1. Committee Purpose and Responsibilities

1.1. The Pediatric Committee is responsible for promoting pediatric expertise through advocacy and education. The Pediatric Committee will serve as the resource for information regarding pediatric emergency preparedness and identify needs or trends in the management of injured and acutely ill children. The Pediatric Committee will also provide guidance in the development and review of hospital and pre-hospital assessment tools, regional plans and treatment guidelines, and the committee SOP. Additionally, the committee will provide interface with other NCTTRAC committees, professional associations appropriate to the service line, and the Governor's EMS and Trauma Advisory Council (GETAC).
1.2. Establish standards and procedures for the Pediatric Committee
1.3. Focus on pediatric education and advocacy for health care providers and community partners
1.4. Create broad stakeholder representation while working to provide an opportunity to share resources leading to the development, operation and evaluation of pediatric education and advocacy and within TSA - E
1.5. Guide decisions based on current trauma trends, data, assessment of programs, and educational and advocacy opportunities
1.6. Organize, support and coordinate health care evidenced based education identified through NCTTRAC regional data and/or needs assessments
1.7. Provide and support its members with pediatric expertise and identify pediatric education and advocacy opportunities as requested
1.8. Solicit members to include stakeholders such as urban/suburban and rural EMS providers, nurses, trauma coordinators, educators, businesses, and community groups

2. Sub-Committees and Work Groups

2.1. As deemed necessary

3. Committee Chair/Chair Elect Responsibilities

3.1. Chair
  3.1.1. The Committee Chair serves as the principal liaison between the committee and the Board of Directors with responsibilities that include, but are not limited, to:
    3.1.1.1. Knowledge of the Bylaws.
    3.1.1.2. Scheduling meetings.
    3.1.1.3. Meeting agenda and notes.
    3.1.1.4. Providing committee report to the Board of Directors.
    3.1.1.5. Annual review of Pediatric Plans, Guidelines, committee SOP, and SPI indicators.
    3.1.1.6. Provide or arrange for knowledge and dissemination of appropriate liaison group activities to committee members and the Board of Directors.
  3.1.2. The Chair must be a documented representative of a NCTTRAC member in good standing as defined in the NCTTRAC Membership and Participation SOP.
  3.1.3. The Chair will serve a one-year term of office, beginning at the start of the Fiscal year, and be succeeded by the Chair Elect at the end of the Fiscal Year.
3.2. Chair Elect
  3.2.1. The Committee Chair Elect assists the Chair with committee functions and assumes the Chair responsibilities for committee activity and meeting management in the

temporary absence of the Chair. The Chair Elect may serve in lieu of the Pediatric Committee Chair for Board of Directors responsibilities.

3.2.2. The Chair Elect must be a documented representative of a NCTTRAC member in good standing as defined in the NCTTRAC Membership and Participation SOP.

3.2.3. The Chair Elect automatically ascends to the Chair position at the end of the current Chair's term or if the Chair position is otherwise vacated.

3.2.4. In the event the Chair is unable to fulfill the term, the Chair Elect shall ascend to Chair in accordance with the NCTTRAC Bylaws

3.2.5. The Chair Elect position will be voted on by the Pediatric Committee annually or when the incumbent has vacated this position.

4. Committee Medical Director

4.1. The Pediatric Committee Medical Director/Co-Medical Director is responsible for

4.1.1. Participating directly with their service line committee

4.1.2. Establishing and maintaining a standing coordination method with their service line peers

4.1.3. Maintaining availability for coordinating with other committees' Medical Directors to recommend a minimum standard of care for providers participating in the trauma, acute, emergency healthcare and disaster response systems of TSA-E

4.2. The Pediatric Committee Medical Director/Co-Medical Director provides current physician insight and involvement in support of the Pediatric and its responsibilities, including:

4.2.1. Identifying and assessing regional performance improvement standards, formulating strategies, and making recommendations to the committee to ensure that the best possible standards of healthcare can be met within TSA-E.

4.2.2. Active partnership in the coordination and support of the following service line committee products

4.2.2.1. Service Line Regional Plans

4.2.2.2. Guidelines

4.2.2.3. Texas Department of State Health Services (DSHS) Rules Reviews

4.3. The Pediatric Committee Medical Director/Co-Medical Director must be a documented representative of a NCTTRAC member in good standing as defined in the NCTTRAC Membership and Participation SOP.

4.4. The Pediatric Committee Medical Director/Co-Medical Director position will be voted on by the Pediatric Committee annually, with each Fiscal Year, or if otherwise vacated.

4.5. The Pediatric Committee Medical Director/Co-Medical Director should be prepared, with NCTTRAC staff assistance, to facilitate a peer group of Pediatric medical directors (by email or meeting) in support of Pediatric Committee efforts as appropriate.

4.6. The Pediatric Committee Medical Director/CO-Medical Director will be seated as a voting representative on the NCTTRAC Medical Directors Committee.

4.7. The Pediatric Committee will establish a Co-Medical Director position, who meets the same criteria above, to assist as desired.

5. Committee Representation

5.1. In accordance with NCTTRAC Bylaws Article IX, there is not a voting core group identified within the Pediatric Committee. The absence of an identified core group opens voting rights at the committee level to all NCTTRAC Members in good standing.

5.2. The Pediatric Committee Leadership Group (Chair, Chair Elect, and Co-Medical Directors) may convene on an ad hoc basis to represent the committee in matters necessary to

maintain contractual compliance, execute deliverables, and/or endorse emergency, off-cycle purchases for regional benefit. Actions taken will be reported at the next scheduled committee meeting.

6. Committee Attendance

6.1. While attendance is highly encouraged in support of meaningful participation, there are no specific attendance requirements at committee level.

7. Quorum & Voting

7.1. Standing Committees/Subcommittees voting may be conducted by the following methods, unless otherwise addressed in the committee/subcommittee SOP:
- 7.1.1. In person or virtually during the meeting.
- 7.1.2. Electronically (e.g., email, fax, website) for unscheduled votes between meetings.
- 7.1.3. Votes may be cast by proxy in accordance with NCTTRAC Bylaws Article XIV.
- 7.1.4. The outcome of each action item will be recorded in the meeting minutes or notes.

7.2. As an alternative to a consensus vote at a Pediatric Committee Meeting, electronic votes may be employed. A record of responses and results must be maintained in the Meeting Notes or Minutes.
- 7.2.1. Electronic Votes may be called via:
  - 7.2.1.1. Polls
  - 7.2.1.2. Surveys
  - 7.2.1.3. Ballots
  - 7.2.1.4. Other technologies

7.3. The Chair may only vote in the event of a tie; however, the Chair's organization may assign an appropriately documented voting delegate to fill their committee core group position during the Chair's term.

8. Committee Liaisons (identify active state and local service line and coalition relations, examples below)

8.1. Governor's EMS and Trauma Advisory Council (GETAC) Pediatric Committee
8.2. Texas Trauma Coordinators Forum (TTCF)
8.3. Texas EMS Association (TEMSA)
8.4. Texas Emergency Nurses Association
8.5. Dallas Fort Worth Hospital Council Foundation (DFWHC)

9. Standing Committee Obligations

9.1. Annual Review of the Committee SOP
9.2. Annual Review of Regional Plans & Guidelines
9.3. DSHS "Essential Criteria", Rules and/or contractual deliverables, as applicable
9.4. GETAC Strategic Plan objectives and strategies, as applicable

10. Projected Committee Goals, Objectives, Strategies, Projects

10.1. Promote collaboration and commitment among all health care providers (EMS, hospital, NCTTRAC members) who care for pediatric patients

10.2. Collaborate with other NCTTRAC Committees to provide one public education and/or continuing education opportunity per year that is focused on enhancing care provided to the pediatric population
10.3. Serve as a resource for pediatric best care practice dissemination and collaboration in TSA-E
10.4. Achieve 70% participation in the National Pediatric Readiness Quality Initiative for facilities within TSA-E
10.5. Achieve 70% participation in the Prehospital Pediatric Readiness Assessment for EMS Agencies in TSA-E
10.6. NCTTRAC's "Accountability Scorecard" spreadsheet will be used to document commitments and progress with associated efforts

11. System Performance Improvement (SPI)

11.1. The Pediatric Committee will support Pediatric SPI responsibility by establishing a standing meeting agenda item and corresponding accountability (e.g., appoint individual facilitator, workgroup, or sub-committee).
11.2. At minimum, the Committee will review, evaluate, and report Pediatric EMResource utilization and make recommendations to the Executive Committee of the Board of Directors for appropriate designation/accreditation of hospitals related to initial or changes to designation/accreditation as requested/required by the Department of State Health Services (DSHS).
11.3. Prior to submitting an SPI event, the referring/requesting agency is expected to first contact the involved agencies/facilities in an attempt to satisfactorily resolve the issue or concern. Only after appropriate attempts have been made to satisfactorily resolve an SPI event should the referring/requesting agency formally submit an SPI event notification/request via the NCTTRAC secured ticket system.
11.4. Closed Pediatric SPI meetings support detailed reviews of Performance Improvement (PI) Indicators and referred PI events as afforded by Texas Statute and Rule.
    11.4.1. Representation:
        11.4.1.1. Pediatric Committee Chair
        11.4.1.2. Pediatric Committee Chair Elect
        11.4.1.3. Pediatric Committee Medical Director
        11.4.1.4. Two volunteer Pediatric Committee representatives, (as needed)
    11.4.2. Closed Pediatric SPI meeting participants will sign a confidentiality statement prior to the start of each closed meeting.
    11.4.3. Meeting notes, attendance rosters, and supporting documents of Closed SPI meetings must be provided to NCTTRAC staff within 48 hours following each meeting to be secured as a confidential record of committee activities.
11.5. SPI Products
    11.5.1. Pediatric SPI Indicators
    11.5.2. Pediatric SPI Referral Form
11.6. SPI Indicators
    11.6.1. Utilize DFW Hospital Council Foundation and third party (ASN) statistical data to facilitate quality, performance, and injury prevention initiatives to create an SPI dashboard
    11.6.2. Pediatric hospitals will accept the pediatric trauma transfer patient within 30 minutes of request when they have the resources and capacity to do so.

11.6.3. All hospitals will transfer pediatric trauma patients within two hours of arrival OR within two hours of identifying an injury that requires transfer to a higher level of care. Pediatric trauma patients will only be transferred one time to the most appropriate facility.
11.6.4. In-patient pediatric trauma transfers will be reviewed upon request through the NCTTRAC Systems Performance Improvement process.
11.6.5. Pediatric trauma patients in need of ICU care will be transferred to a tertiary care center with pediatric ICU capability within one hour of identifying the need for transfer.
11.6.6. Pediatric trained transport teams should be available within 30 minutes of request when possible.
11.6.7. Receiving hospitals will provide transferring facilities with preliminary feedback of the pediatric transfer within 30 days upon receiving the request and a formal letter upon patient discharge. When a receiving hospital's feedback letter requests follow up on a care or timeliness issue, the transferring hospital should respond within 30 days of receiving the letter.
11.6.8. All pediatric transfers occurring within TSA-E will be initiated and remain in TSA-E as the capacity of the tertiary care facilities allow and the patient's condition dictates.
11.6.9. Pediatric hospitals will submit statistical data and trauma registry data at minimum on a quarterly basis

12. Injury and Illness Prevention / Public Education

12.1. The Pediatric Committee will support Pediatric Injury/Illness Prevention and Public Education responsibility by establishing a standing meeting agenda item and corresponding accountability (e.g., appoint individual facilitator, workgroup, or sub-committee).
12.2. Focus on injury prevention and education of the public health needs.
12.3. Create a broad stakeholder representation working to provide an opportunity to share resources leading to the development, operation, and evaluation of public education and injury/illness prevention efforts within Trauma Service Area (TSA)-E.
12.4. Base decisions on current Pediatric trends and data, facts and assessment of programs and presented educational opportunities.
12.5. Organize, support and/or coordinate community evidenced based education and injury/illness prevention programs.
12.6. Recommend/support prevention priorities for TSA-E according to the injury/illness, geographic location, cost, and outcome.
12.7. Serve as a resource to identify prevention programs, events, and other prevention resources available in TSA-E to members and community members.
12.8. Establish Ad Hoc Task Forces, as necessary, to address specific issues.

13. Professional Development

13.1. The Pediatric Committee will support Pediatric Professional Development responsibility for all levels of providers by establishing a standing meeting agenda item and

corresponding accountability (e.g., appoint individual facilitator, workgroup, or sub-committee).

13.2. At minimum, the Pediatric Committee will:

13.2.1. Participate in the development of the Annual NCTTRAC Needs Assessment.

13.2.2. Sponsor educational events based on needs assessment results and potential committee request within annual budgetary limits.

14. Unobligated Budget Requests

14.1. Recommendations from the Pediatric Committee, coordinated through the Finance Committee, seeking approval from the Board of Directors for financial backing and execution authority in support of related initiatives, projects, and/or education efforts within TSA-E.

Appendix A – Pediatric Blood Resource Document

Attachment 1 Appendix A – Pediatric Blood Resource Document

Pediatric Hemorrhage/Massive Transfusion of Blood Products Administration Guideline

Indications	Signs and symptoms	Indication PEARLS
History of significant blood loss Penetrating trauma Blunt injury to abdomen Pelvic instability Long bone fractures Traumatic brain injury (TBI)	Hypotension/tachycardia: age appropriate Tachypnea: age appropriate Restlessness; confusion Weakness, dizziness Pale, cool, clammy skin (can be limited to extremities)	• Pediatric patients can maintain normal hemodynamics for **up to 20%** of their blood loss before showing a decrease in SBP. • **Tachycardia** is an early indicator of shock in the pediatric patient. • **Hypotension** in the pediatric patient can be a *late sign and ominous* sign of prearrest.

Special Considerations for Administration:	Blood Product Administration PEARLS
1. **Pediatric Equipment Availability:** ○ **IV/IO catheters, IV tubing, Rapid/Warm infusers** 2. **Size of child AND rate of blood loss** 3. **Do NOT delay treatment if patient meets criteria for administration** 4. **Consult with local Pediatric Centers for guidance as *early as possible*: Call EARLY, Call NOW, Call FAST!** 5. **Neonate population: < 3 months or < 3-5 kg early consultation, frequent reassessments recommended**	• **PRBCs and FFP should be given via WARM infuser with rapid infusion capability, when available.** • Two vascular sites should be obtained - Blood product administration requires a dedicated site. • Avoid mixing LR and PRBC in the same IV/blood tubing line or using as dilutant, when possible. • Consider all possible causes of shock and treat as appropriate. • **LAB VALUES** to continually monitor: ionized calcium, PT/INR, hemoglobin, FIB, Platelet, Base Deficit

Stable Blood Loss
- External hemorrhage: Control with tourniquet, hemostatic gauze, pressure dressing
- Obtain venous access, weigh patient in kg or use length based resuscitation tape
- Lactated Ringers 10mL/kg
- Closely monitor vitals, temperature, **keep patient warm**, check lab values

Tachycardic Blood Loss
- Administer Warmed PRBC 10mL/kg
- Warmed FFP or liquid plasma 10mL/kg
- Continually monitor lab values: ionized calcium, potassium, PT/INR, hemoglobin, FIB, Platelet count, Base Deficit (VBG/ABG)
- Internal hemorrhage: Consider Pelvic binder

Hypotensive Blood Loss
- Hypotension identification, age appropriate: 4-6 year old SBP < 90, 7-16 year old SBP < 100
- Administer Warmed PRBC 20 mL/kg, Maximum of 40 mL/kg, need for definitive surgical control of blood loss
- Warmed FFP or liquid plasma 20 mL/kg
- *Consider* TXA, initiate within 3 hours of injury, 15 mg/kg IV over 10 min (*Max 1 gram),* infusion of 2mg/kg/hr x 8 hours or until bleeding stops

SCAN HERE: References, equipment, and more information.

Children's Medical Center Dallas
888.730.3627
Cook Children's Medical Center Fort Worth
682.885.3901
Medical City Children's Dallas
1.800.SICK.KID

Age/Kilograms 1:1:1 Ratios PRBC: FFP: Platelets	PRBC **1 unit approximately 360 mL* DOSE: 10-20 mL/kg	FFP/Liq. Plasma 10-20 mL/kg	Platelets 5-10 mL/kg	Cryo
< 3 months (3-5 kg) GREY	30-50 mL (~12 doses/unit*)	**Same** as PRBC dose	1 unit pooled/10kg **OR** **Half** PRBC dose apheresis	**Request** Medical Direction
3-5 months (6-7 kg) PINK	60-70 mL (~6 doses/unit*)			
6-11 months (8-9 kg) RED	80-90 mL (~4 doses/unit*)			
12-24 months (10-11 kg) PURPLE	100-110 mL (~3 doses/unit*)			
2-year-old (12-14 kg) YELLOW	120-140 mL (~3 doses/unit*)			
3–4-year-old (15 kg-18 kg) WHITE	150-180 mL (~2 doses/unit*)			
5–6-year-old (19-23 kg) BLUE	190-230 mL (~2 doses/unit*)			
7–9-year-old (24-29 kg) ORANGE	240-290 mL (~1.5 doses/unit*)			
10–11-year-old (30-36 kg) GREEN	300-360 mL (~1 unit*)			
> 40 kg (10-20mL/kg)	400-800 mL (1-4 units*)	1-4 units	1 pack	10 units

Reference: 2019 Broselow – Luten zones, Broselow ® Pediatric Emergency Reference Tape

From a survey conducted assessing the practices of Trauma Service Area (TSA) E, 15 agencies and hospitals responded to the North Central Texas Trauma Regional Advisory Council (NCTTRAC) Pediatric Massive Transfusion Survey, 2020. Outside of using pressure bags on blood tubing, push-pull stopcock method or an approved blood tubing IV pump, the following devices are used regionally and the addition of emerging products to assist with warmed blood product administration for the bleeding pediatric patient. NCTTRAC and the pediatric committee does not endorse any medical product below, this is simply a compilation of the devices used in our region. Significant differences in performance can be found from device to device, clinicians should be aware of each device's limitations to match procurement to the planned clinical use.

Device Name	Manufacturer	Additional Information
Level 1® H-1200 Fast Flow Fluid Warmer or Level 1® HOTLINE® Blood and Fluid Warmer	ICU MEDICAL	https://www.smiths-medical.com/en-us/brands/level-1
Belmont® Rapid Infuser buddy lite™	Belmont Medical Technologies	https://belmontmedtech.com/rapid-infusion-pump
3M™ Ranger™ Blood/Fluid Warming Unit	3M™	https://multimedia.3m.com/mws/media/1099581O/ranger-fluid-warming-systems-brochure.pdf up to 500 mL/min
HypoThermX® HX100 and LG IV Blood and Fluid warming systems	EMIT™ Corporation	http://www.emitcorp.com/products.html 50-200 mL/min
Thermal Angel® Blood and IV Fluid Infusion Warmer	Estill Medical Technologies	https://thermalangel.com/products/comparison/
LifeFlow® Fluid Infuser and LifeFlow® PLUS Blood & Fluid Infuser	410 Medical ™	https://410medical.com/applications/pediatric/
QinFLOW The Warrior Modular System Blood and Fluid Warmer	QinFLOW	https://www.qinflow.com/effectively-warming-blood-iv-fluids-transfused-through-rapid-intermittent-bolus-flow-methods/
Quantum™ Blood & Fluid Warming System	LIFEWARMER™	https://www.lifewarmer.com/products/

Broselow®-Luten Zones

It is *always preferable* to measure the patient using a Broselow® Pediatric Emergency Reference Tape to determine the color zone.

For situations in which the child cannot be measured, patient age may be used to select the zone.

Zone	Patient weight	Age
3 kg, 4 kg, and 5 kg zones	3 kg, 4 kg, and 5 kg	< 3 mos
Pink	6–7 kg	3–5 mos
Red	8–9 kg	6–11 mos
Purple	10–11 kg	12–24 mos
Yellow	12–14 kg	2 yrs
White	15–18 kg	3–4 yrs
Blue	19–23 kg	5–6 yrs
Orange	24–29 kg	7–9 yrs
Green	30–36 kg	10–11 yrs

PEDIATRIC VITAL SIGNS Age/weight/ZONE 1:1:1 Ratios PRBC: FFP: Platelets	**Systolic Blood Pressure**	**Heart Rate (BPM)**	**PRBC DOSE: 10-20 mL/kg**	**FFP/Plasma 10-20 mL/kg**	**Platelets 5-10 mL/kg**	**Cryo**
< 3 months (3-5 kg) GREY	> 60 mmHg	100-180	30-50 mL	**Same** as PRBC dose	1 unit pooled/10kg **OR** **Half** PRBC dose apheresis	**Request** Medical Direction
3-5 months (6-7 kg) PINK	> 70 mmHg	100-180	60-70 mL			
6-11 months (8-9 kg) RED	> 70 mmHg	100-180	80-90 mL			
12-24 months (10-11 kg) PURPLE	> 75 mmHg	80-150	100-110 mL			
2-year-old (12-14 kg) YELLOW	> 75 mmHg	80-150	120-140 mL			
3–4-year-old (15 kg-18 kg) WHITE	> 75 mmHg	80-140	150-180 mL			
5–6-year-old (19-23 kg) BLUE	> 80 mmHg	70-120	190-230 mL			
7–9-year-old (24-29 kg) ORANGE	> 85 mmHg	70-120	240-290 mL			
10–11-year-old (30-36 kg) GREEN	> 90 mmHg	60-100	300-360 mL			
> 40 kg (10-20mL/kg)	> 100 mmHg	60-100	400-800 mL	1-4 units	1 pack	10 units

Though rapid delivery of fluid or blood products is commonly recommended for the urgent reversal of shock, little attention has traditionally been paid to HOW rapid infusion should be accomplished, and no consensus opinion exists on the optimal volume or rate of infusion. (Piehl-Park et al, 2021)

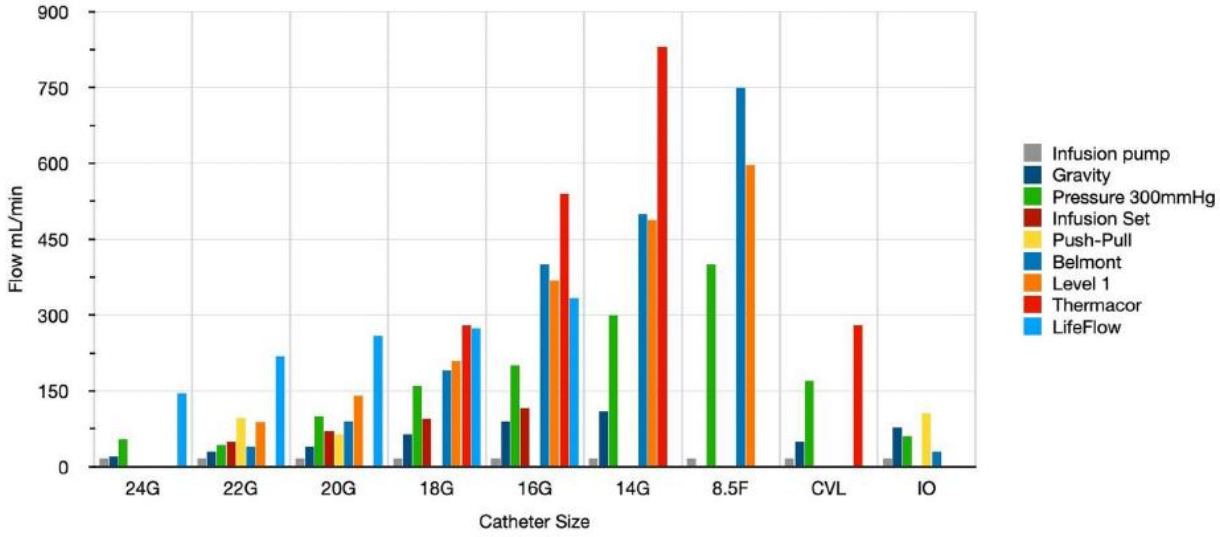

Fig. 3 Pressure-flow relationship of various vascular access devices [48, 53, 67–60]

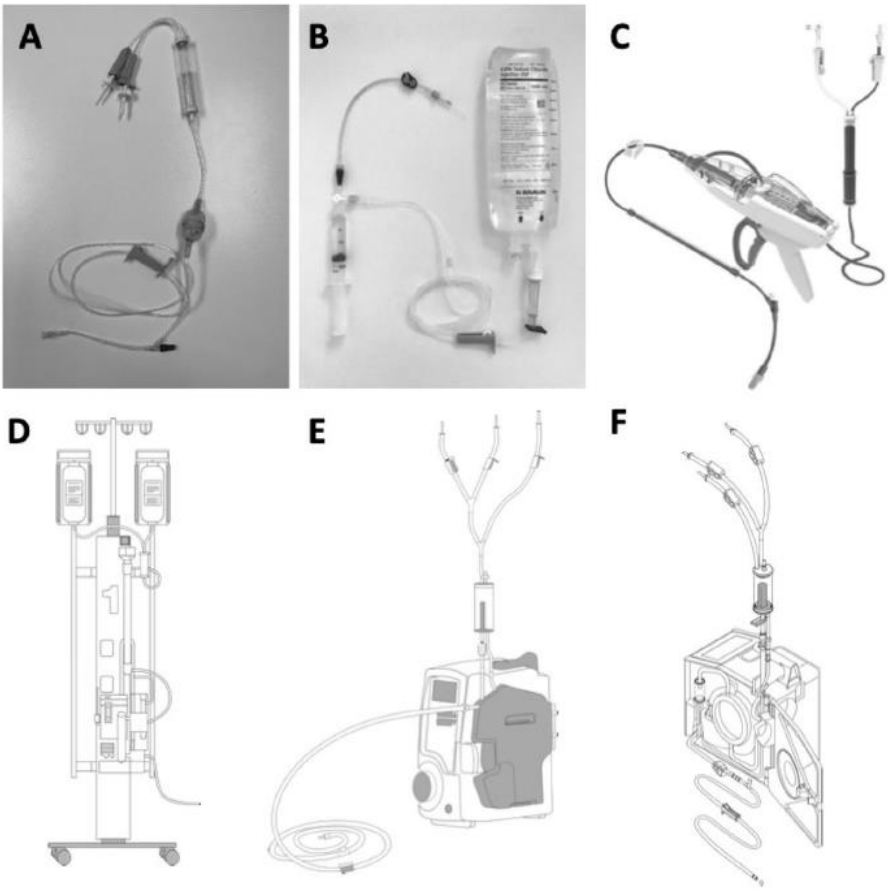

Fig. 4 Rapid infusion devices: **A** Hospira® Blood Infusion Set; **B** "push–pull" syringe and stopcock set; **C** LifeFlow®; and powered rapid infusers with warming capacity: **D** Smiths Medical Level 1® H-1200; **E** Smisson-Cartledge Biomedical ThermaCor® 1200; **F** the Belmont® Rapid Infuser RI-2. (Adapted from Belmont Medical Technologies, Smiths Medical, and Smisson-Cartledge product information brochures. LifeFlow image courtesy of 410 Medical.)

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Alameda County Medical Center- Massive Transfusion Protocol

Stanford Hospital & Clinics Massive Transfusion Guideline

Contributors: NCTTRAC Pediatric Committee Massive Transfusion Taskforce Members: Colyn Turnbow, Cheryl Malone, Dr. Daniel Guzman, Dr. Lori Pandya, Jeff Donson, Christopher Varnum, I. Curnow, Corrine Cooper, and support from the NCTTRAC administrative staff.