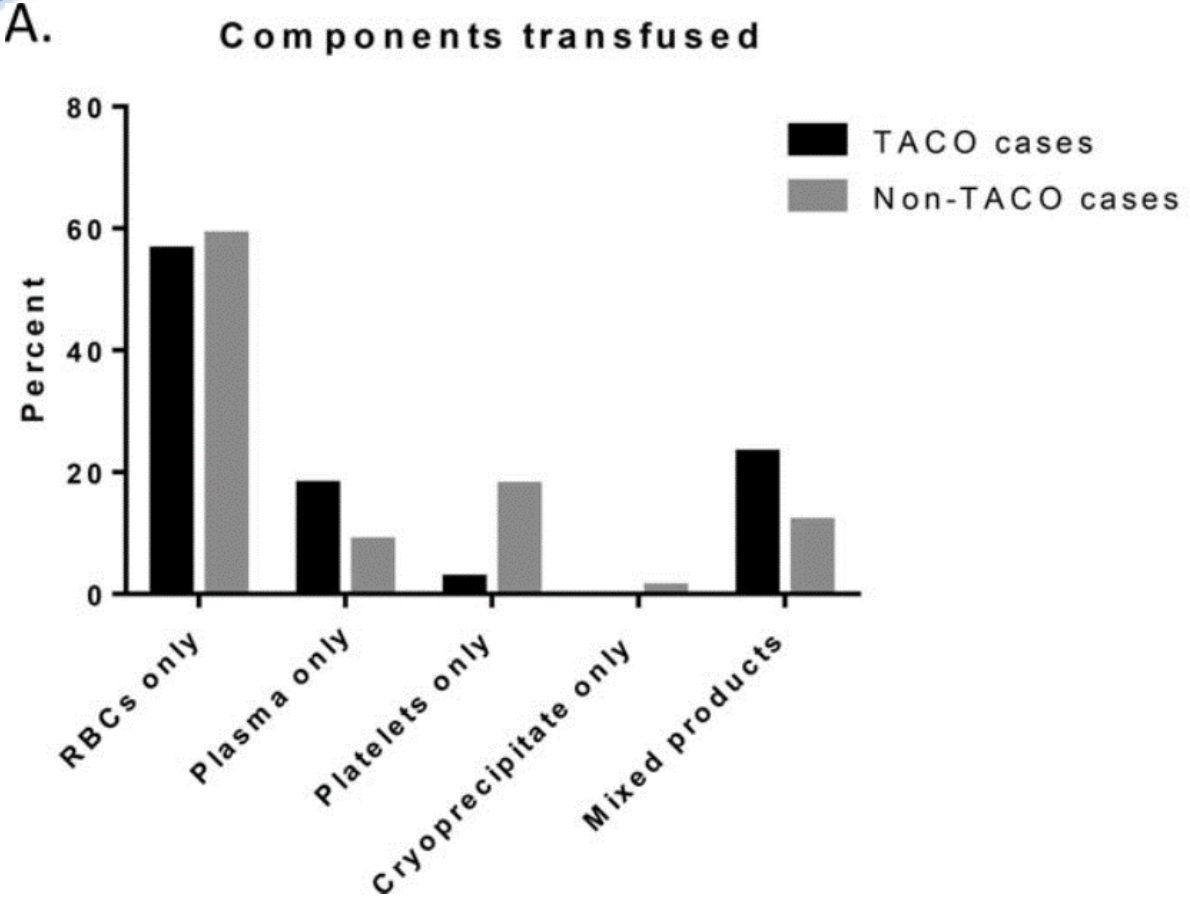

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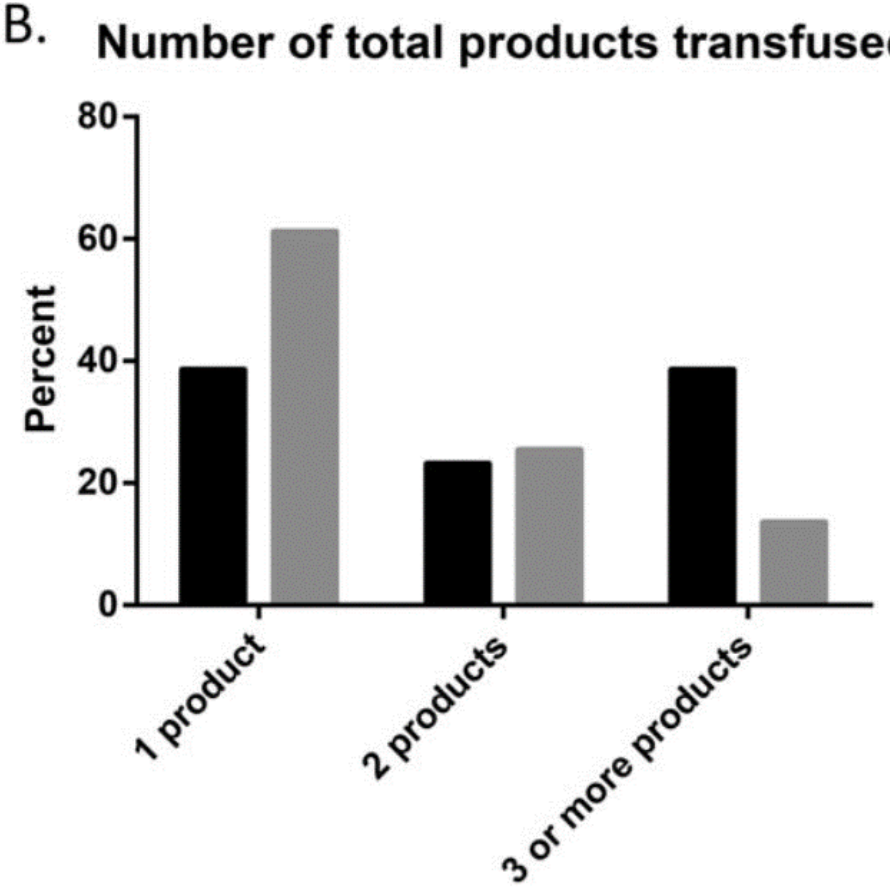

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Perspectiva Histórica

- **REDS III**
- **Revisión de historias clínicas evidencio que los clínicos pensaron en una reacción transfusional en varios casos, sin embargo, esto no fue comunicado al laboratorio (solo 5.1% de los casos de TACO fueron reportados)**

Hendrickson JE, Roubinian NH, Chowdhury D, Brambilla D, Murphy EL, Wu Y, Ness PM, Gehrie EA, Snyder EL, George Hauser R, Gottschall JL, Kleinman S, Kakaiya R, Strauss RG. Incidence of transfusion reactions: a multicenter study utilizing systematic active surveillance and expert adjudication. Transfusion. 2016 Oct;56(10):2587-2596. doi: 10.1111/trf.13730. Epub 2016 Jul 26.

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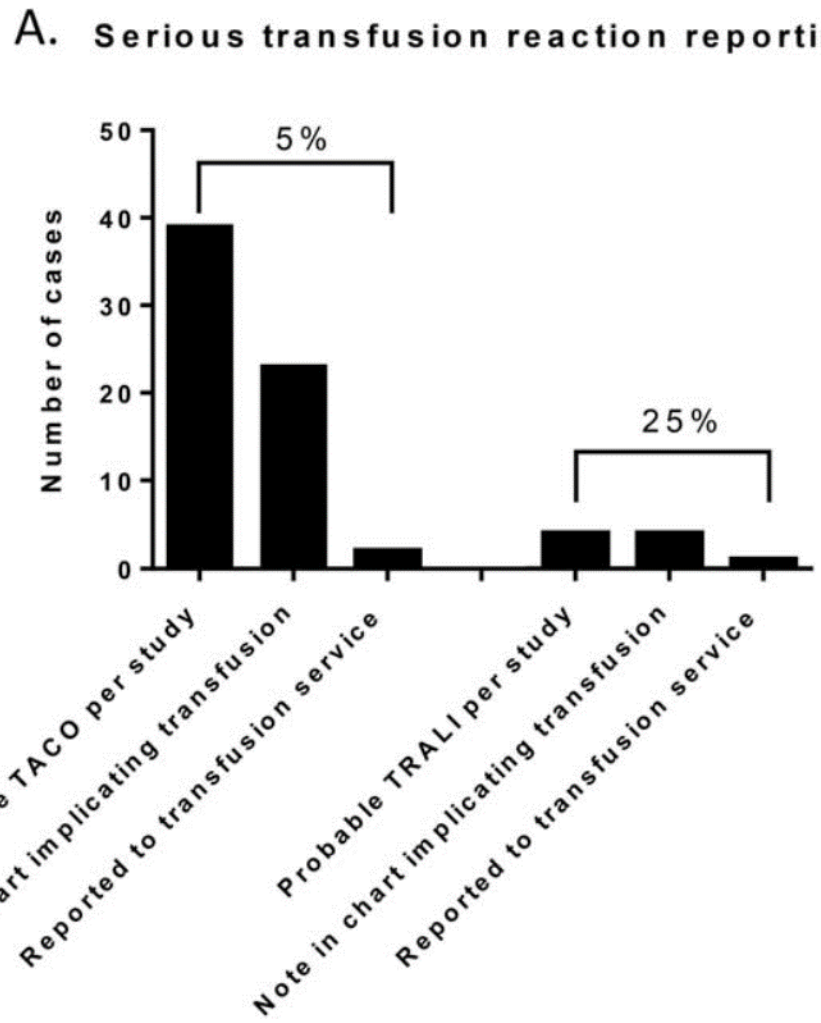

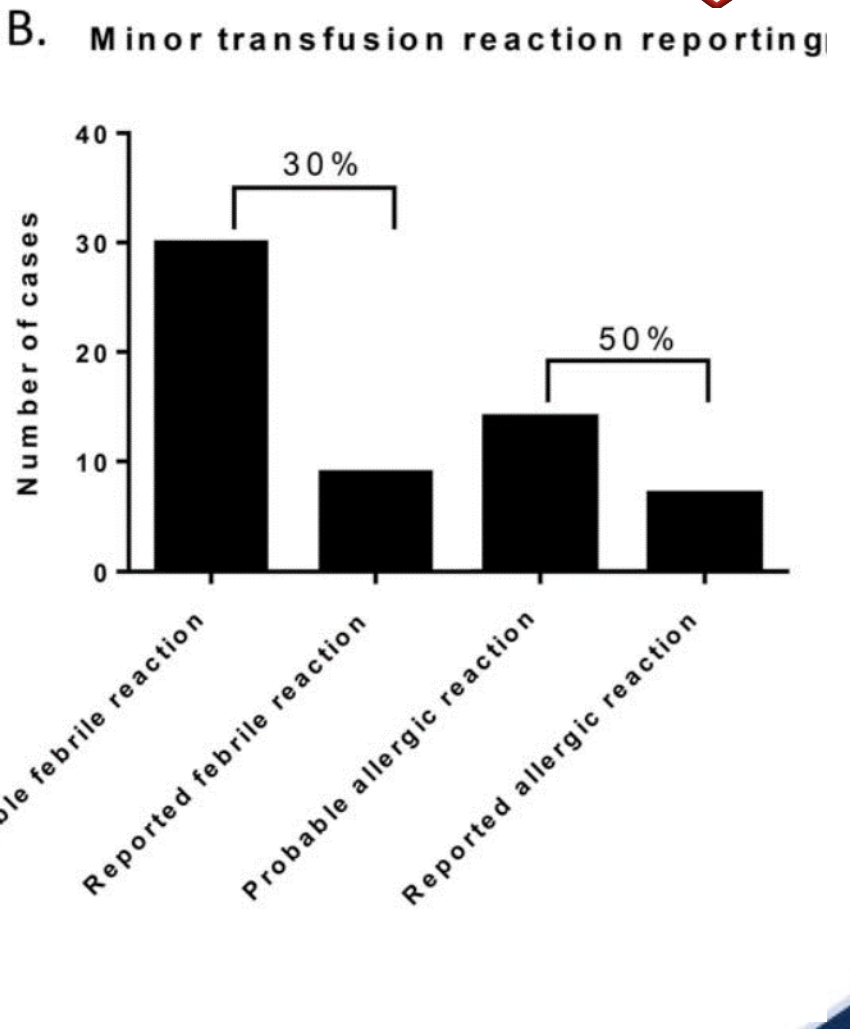

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Perspectiva Histórica

- **Estudio de mejoramiento de calidad. Reportes de reacciones transfusionales 2014-2016**
- **Test reflejo para evaluación de reacción transfusional**
- **53.647 componentes sanguíneos transfundidos**
- **478 eventos fueron investigados**

Chester Andrzejewski Jr 1, Lynne O'Hearn, Joan Rock, Kelly Passanisi, Lynn Eaton, Alexander Knee, Susmitha Edappallath, Michael Merola, Darlene Cloutier, Paul Visintainer, Vandita Johari. Enhancing hemotherapy safety through pertinent diagnostic testing and electronic "provisional diagnosis" reporting: expanding roles for blood bank technologists in biovigilance and patient safety. Transfusion. 2018 Jul;58(7):1708-1717. doi: 10.1111/trf.14769. Epub 2018 Jul 8.

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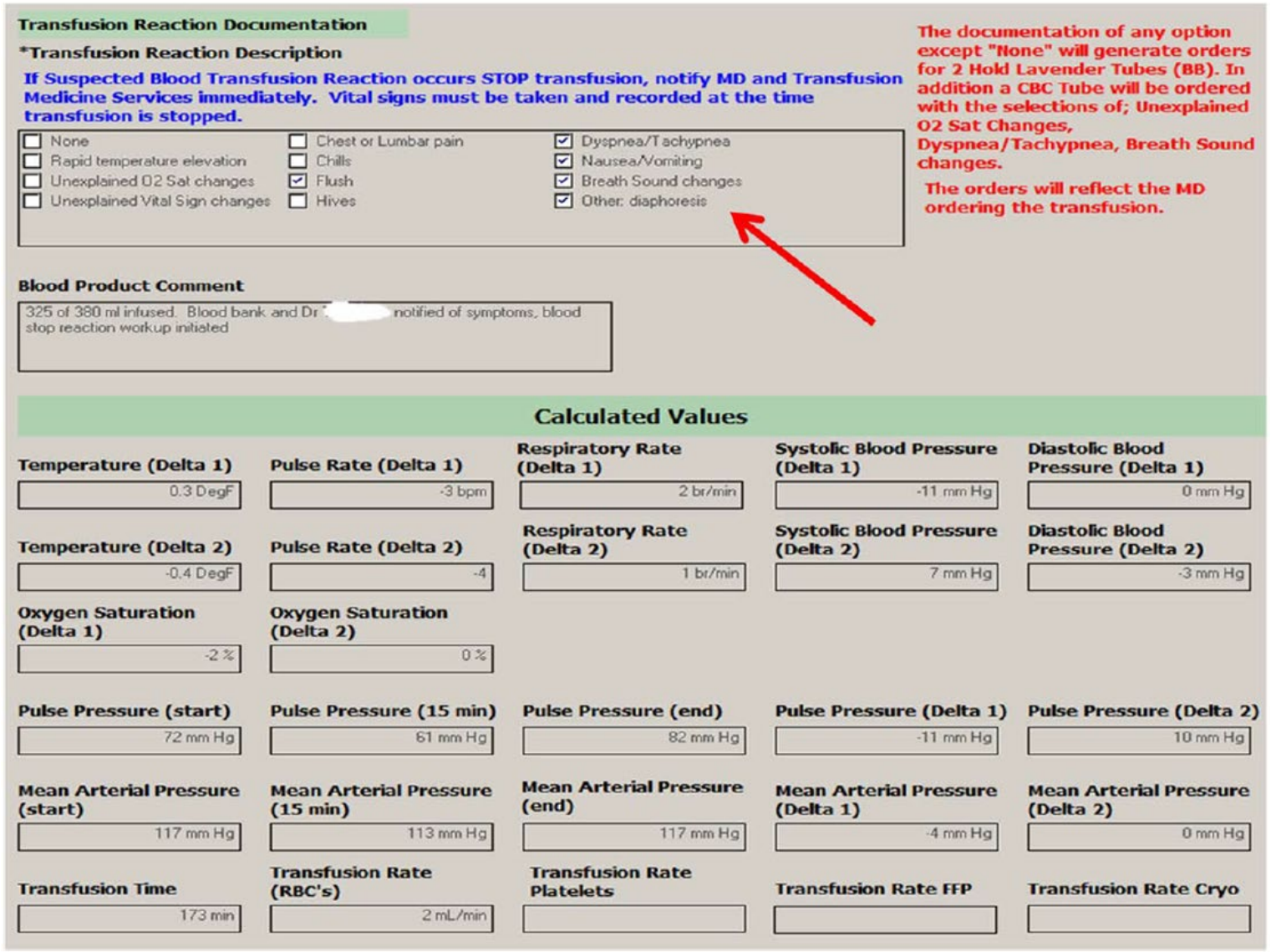

Transfusion Reaction Documentation

***Transfusion Reaction Description**

If Suspected Blood Transfusion Reaction occurs STOP transfusion, notify MD and Transfusion Medicine Services immediately. Vital signs must be taken and recorded at the time transfusion is stopped.

☐ None	☐ Chest or Lumbar pain	☑ Dyspnea/Tachypnea
☐ Rapid temperature elevation	☐ Chills	☑ Nausea/Vomiting
☐ Unexplained O2 Sat changes	☑ Flush	☑ Breath Sound changes
☐ Unexplained Vital Sign changes	☐ Hives	☑ Other: diaphoresis

The documentation of any option except "None" will generate orders for 2 Hold Lavender Tubes (BB). In addition a CBC Tube will be ordered with the selections of; Unexplained O2 Sat Changes, Dyspnea/Tachypnea, Breath Sound changes.

The orders will reflect the MD ordering the transfusion.

Blood Product Comment

325 of 380 ml infused. Blood bank and Dr [redacted] notified of symptoms, blood stop reaction workup initiated

Calculated Values

Temperature (Delta 1)	**Pulse Rate (Delta 1)**	**Respiratory Rate (Delta 1)**	**Systolic Blood Pressure (Delta 1)**	**Diastolic Blood Pressure (Delta 1)**
0.3 DegF	-3 bpm	2 br/min	-11 mm Hg	0 mm Hg
Temperature (Delta 2)	**Pulse Rate (Delta 2)**	**Respiratory Rate (Delta 2)**	**Systolic Blood Pressure (Delta 2)**	**Diastolic Blood Pressure (Delta 2)**
-0.4 DegF	-4	1 br/min	7 mm Hg	-3 mm Hg
Oxygen Saturation (Delta 1)	**Oxygen Saturation (Delta 2)**			
-2 %	0 %			
Pulse Pressure (start)	**Pulse Pressure (15 min)**	**Pulse Pressure (end)**	**Pulse Pressure (Delta 1)**	**Pulse Pressure (Delta 2)**
72 mm Hg	61 mm Hg	82 mm Hg	-11 mm Hg	10 mm Hg
Mean Arterial Pressure (start)	**Mean Arterial Pressure (15 min)**	**Mean Arterial Pressure (end)**	**Mean Arterial Pressure (Delta 1)**	**Mean Arterial Pressure (Delta 2)**
117 mm Hg	113 mm Hg	117 mm Hg	-4 mm Hg	0 mm Hg
Transfusion Time	**Transfusion Rate (RBC's)**	**Transfusion Rate Platelets**	**Transfusion Rate FFP**	**Transfusion Rate Cryo**
173 min	2 mL/min			

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Perspectiva Histórica

TABLE 2. Checklist strategy for pTACO reflex testing arc activation at BMC

Any one of the following parameters activates the ordering by the Blood Bank of the Medical Director preapproved NT Pro-BNP reflex testing strategy:

- **Pulse pressure (PP) ≥ 65 mmHg** (at any time point) *and* a positive change in **pulse pressure delta 1** *or* **pulse pressure delta 2 ≥8 mmHg;**
- **History of prior STR** diagnosed as **TACO.** (Note: Check serologic and/or STR blood bank files and attach to STR episode paperwork);
- Patient shows **any one** of the signs and symptoms of **transfusion-associated adverse pulmonary sequelae**, which includes:

☐ Dyspnea: Shortness of breath, labored or difficult breathing
☐ Tachypnea: Rapid breathing
☐ Unexplained decrease of 3% or greater from the pretransfusion baseline O_2 saturation value at any time
☐ Breath sound changes
☐ Orthopnea: Difficulty breathing when lying flat
☐ Stridor: High-pitched breathing sounds
☐ Rales: Wet, crackly, rattling lung noises
☐ Wheezing
☐ Increased frothy secretions
☐ Cough
☐ Hoarseness
☐ Cyanosis
☐ Radiographic changes consistent with congestive heart failure

- **Other**: Transfusion medicine service attending physician requested activation

NT Pro-BNP = N-terminal pro-brain natriuretic peptide; TACO = transfusion-associated circulatory overload.

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Perspectiva Histórica

TABLE 3. Types and activation frequencies of various reflex testing algorithms occurring during the study interval at the index institution

Time interval (calendar year)	Total STR cases reported (n)	Indicated reflex testing algorithm*	Number of STR cases where indicated reflex testing not triggered/ performed† (n)	Number of STR cases where indicated reflex testing performed† (n)	STR cases with indicated reflex testing triggered/total STRs (%)
3/1/2014-12/31/2016	461		150	311	67.5
2014‡	130	pHemolytic	128	2	1.5
2015	182		181	1	0.5
2016	149		148	1	0.7
2014	130	pBACON	71	59	45.4
2015	182		114	68	37.4
2016	149		91	58	38.9
2014	130	pTRALI	124	6	4.6
2015	182		178	4	2.2
2016	149		147	2	1.3
2014	130	pTACO	57	73	56.2
2015	182		84	98	53.8
2016	149		73	76	51.0

* See Tables 1 and 2 for details regarding the various reflex algorithms.

† Because multiple types of reflex activations can be encountered per STR episode, the data displayed in these two columns of the individually categorized reflex parameter values cannot be summed to equal the total numbers of STR cases without or with reflex activations performed for the total study interval.

‡ Calendar year 2014 represents only 10 months of data beginning March 1, 2014.

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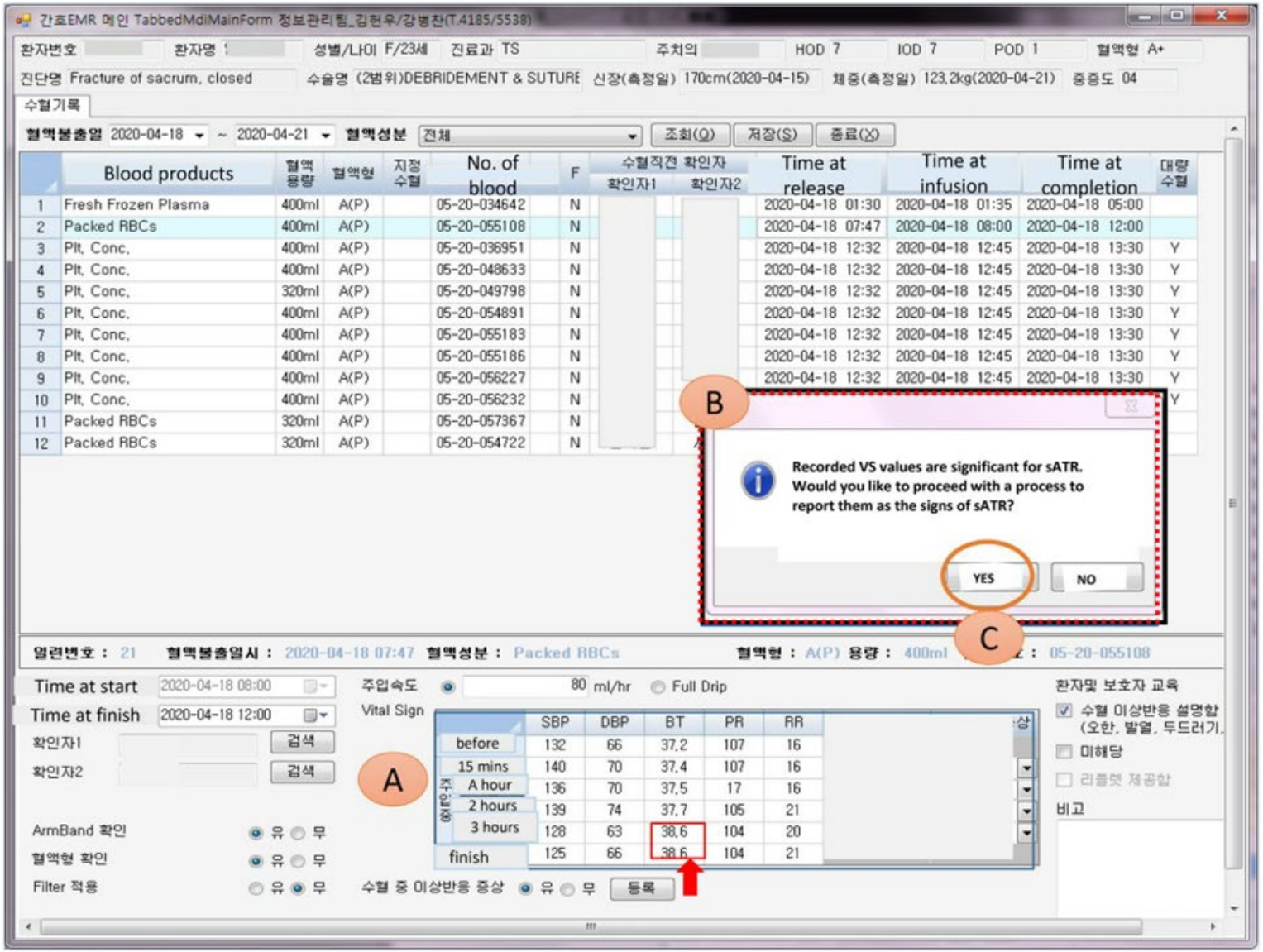
Perspectiva Histórica

- **Monitoreo de signos vitales (SV) durante transfusion (Electronic Automatic Notification System(EANS))**
- **VS durante transfusión tomados de EMR en 2018**
- **945 notificaciones y 521 eventos investigados**

Lim YA, Kim J, Park C. Early recognition of possible transfusion reactions using an electronic automatic notification system for changes in vital signs in patients undergoing blood transfusions. Transfusion. 2020 Sep;60(9):1950-1959. PMID: 32687234.

Perspectiva Histórica



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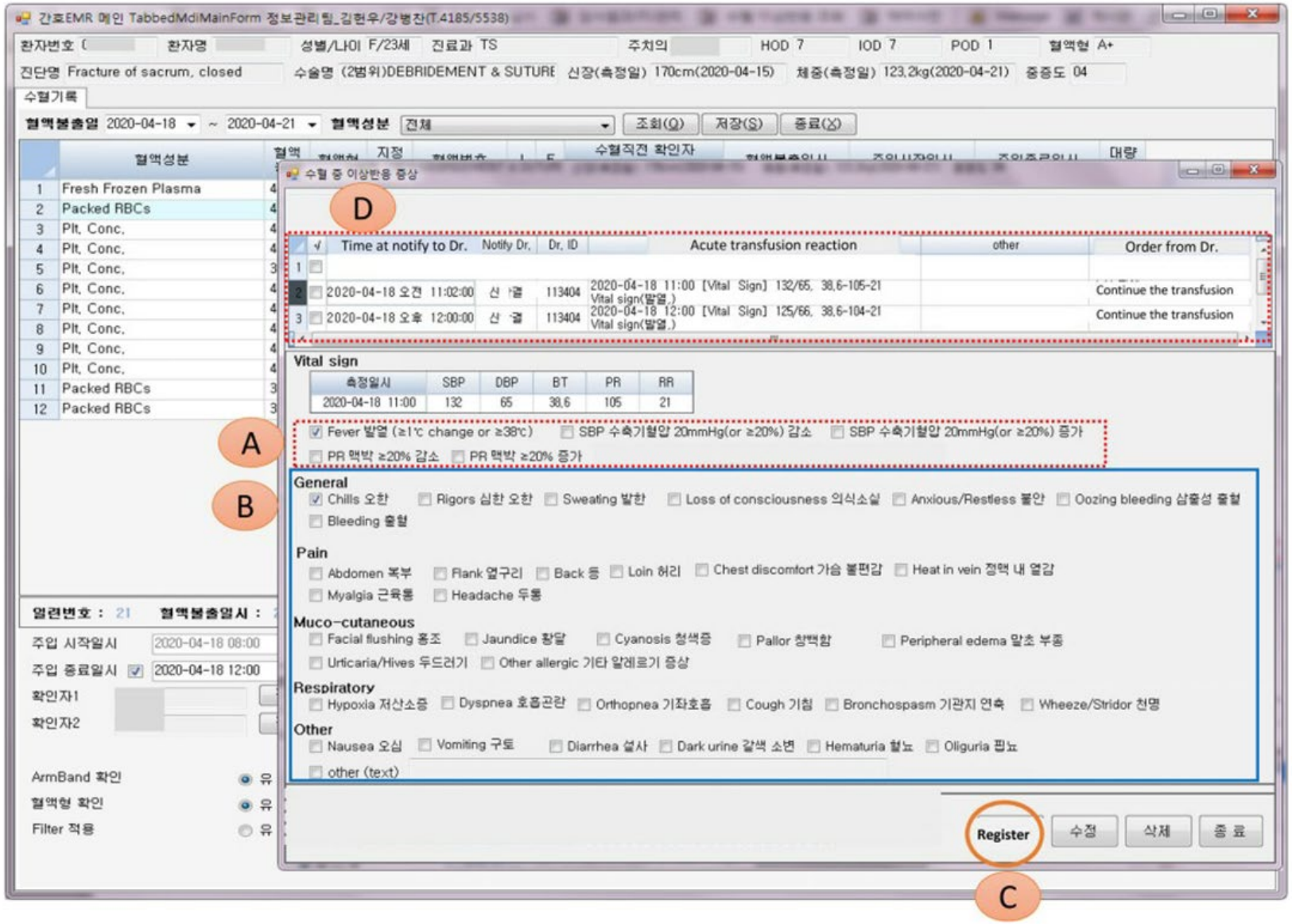

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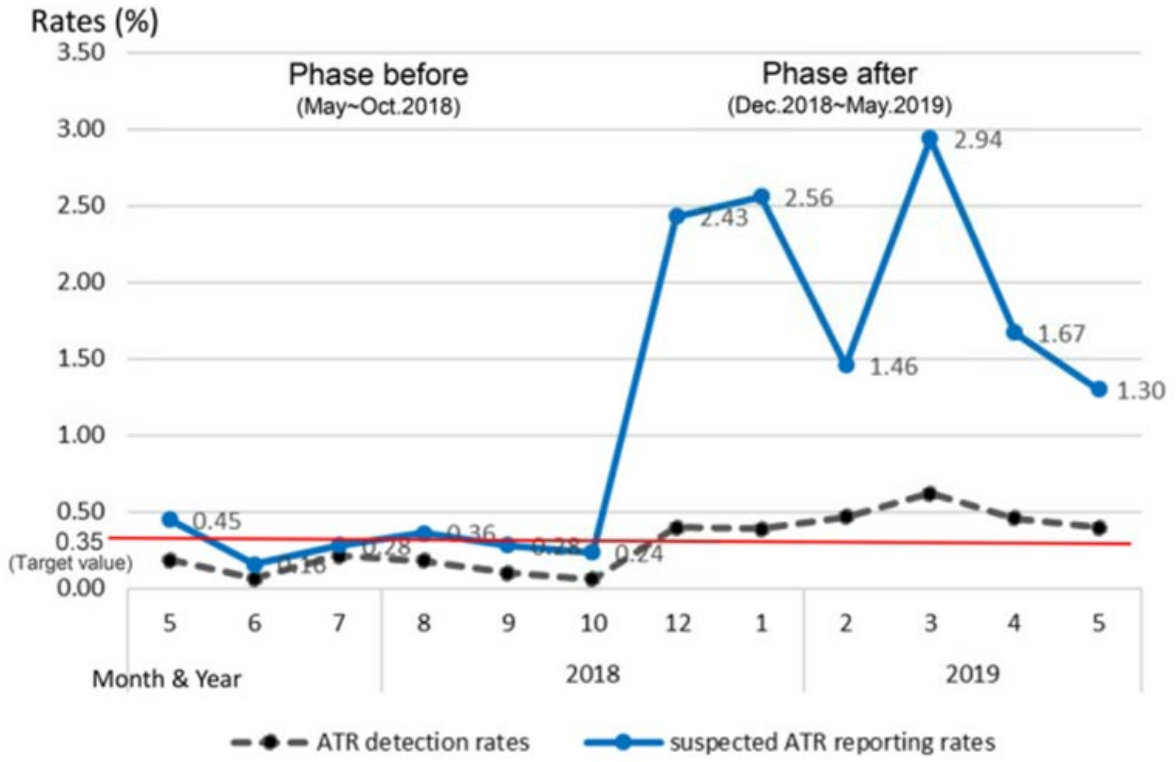
Perspectiva Histórica

- **Monitoreo de SV durante transfusion**
- **925 notificaciones y 521 reacciones detectadas**



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Hemovigilancia (HVU) en tiempo real en un Hospital Oncológico

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TRANSFUSIONAL Y TERAPIA CELULAR
CONECTADOS CON EL PACIENTE
Octubre 31 a Noviembre 3 del 2024
Bogotá Colombia, Hotel Sheraton

- **Entre FY-2011-FY2015 se transfundieron 998.550 componentes sanguíneos en**
- **Equivalentes a 522.742 transfusiones**
- **Entre FY-2011-FY2015 se reportaron 1.248 reacciones transfusionales (0,24 % del total de transfusiones)**

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HVU en tiempo real en un Hospital Oncológico

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- 45% de reacciones reportadas fueron alérgicas
- 25% de reacciones reportadas fueron febriles
- 25% de reacciones reportadas fueron consideradas indeterminadas
- 0,25% fueron diagnosticadas como TACO

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- **Las reacciones transfusionales son parte de un espectro clínico, sin embargo, hay desconexión entre el equipo clínico y el laboratorio**
- **La prevención y detección de eventos adversos relacionados con transfusión es parte integral del cuidado del paciente**

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- **Guía regulatoria**
- **42 CFR 493.1271(e)**
  - **(1) De acuerdo a procedimientos establecidos, el laboratorio que hace pruebas de crossmatch y entrega productos sanguíneos, debe investigar todas las reacciones transfusionales que ocurran en sus instalaciones y debe hacer recomendaciones al grupo clínico con relación a mejoramiento de los procedimientos de transfusion**

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- **Guía regulatoria**
- **42 CFR 493.1271(e)**
  - **(2) El laboratorio debe documentar que todas las acciones remediales sean llevadas a cabo para prevenir reacciones transfusionales, y debe revisar procedimientos y guías para asegurar la seguridad del paciente transfundido**

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- **Guía regulatoria**
- **42 CFR 493.1103 (d)**
  - **(d)Investigación de reacción transfusional. La institución hospitalaria debe tener procedimientos para prevenir reacciones transfusionales y prontamente identificar, investigar y reportar productos sanguíneos, y reacciones transfusionales al laboratorio y cuando sea apropiado reportar a las autoridades del estado y federales.**

Product	FY2014	FY2015	FY2016 EPIC (less patients)	FY2017	National 2015
RBC	57,283	57,131	52,866	56,278	11,264,000
RDP	116,880	110,790	105,172	110,268	
SDP	8,037	8,115	7,368	7,869	1,807,000
PLT doses (pooled)	27,125	27,168	26,293	35,436	172,000
FFP	7,269	7,045	6,276	7,327	2,727,000
CRYO	3,480	3,839	2,968	3,365	1,167,000
GRAN	1,063	749	504	491	
Total	194,012 106,351	187,669 104,577	175,154 96,275	185,598 102,897	17,137,000

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Año	Componentes Transfundidos	Promedio de dosis transfundidos por mes	Transfusiones	Reacciones Transfusionales/Mes (Reporte Pasivo)	% of Rx Tx por año
2013	192,641	8,027	96,320	19	0.24
2014	194,012	8,083	97,006	22	0.26
2015	187,669	7,820	93,835	24	0.30
2016	175,154	7,298	87,577	25	0.34
2017	185,598	7,733	92,799	34	0.44
2018	194,402	8,100	97,201	29	0.36
2019	185,580	8,237	98,879	29	0.28

11,349,000 RBC transfused in 2015.
1,983,000 whole blood derived and apheresis platelets were infused in the US in 2015

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- **Situación en 2019**
- **Reporte pasivo es el sistema más comúnmente usado**
  - **Vigilancia activa es un sistema más apropiado**
- **Se implemento un sistema de hemovigilancia en tiempo real**

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- **Algoritmo de tamizaje usando variables asociadas con reacción transfusional**
  - **Software: IS, EPIC, CERNER, Safetrace**
  - **Personal (peopleware): laboratorio, enfermería, pacientes**

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- SOBRECARGA CIRCULATORIA ASOCIADA A TRANSFUSION (TACO)
- LESION PULMONAR AGUDA RELACIONADA CON TRANSFUSION (TRALI)
- REACCION TRANSFUSIONAL ALERGICA
- DISNEA ASOCIADA A TRANSFUSION (TAD)
- REACCION TRANSFUSIONAL FEBRIL NO HEMOLITICA (FNHTR)
- REACCION TRANSFUSIONAL HEMOLITICA AGUDA (AHTR)
- REACCION TRANSFUSIONAL HIPOTENSIVA
- REACCION HEMOLITICA TRANSFUSIONAL TARDIA (RHTT)
- REACCION SEROLOGICA TRANSFUSIONAL TARDIA-ALOINMUNIZACION (DSTR)
- ENFERMEDAD INJERTO VS HOSPEDERO ASOCIADA A LA TRANSFUSION (TAGVHD)
- PURPURA POS-TRANSFUSIONAL (PTP)
- INFECCION TRANSMITIDA POR TRANSFUSION (TTI)
- COMPLICACION TRANSFUSIONAL NO CLASIFICABLE

https://www.cdc.gov/nhsn/pdfs/biovigilance/bv-hv-protocol-current.pdf

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- **Tecnología digital facilita el análisis de información compleja para decisiones clínicas**
- **Monitoreo en tiempo real llevado a cabo por clínicos expertos**
- **Facilita reconocimiento de patrones**
- **Podría permitir predicción de desenlace.**

Temperature greater than or equal to 38.0 C	Fever (rise of 1°C oral or more from the baseline temperature AND a temperature of ≥ 38°C oral)
Systolic BP change greater than 25% (pediatrics only)	Systolic BP Changed >30mmHg
Systolic Blood Pressure < 80mmHg	Change in respiratory rate greater than 25%
Change in heart rate greater than 25%	Hypoxemia (pO2 saturation less than or equal to 90% on room air)
Change in O2 Device or Increase in FiO2	**Documentation of transfusion reaction symptoms by the administering RN in the past 24 hours.**

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Perspectiva Histórica

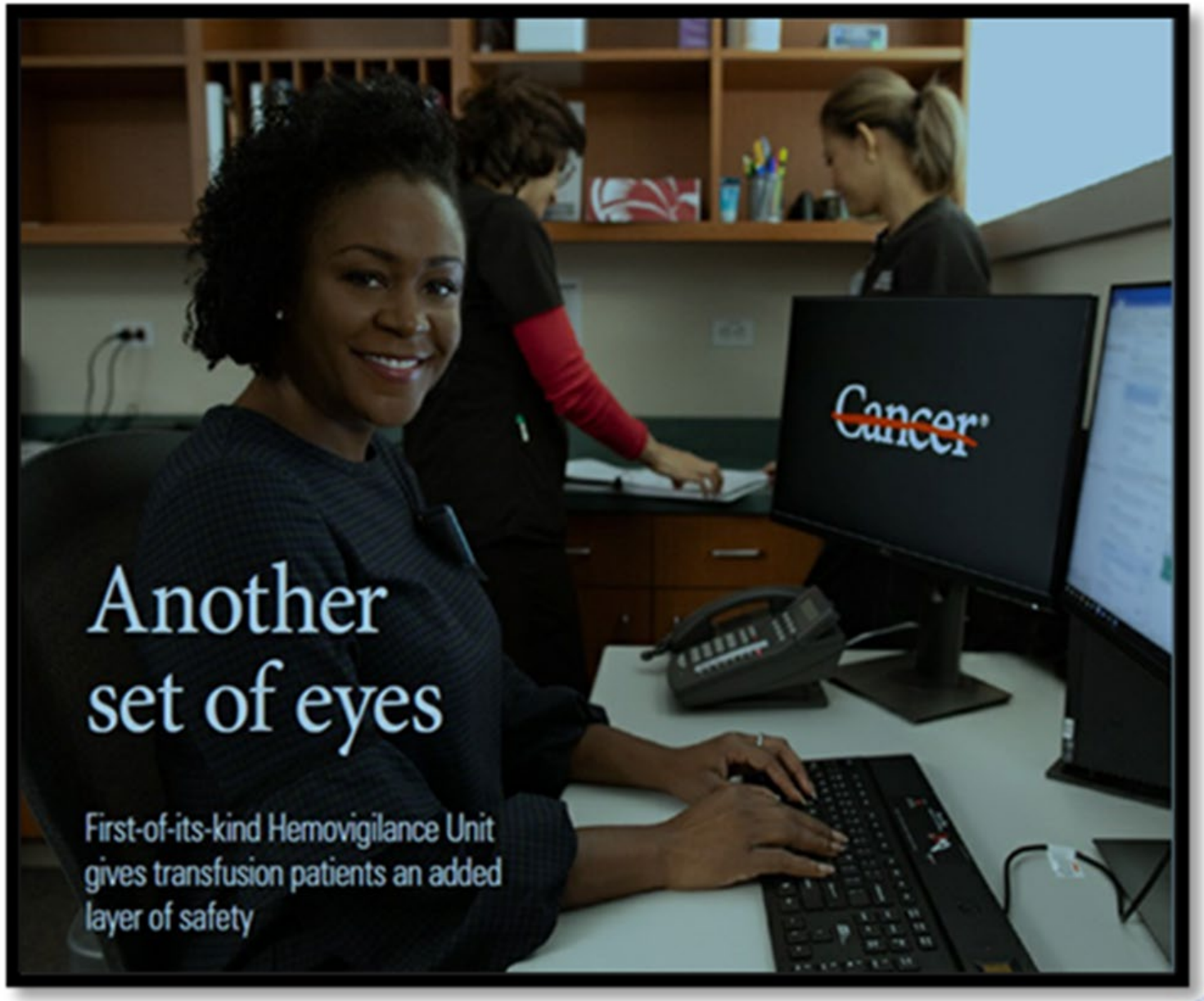

TABLE 1 Discrete data fields in EHR identify the need to investigate potential transfusion reactions

Acute reactions (real time monitoring from transfusion start until 6 h after)	**Weight**
Documentation of transfusion reaction symptoms by the patient-facing clinician (discrete field)	5
Temperature greater than or equal to 38.0°C	2
Temperature increase ≥1.0°C from pre-transfusion vitals	2
Systolic blood pressure change ≥25% if patient <18 years old	2
Systolic blood pressure change ≥30 mmHg from pre-transfusion vitals	2
Systolic blood pressure ≤80 mmHg	2
Mean arterial pressure change ≥25%	2
Oxygen saturation ≤90%	2
Change in respiratory rate ≥25%	2
Change in oxygen requirement (discrete fields in EHR)	2
Change in heart rate ≥25%	2
Patient's EHR problem list included any of the following	
Transfusion reaction	1 each
Acute congestive heart failure, heart disease, or heart failure	
Renal insufficiency, kidney failure, or kidney injury	
IgA deficiency	
Peak inspiratory pressure increase ≥25%	*2*

Acute reactions (appear in the retrospective report)	**Weight**
Anesthesiologist documents transfusion complication (appears in the retrospective report)	5
Daily total input/output balance greater than +1000 ml (appears in the retrospective report)	2
Decrease in hemoglobin of ≥25% within 24 h of transfusion from value prior to transfusion	2
Furosemide ordered within 24 h of transfusion (appears in the retrospective report)	1
Total calcium level <8.1 mg/dl within 12 h after transfusion when above threshold previously	1
Ionized calcium level <1.0 mg/dl within 12 h after transfusion when above threshold previously	1
Magnesium <1.1 mg/dl within 12 h after transfusion when above threshold previously	1
Potassium >6.0 mmol/L within 12 h after transfusion when above threshold previously	1
Patient weight increases 5% within 24 h after transfusion	*2*

TABLE 1 (Continued)

Acute reactions (appear in the retrospective report)	**Weight**
Chest x-ray ordered within 24 h of transfusion	*1*
New spherocytes present on peripheral blood smear within 24 h after transfusion	*1*
BNP ≥300 ng/L within 7 days after transfusion	*1*
BNP increase ≥25% within 7 days of transfusion compared to the value within 1 month of transfusion	*1*
Urine color abnormal on urinalysis within 24 h of transfusion	*1*
New hematuria present on urinalysis within 24 h of transfusion	*1*

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Colleen Villamin, Tonita Bates, Benjamin Mescher, Sandy Benitez, Fernando Martinez, Adriana Knopfelmacher, Mayrin Correa Medina, Kimberly Klein, Amitava Dasgupta, David A Jaffray, Carol Porter, Welela Tereffe, Luisa Gallardo, James Kelley. Digitally enabled hemovigilance allows real time response to transfusion reactions. Transfusion. 2022 Apr 20. PMID: 35442519

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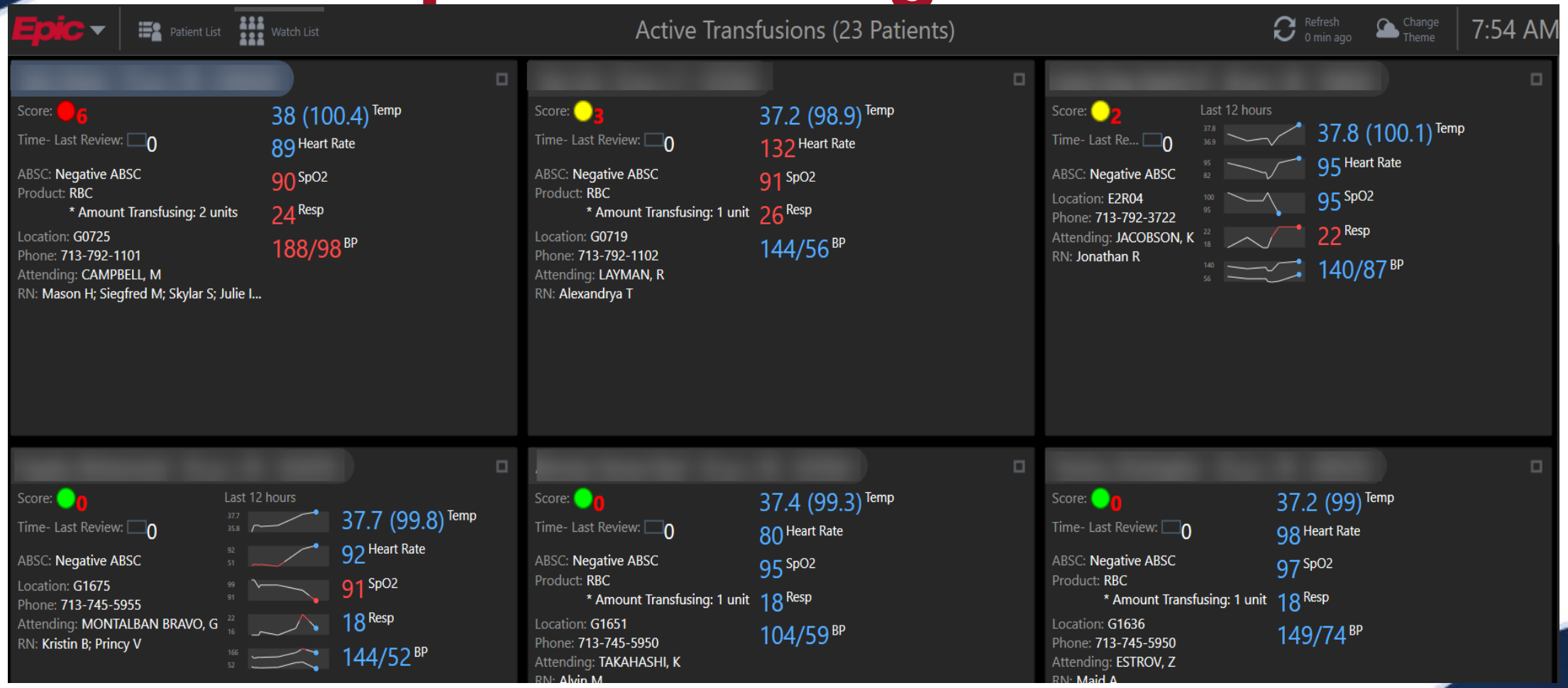

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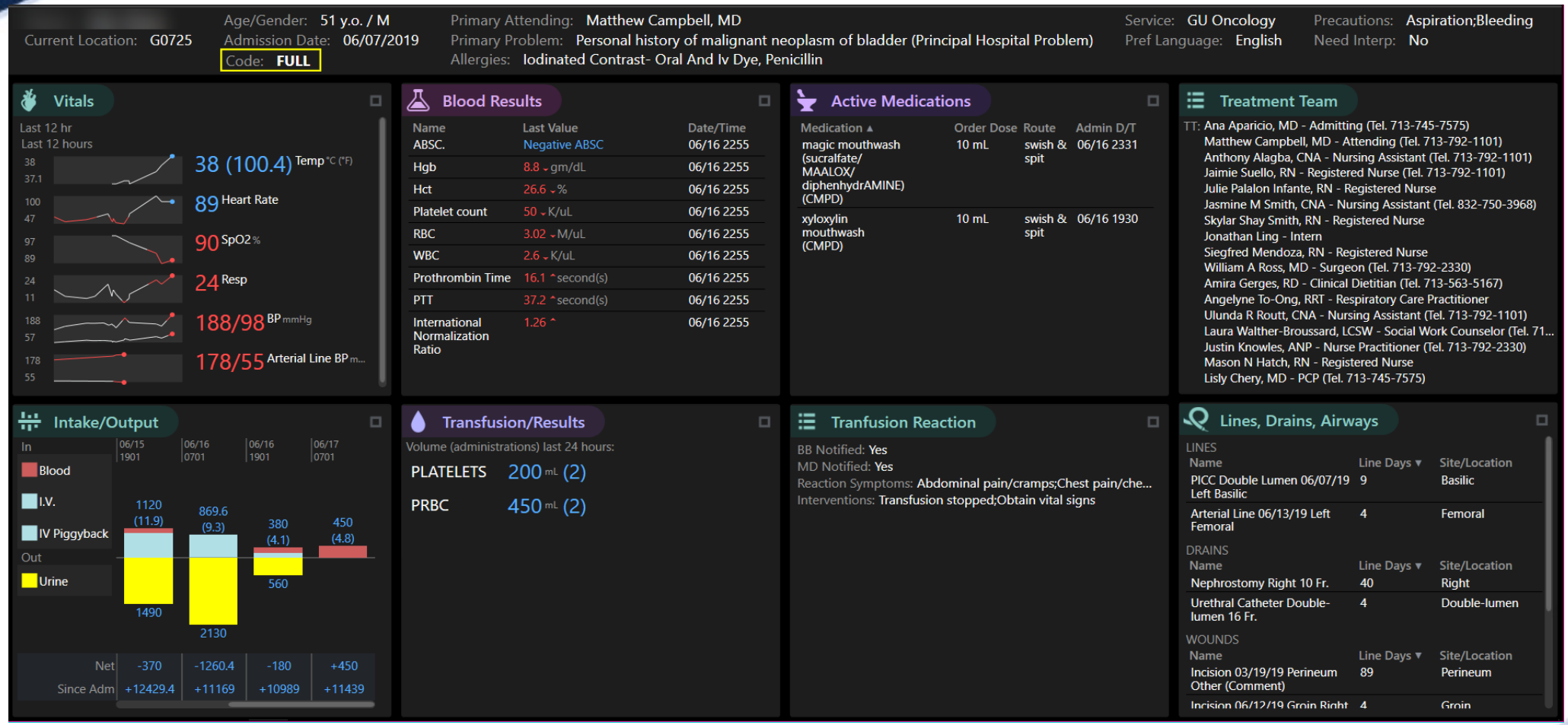

Current Location: G0725
Age/Gender: 51 y.o. / M
Admission Date: 06/07/2019
Code: FULL
Primary Attending: Matthew Campbell, MD
Primary Problem: Personal history of malignant neoplasm of bladder (Principal Hospital Problem)
Allergies: Iodinated Contrast- Oral And Iv Dye, Penicillin
Service: GU Oncology
Pref Language: English
Precautions: Aspiration;Bleeding
Need Interp: No

Vitals

Last 12 hr
Last 12 hours

38 (100.4) Temp °C (°F)
89 Heart Rate
90 SpO2 %
24 Resp
188/98 BP mmHg
178/55 Arterial Line BP m...

Blood Results

Name	Last Value	Date/Time
ABSC.	Negative ABSC	06/16 2255
Hgb	8.8 ↓ gm/dL	06/16 2255
Hct	26.6 ↓ %	06/16 2255
Platelet count	50 ↓ K/uL	06/16 2255
RBC	3.02 ↓ M/uL	06/16 2255
WBC	2.6 ↓ K/uL	06/16 2255
Prothrombin Time	16.1 ↑ second(s)	06/16 2255
PTT	37.2 ↑ second(s)	06/16 2255
International Normalization Ratio	1.26 ↑	06/16 2255

Active Medications

Medication	Order Dose	Route	Admin D/T
magic mouthwash (sucralfate/ MAALOX/ diphenhydrAMINE) (CMPD)	10 mL	swish & spit	06/16 2331
xyloxylin mouthwash (CMPD)	10 mL	swish & spit	06/16 1930

Treatment Team

TT: Ana Aparicio, MD - Admitting (Tel. 713-745-7575)
Matthew Campbell, MD - Attending (Tel. 713-792-1101)
Anthony Alagba, CNA - Nursing Assistant (Tel. 713-792-1101)
Jaimie Suello, RN - Registered Nurse (Tel. 713-792-1101)
Julie Palalon Infante, RN - Registered Nurse
Jasmine M Smith, CNA - Nursing Assistant (Tel. 832-750-3968)
Skylar Shay Smith, RN - Registered Nurse
Jonathan Ling - Intern
Siegfred Mendoza, RN - Registered Nurse
William A Ross, MD - Surgeon (Tel. 713-792-2330)
Amira Gerges, RD - Clinical Dietitian (Tel. 713-563-5167)
Angelyne To-Ong, RRT - Respiratory Care Practitioner
Ulunda R Routt, CNA - Nursing Assistant (Tel. 713-792-1101)
Laura Walther-Broussard, LCSW - Social Work Counselor (Tel. 71...
Justin Knowles, ANP - Nurse Practitioner (Tel. 713-792-2330)
Mason N Hatch, RN - Registered Nurse
Lisly Chery, MD - PCP (Tel. 713-745-7575)

Intake/Output

	06/15 1901	06/16 0701	06/16 1901	06/17 0701
In				
Blood				450 (4.8)
I.V.	1120 (11.9)	869.6 (9.3)	380 (4.1)	
IV Piggyback				
Out				
Urine	1490	2130	560	
Net	-370	-1260.4	-180	+450
Since Adm	+12429.4	+11169	+10989	+11439

Transfusion/Results

Volume (administrations) last 24 hours:
PLATELETS 200 mL (2)
PRBC 450 mL (2)

Tranfusion Reaction

BB Notified: Yes
MD Notified: Yes
Reaction Symptoms: Abdominal pain/cramps;Chest pain/che...
Interventions: Transfusion stopped;Obtain vital signs

Lines, Drains, Airways

LINES

Name	Line Days	Site/Location
PICC Double Lumen 06/07/19 Left Basilic	9	Basilic
Arterial Line 06/13/19 Left Femoral	4	Femoral

DRAINS

Name	Line Days	Site/Location
Nephrostomy Right 10 Fr.	40	Right
Urethral Catheter Double-lumen 16 Fr.	4	Double-lumen

WOUNDS

Name	Line Days	Site/Location
Incision 03/19/19 Perineum Other (Comment)	89	Perineum
Incision 06/12/19 Groin Right	4	Groin

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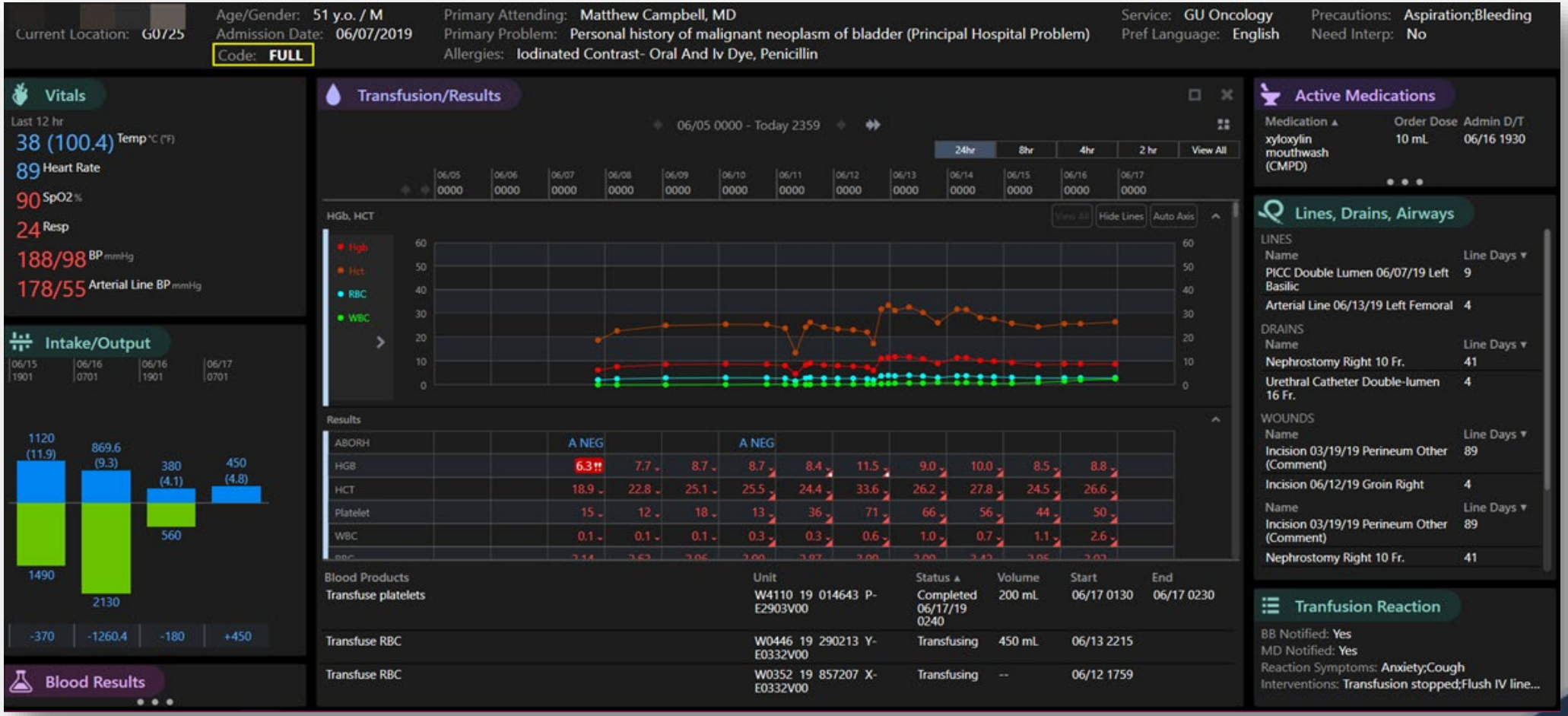

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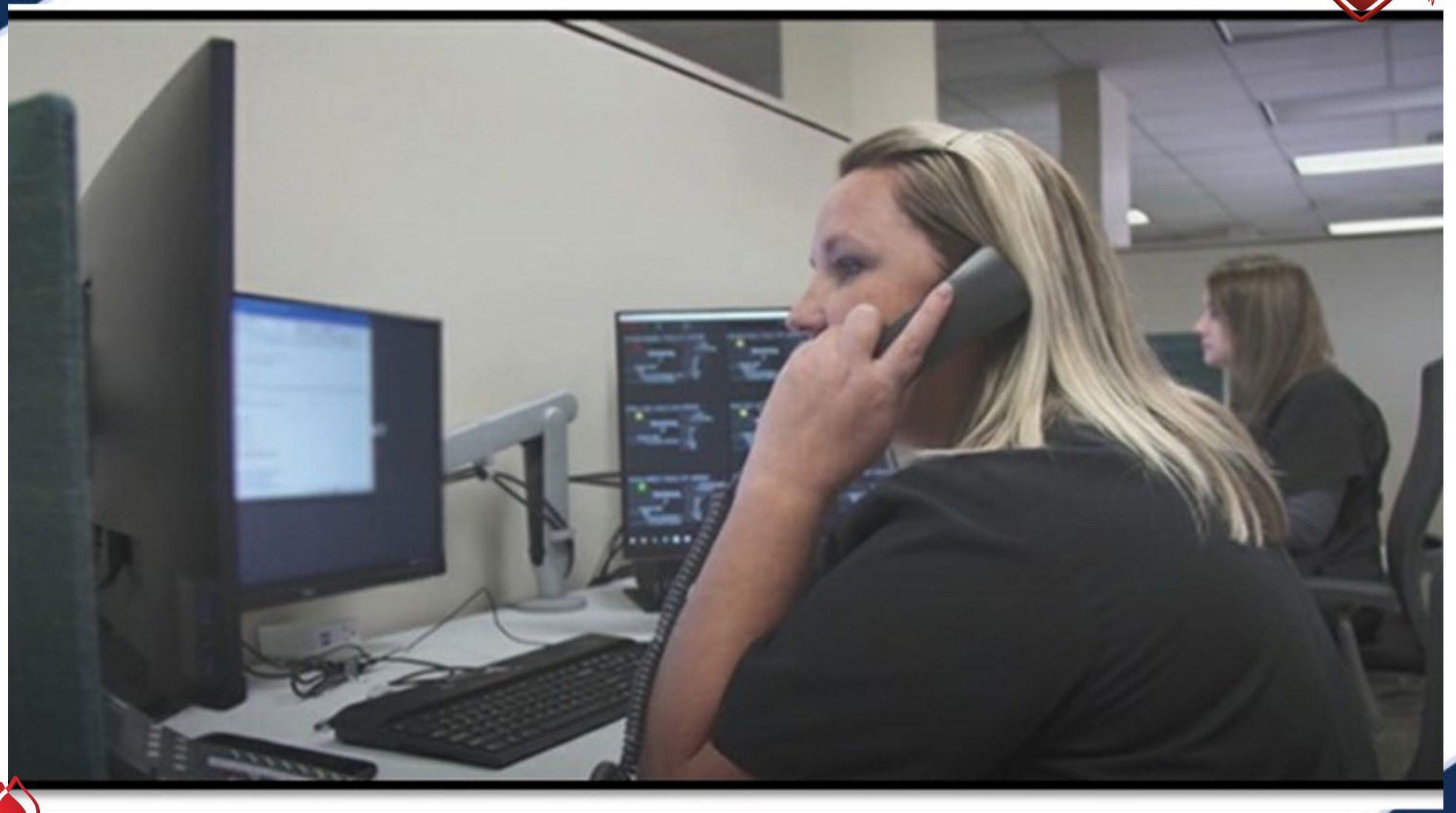
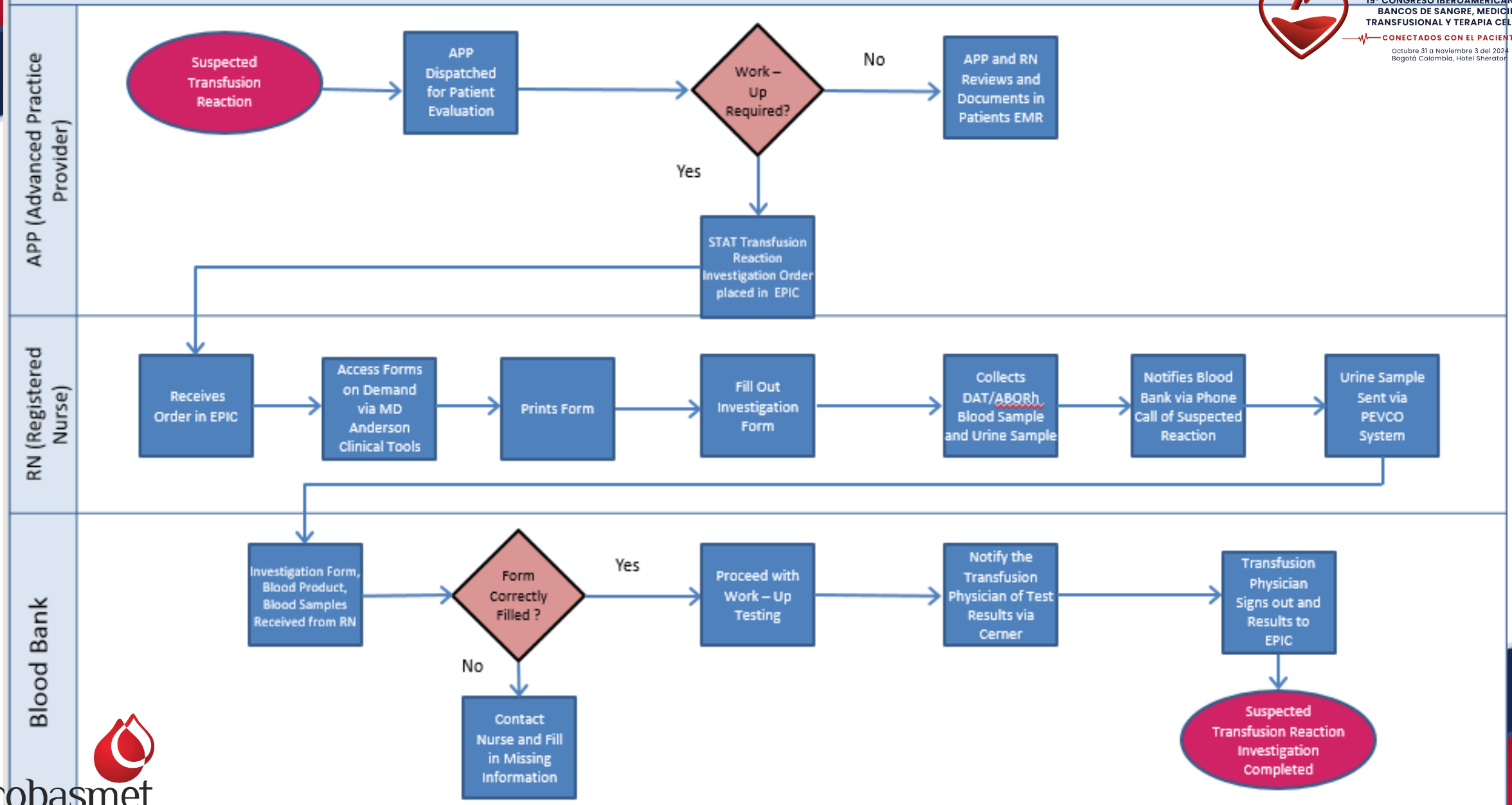


Current Transfusion Reaction Investigation Workflow



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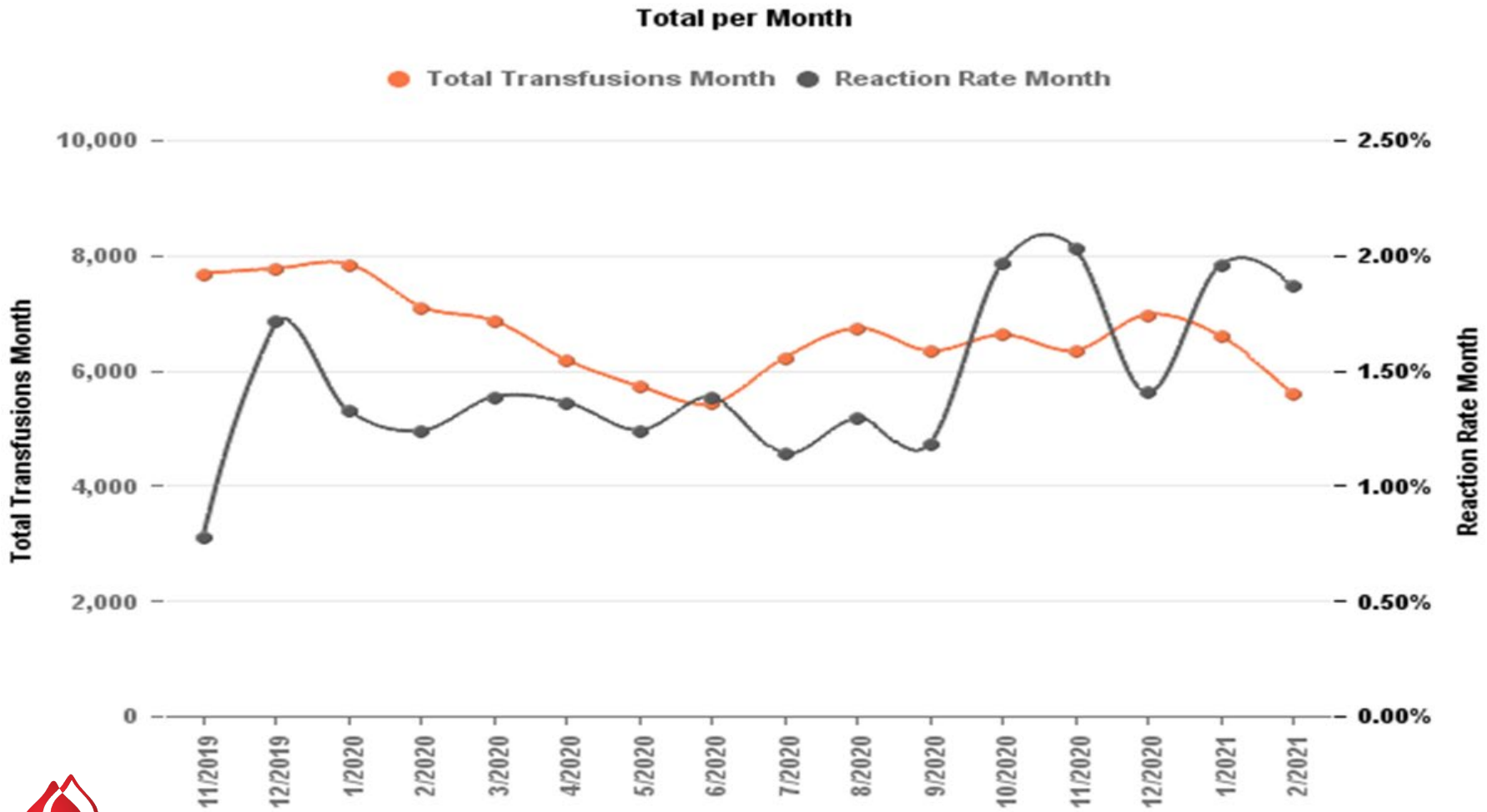

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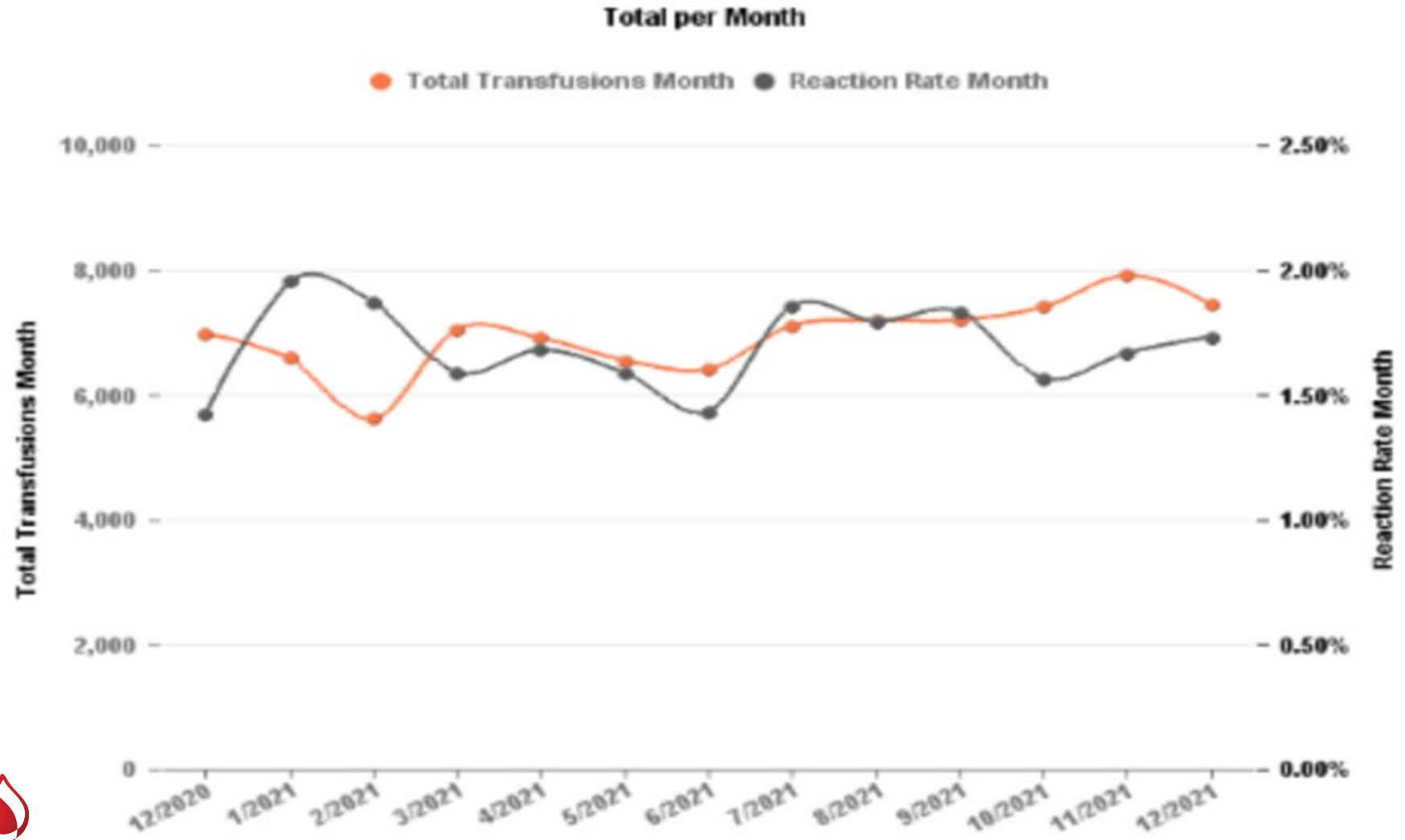

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Clasificación de Reacción Transfusional

	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021
Allergic reaction	12	12	23	27	28	29	27	32	27	24	35	30	22
Delayed hemolytic transfusion reation (DHTR)										1			
Febrile non-hemolytic transfusion reaction (FNHTR)	73	94	69	70	71	61	54	83	89	94	72	88	79
Hypotensive transfusion reaction			1			2		1	1			2	
Other (comment)							1				1		
Transfusion associated circulatory overload (TACO)	14	22	14	15	18	14	9	17	13	13	8	16	25
Transfusion associated dyspnea (TAD)		2		2	1		2	1	2	3	2		4
Number of Dx	99	130	107	114	118	106	93	134	132	135	118	134	130
Total Reactions (# of Notes)	**99**	**129**	**105**	**112**	**116**	**104**	**92**	**132**	**129**	**132**	**116**	**132**	**129**

	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021
Total Transfusions	6,971	6,592	5,614	7,048	6,904	6,552	6,414	7,113	7,189	7,199	7,410	7,914	7,444
Total Reactions (# of Notes)	99	129	105	112	116	104	92	132	129	132	116	132	129
Reaction Rate	1.42%	1.96%	1.87%	1.59%	1.68%	1.59%	1.43%	1.86%	1.79%	1.83%	1.57%	1.67%	1.73%

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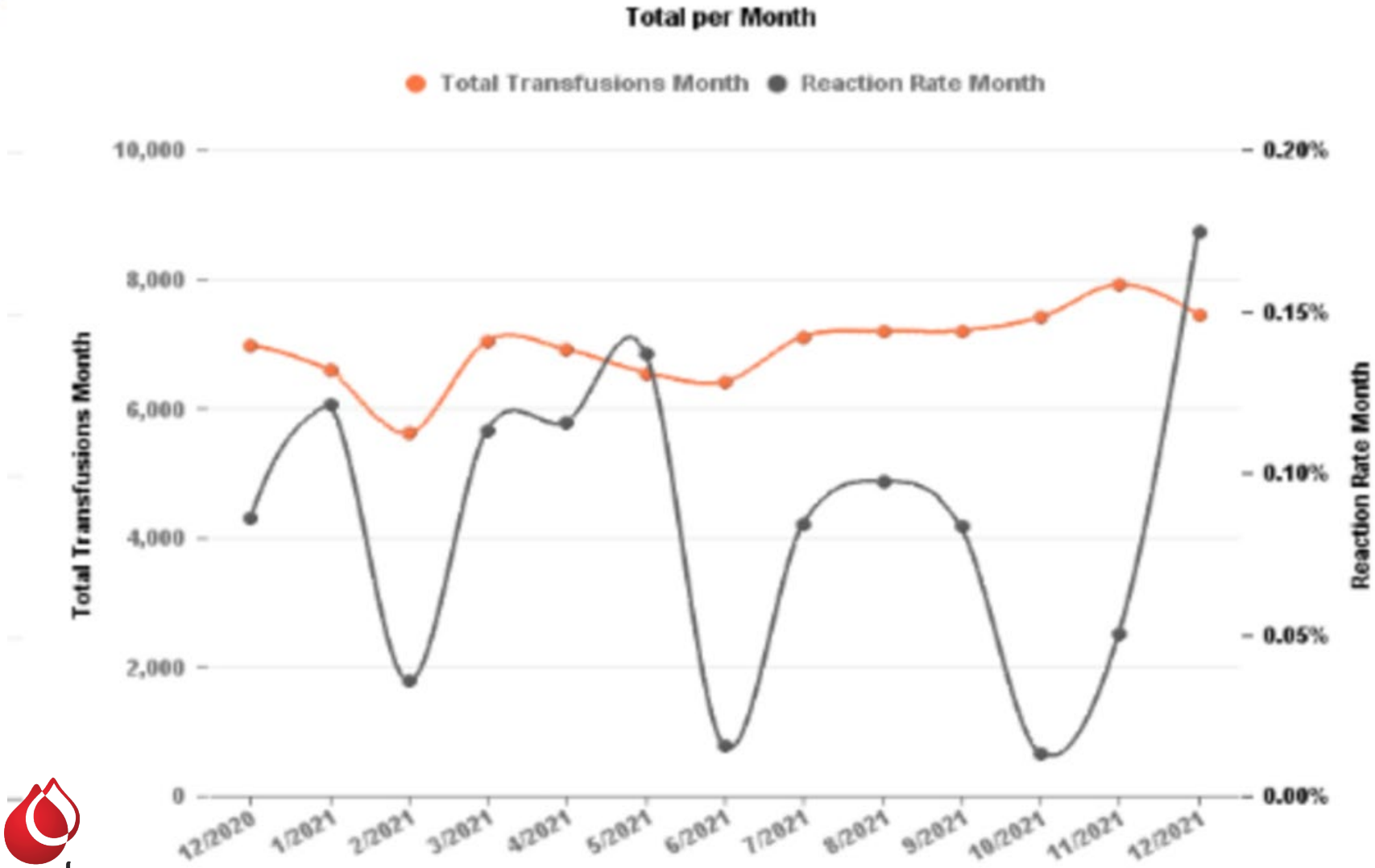
Perspectiva Histórica Reacciones severas



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Perspectiva Histórica Reacciones severas

	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021
Allergic reaction	2	1		1	1	1		1	2	2			3
Febrile non-hemolytic transfusion reaction (FNHTR)								1	2			1	1
Hypotensive transfusion reaction						1						1	
Other (comment)							1						
Transfusion associated circulatory overload (TACO)	4	6	2	6	7	7		4	4	4	1	2	9
Transfusion associated dyspnea (TAD)		1		1									
Number of Dx	6	8	2	8	8	9	1	6	8	6	1	4	13
Total Reactions (# of Notes)	**6**	**8**	**2**	**8**	**8**	**9**	**1**	**6**	**7**	**6**	**1**	**4**	**13**

	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021
Total Transfusions	6,971	6,582	5,614	7,048	6,904	6,552	6,414	7,113	7,189	7,199	7,410	7,914	7,444
Total Reactions (# of Notes)	6	8	2	8	8	9	1	6	7	6	1	4	13
Reaction Rate	0.09%	0.12%	0.04%	0.11%	0.12%	0.14%	0.02%	0.08%	0.10%	0.08%	0.01%	0.05%	0.17%

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Reacciones Transfusionales 2022

	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Acute hemolytic transfusion reaction (AHTR)		1										
Allergic reaction	18	19	16	26	32	35	29	22	27	13	29	17
Delayed hemolytic transfusion reation (DHTR)			1									
Delayed serologic transfusion reation (DSTR)						1			2	4	4	
Febrile non-hemolytic transfusion reaction (FNHTR)	81	83	87	86	75	66	91	77	79	83	83	79
Hypotensive transfusion reaction	3		1	1		1				1	1	1
Other (comment)		3		1	1			1	2	1		
Transfusion associated circulatory overload (TACO)	22	22	26	26	33	25	19	28	39	33	26	48
Transfusion associated dyspnea (TAD)				1	3	1	4		1	1	2	1
Transfusion related acute lung injury (TRALI)						1						
Transfusion transmitted infection (TTI)		1										
Number of Dx	124	129	131	141	144	130	143	128	150	136	145	146
Total Reactions (# of Notes)	**121**	**128**	**131**	**141**	**144**	**129**	**141**	**128**	**149**	**135**	**145**	**145**

	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Total Transfusions	6,766	6,711	7,580	7,166	7,311	6,962	7,085	7,437	7,302	7,265	6,996	7,484
Total Reactions (# of Notes)	121	128	131	141	144	129	141	128	149	135	145	145
Reaction Rate	1.79%	1.91%	1.73%	1.97%	1.97%	1.85%	1.99%	1.72%	2.04%	1.86%	2.07%	1.94%

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Reacciones Transfusionales Severas 2022

	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Allergic reaction		1	1	1	1	1	2		2	1	4	2
Febrile non-hemolytic transfusion reaction (FNHTR)						1						
Hypotensive transfusion reaction	1											
Other (comment)		2										
Transfusion associated circulatory overload (TACO)	6	1	12	2	2	3	2	3	3	4	1	4
Transfusion related acute lung injury (TRALI)						1						
Number of Dx	7	4	13	3	3	6	4	3	5	5	5	6
Total Reactions (# of Notes)	7	4	13	3	3	5	4	3	5	5	5	6

	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Total Transfusions	6,766	6,711	7,580	7,166	7,311	6,962	7,085	7,437	7,302	7,265	6,996	7,484
Total Reactions (# of Notes)	7	4	13	3	3	5	4	3	5	5	5	6
Reaction Rate	0.10%	0.06%	0.17%	0.04%	0.04%	0.07%	0.06%	0.04%	0.07%	0.07%	0.07%	0.08%

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Reacciones Transfusionales 2023

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	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023
Allergic reaction	27	13	29	17	20	35	12	18	20	23	20	25
Delayed hemolytic transfusion reation (DHTR)								1			1	
Delayed serologic transfusion reation (DSTR)	2	4	4		3		2	1	2	2		
Febrile non-hemolytic transfusion reaction (FNHTR)	79	83	83	79	86	60	79	67	71	74	125	84
Hypotensive transfusion reaction		1	1	1	1				1		1	1
Other (comment)	2	1			1			2			4	
Transfusion associated circulatory overload (TACO)	39	33	26	48	30	19	23	23	20	27	32	23
Transfusion associated dyspnea (TAD)	1	1	2	1	1				3	8	6	2
Number of Dx	150	136	145	146	142	114	116	112	117	134	189	135
Total Reactions (# of Notes)	149	135	145	145	140	111	116	111	117	132	189	134

	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023
Total Transfusions	7,302	7,265	6,996	7,494	7,229	6,615	7,406	6,858	7,218	7,528	7,701	7,767
Total Reactions (# of Notes)	149	135	145	145	140	111	116	111	117	132	189	134
Reaction Rate	2.04%	1.86%	2.07%	1.93%	1.94%	1.68%	1.57%	1.62%	1.62%	1.75%	2.45%	1.73%

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	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023
Allergic reaction	2	1	4	2	3					3		
Delayed hemolytic transfusion reation (DHTR)											1	
Febrile non-hemolytic transfusion reaction (FNHTR)					1					2		2
Other (comment)					1							
Transfusion associated circulatory overload (TACO)	3	4	1	4			4	2	1	2	8	1
Transfusion associated dyspnea (TAD)									2	1		
Number of Dx	5	5	5	6	5		4	2	3	8	9	3
Total Reactions (# of Notes)	5	5	5	6	4		4	2	3	7	9	3

	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023
Total Transfusions	7,302	7,265	6,996	7,494	7,229	6,615	7,406	6,858	7,218	7,528	7,701	7,767
Total Reactions (# of Notes)	5	5	5	6	4		4	2	3	7	9	3
Reaction Rate	0.07%	0.07%	0.07%	0.08%	0.06%		0.05%	0.03%	0.04%	0.09%	0.12%	0.04%

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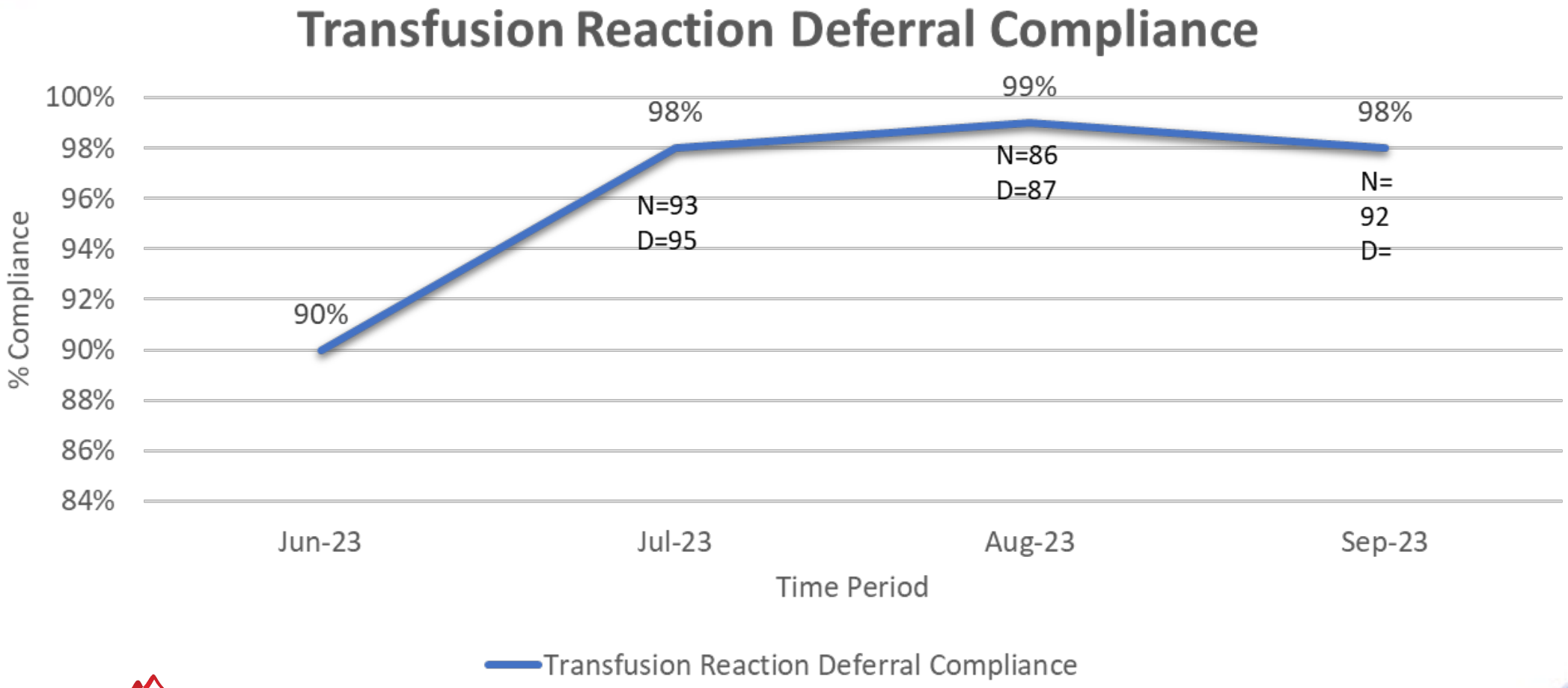
Cumplimiento de investigación



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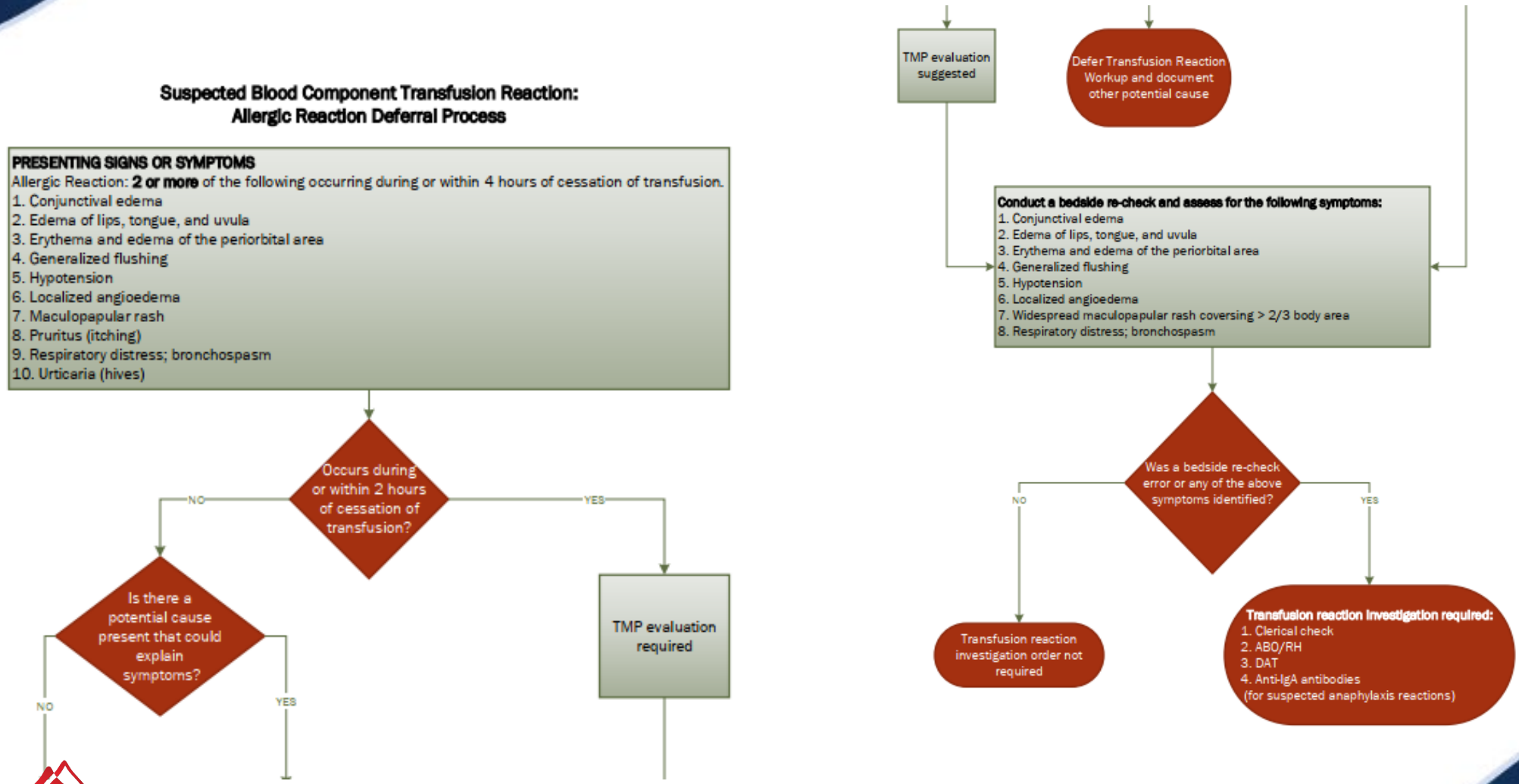
Suspected Blood Component Transfusion Reaction: Allergic Reaction Deferral Process



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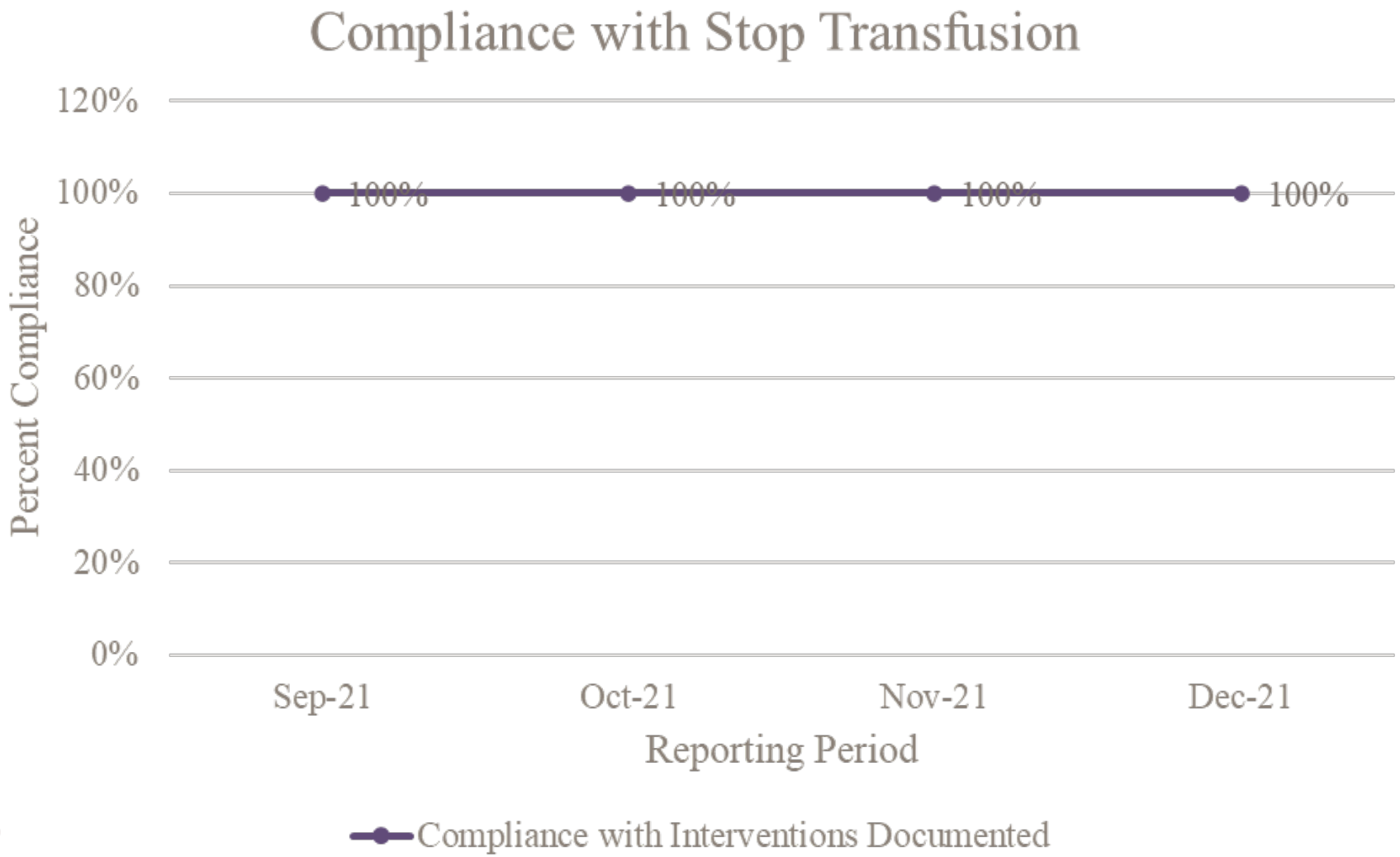
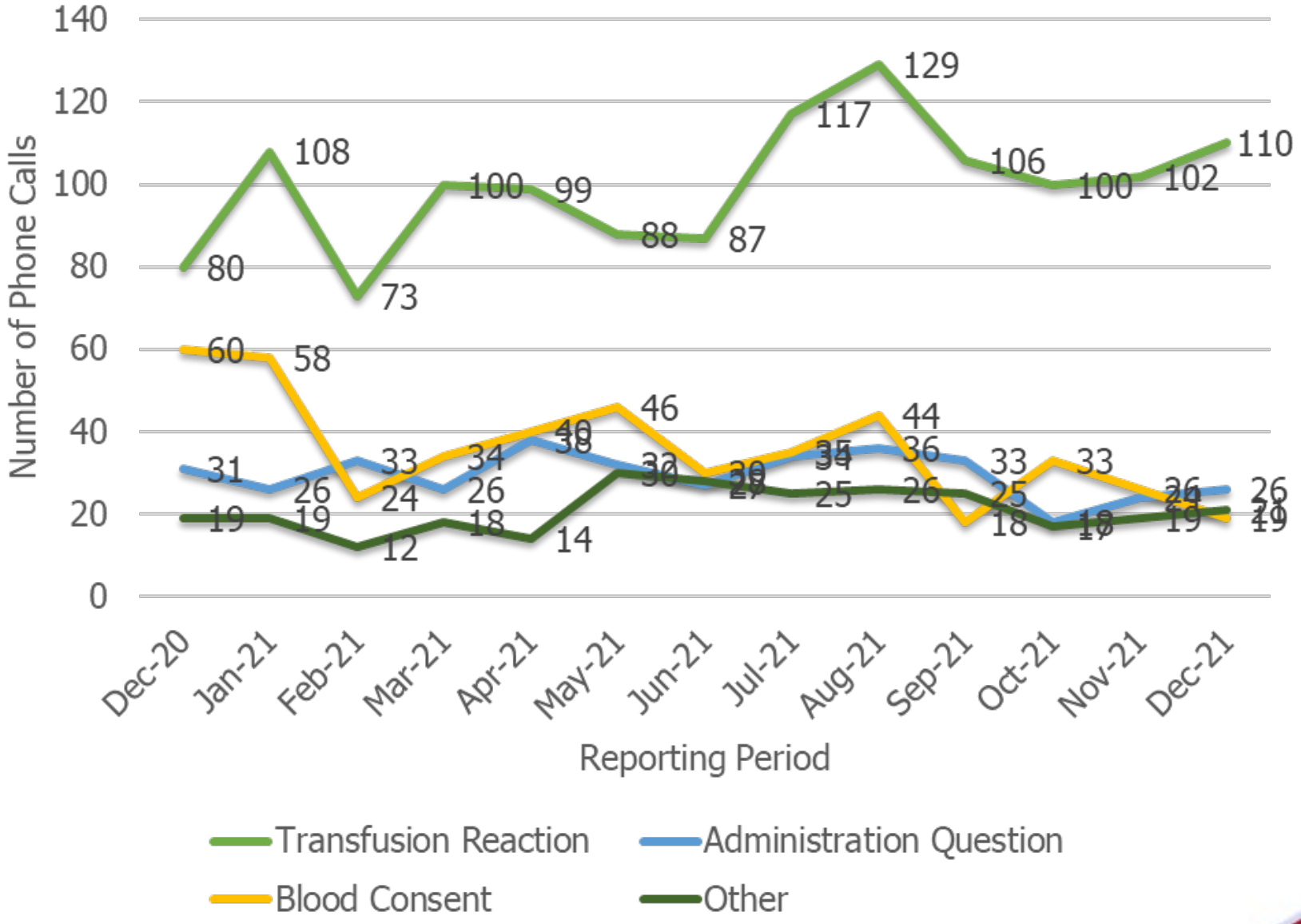
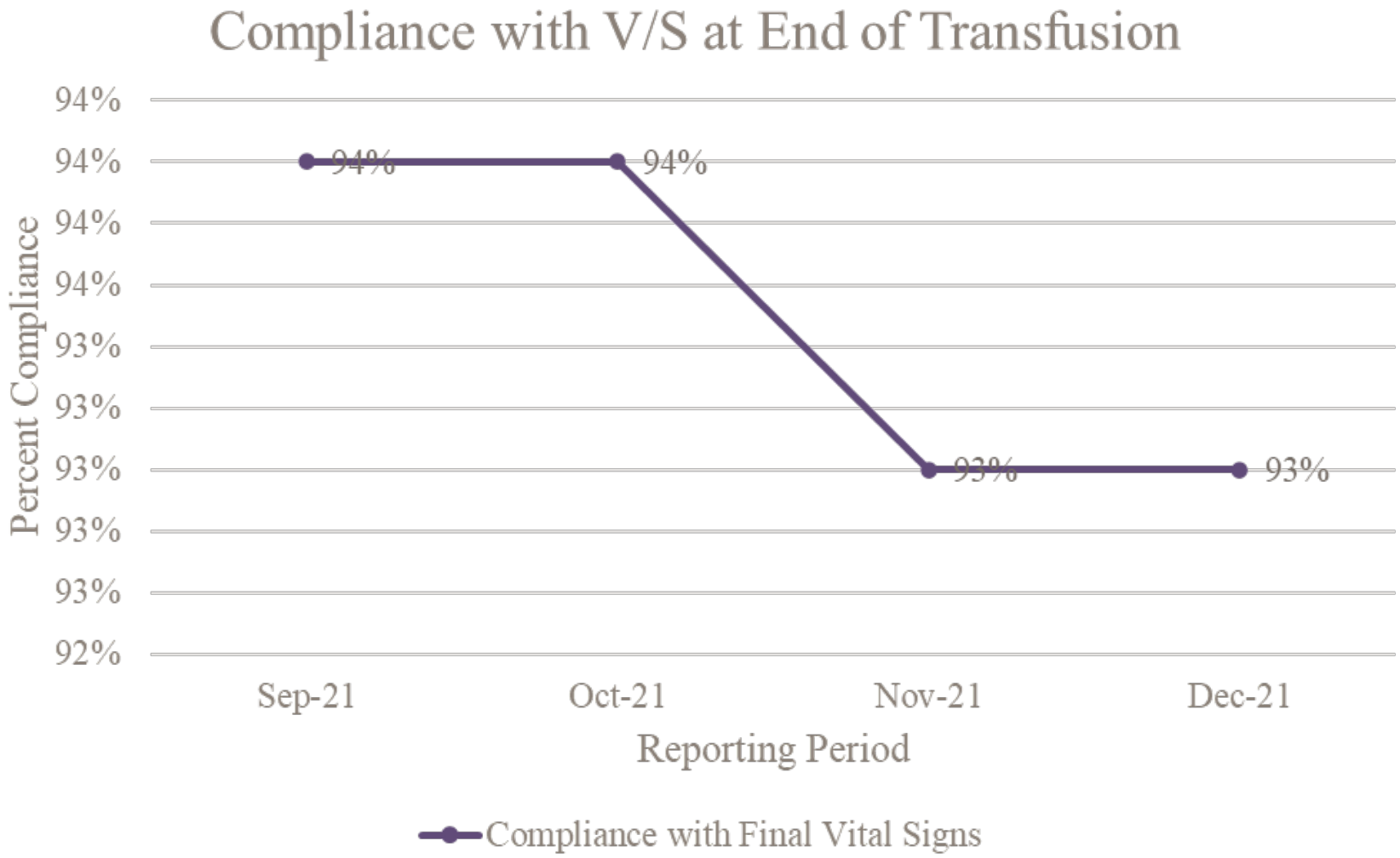
Cumplimiento de Parar Transfusion



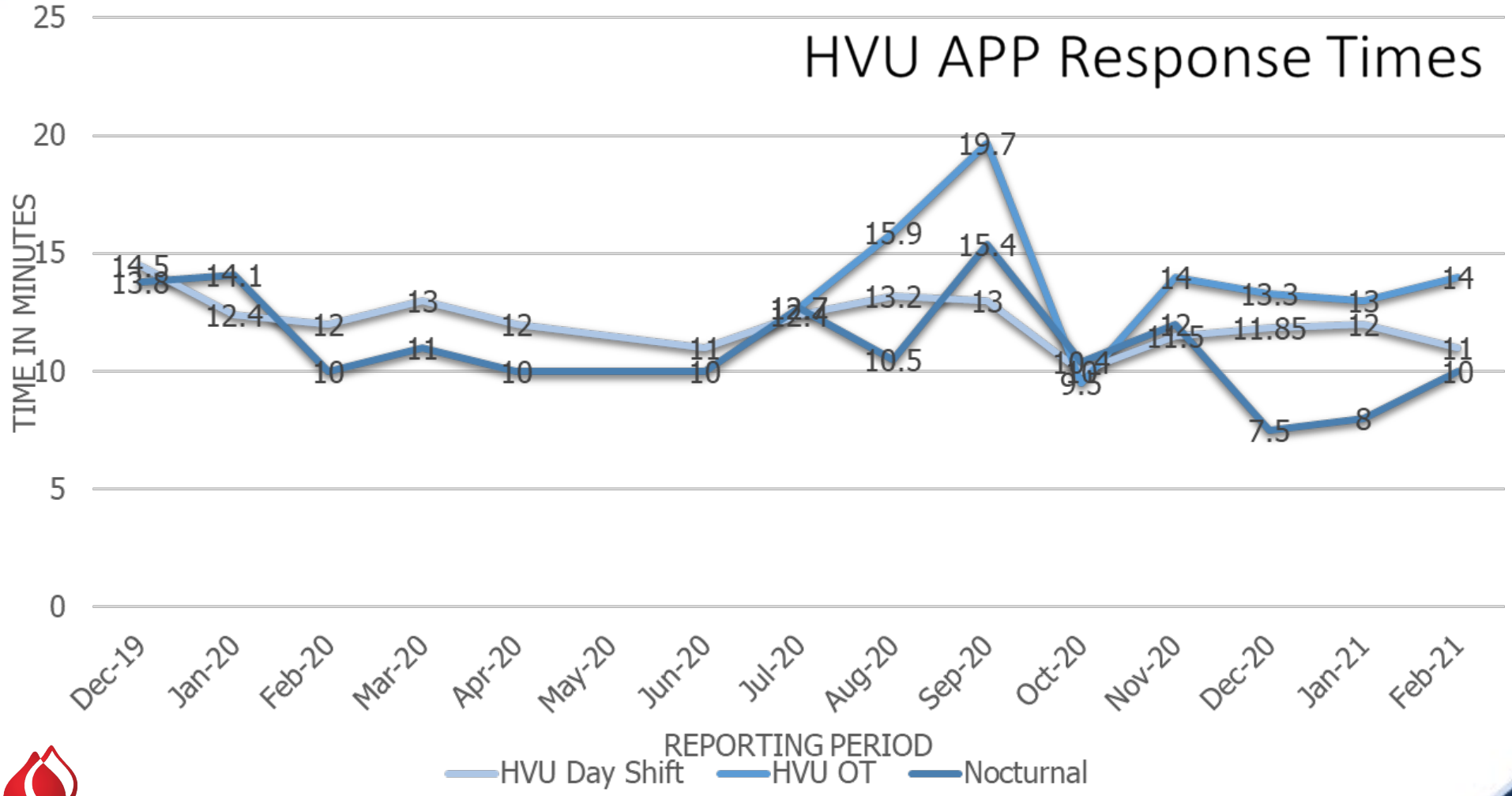
Llamadas a HVU



Cumplimiento de Toma de Signos Vitales



Tiempo de Respuesta de Personal de HVU



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Cumulative Transfusion Reaction Rate

Total Patients with HVU Note	Total Notes	Total Reactions	Total Transfusions
4,924	8,810	7,770	452.1K

Blood Usage Rates

COVID blood shortages nadir June 2020

Usage normalized November 2021

Reaction Rate: 0.67%- 2.55% (range)

Approximates 2%

Impacted seasonal variations

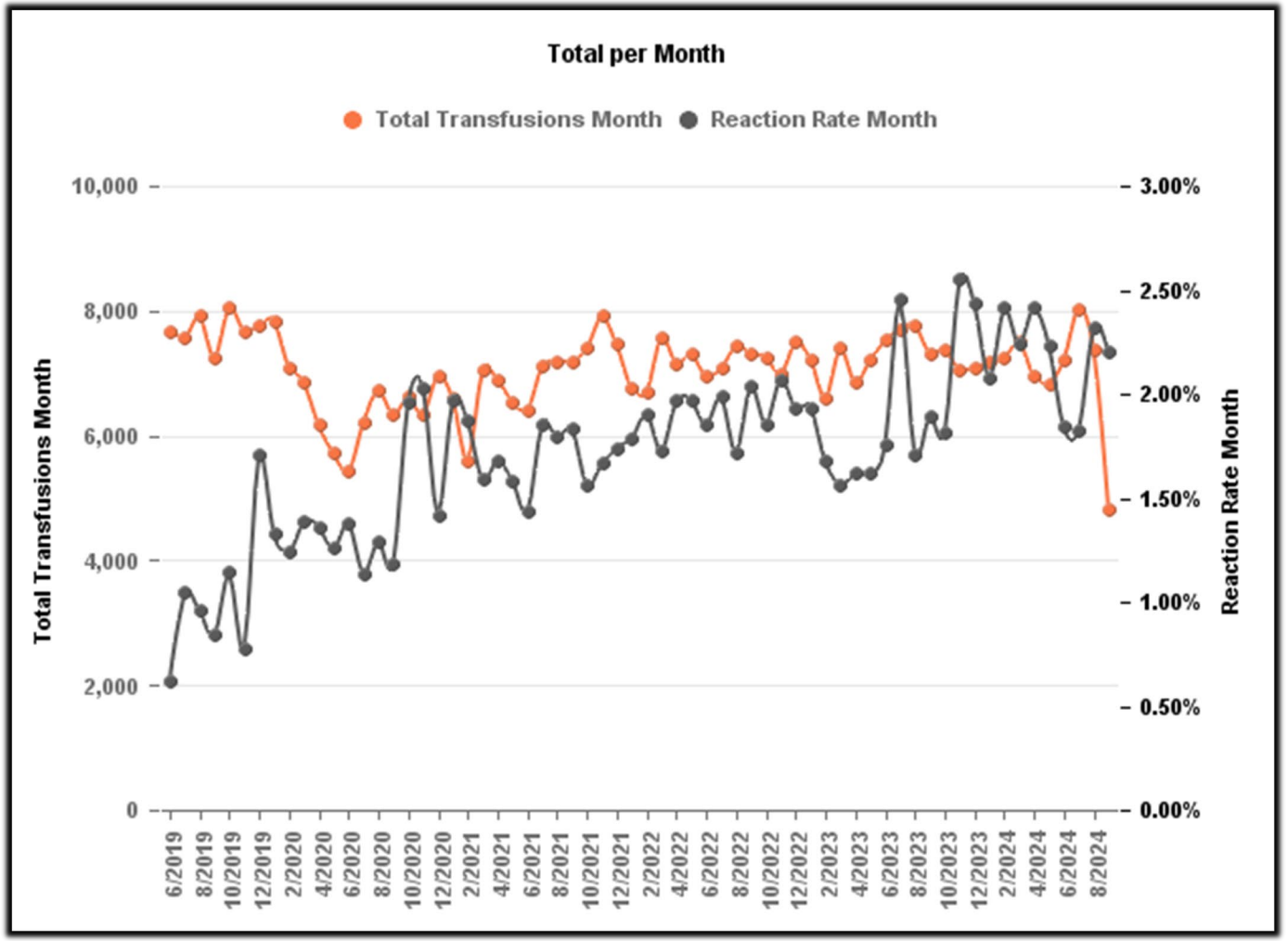
Dashboard alternations

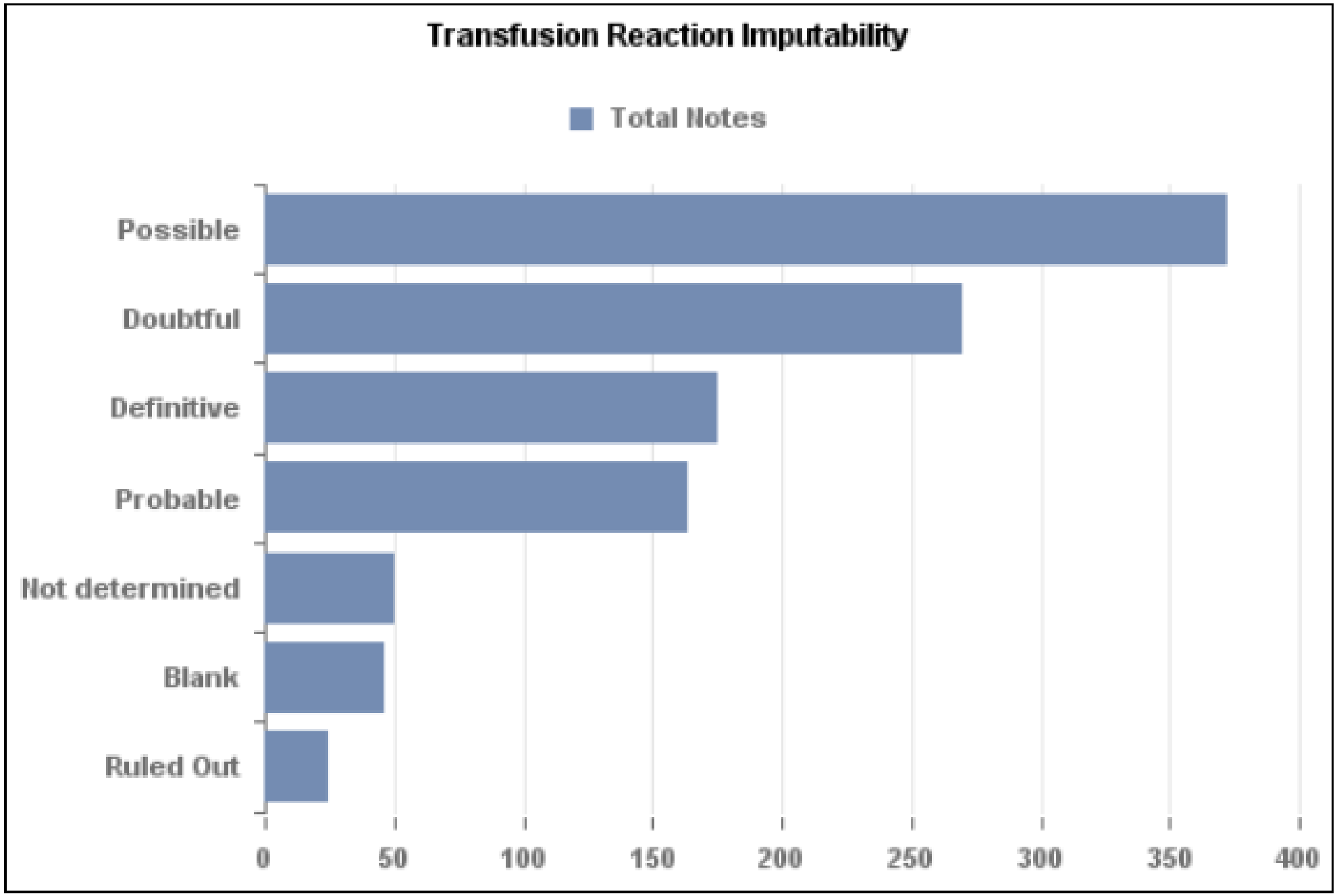
Diagnostic/operational changes

Increase in Pathologist Case Load

Increased detection

Increased volume of transfusions




Transfusion Reaction Imputability
Total Notes
Possible
Doubtful
Definitive
Probable
Not determined
Blank
Ruled Out
0
50
100
150
200
250
300
350
400

Sumario

- **En los 36 meses antes de la implementación de la unidad de hemovigilancia la rate de reacciones transfusionales era de 0.34%**
- **Las reacciones alérgicas leves eran las más comúnmente reportadas en forma pasiva; 58%, seguidas de reacciones febriles; 41.1% y TACO; 0.5%**

Sumario

- **La detección de reacciones transfusionales se incrementó marcadamente con la implementación de la unidad de hemovigilancia**
- **Se hace una revisión de cada Muerte cuando ha habido una transfusión en las 24 horas anteriores**

Sumario

- **La colaboración activa del banco de sangre con la contraparte clínica y enfermería ha resultado en un ambiente más Seguro para la transfusión de componentes sanguíneos**
- **Proveedores de salud con entrenamiento en reacciones transfusionales evaluaron el paciente 12-15 minutes después de detectada la reacción transfusional**

Sumario

- **La educación duplico el reporte pasivo de reacciones transfusionales**
- **Hay una comunicación muy fluida entre los clínicos, la unidad de hemovigilancia y el servicio de transfusión**

Sumario

- **La unidad de hemovigilancia mejora la seguridad del paciente, mejora cumplimiento de estándares y facilita transparencia**
- **Es una Plataforma de descubrimiento**

13° CONGRESO COLOMBIANO & 19° CONGRESO IBEROAMERICANO DE BANCOS DE SANGRE, MEDICINA TRANSFUSIONAL Y TERAPIA CELULAR

CONECTADOS CON EL PACIENTE

Octubre 31 a Noviembre 3 del 2024
Bogotá Colombia, Hotel Sheraton

Acobasmet
Asociación Colombiana de Bancos de Sangre y Medicina Transfusional