APHERESIS DONATIONS
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Background

Apheresis technology can be used to selectively collect platelets, RBC or plasma, and any combination of all three concurrently from donors.

**Instrument**: Trima Accel used at UCLA has the following donor-friendly features:
- Single needle access – blood is intermittently drawn but continuously processed
- Low extracorporeal volume and RBC loss (<100ml): improved donor safety and also allows platelet or plasma donation 2 days after (rather than 8 weeks) of WB donation
- Allows single or multi-component collection

Apheresis platelet donation
- Most common product collected by apheresis.
- Compared to WB derived platelets (platelet concentrates)
  o Higher number of plt per unit = each unit is equivalent to 6 plt concentrates and constitutes one therapeutic dose for most adults, should raise platelet count by 30-50k in non-refractory patients
  o If donor is of adequate body size and plt count is high enough, 2 (double) or 3 (triple) units can be collected in one procedure
  o Allows collection of adequate numbers of platelets from a single donor, e.g. directed donor, HLA-matched donor.
  o For the recipient: decreased donor exposure, decreased risks of transfusion-transmitted diseases
  o Relative ease of detecting bacterial contamination:
- Apheresis platelets: 15 ml sample removed for detection by automated instrument (BacT Alert).
- Whole blood derived concentrates: Most places perform a dipstick to detect pH and glucose changes, which are not sensitive or specific for bacterial detection.
  - Leukoreduction accomplished during collection, no additional processing needed.

*Note: UCLA platelet inventory is 100% apheresis platelets.*

- Specific Eligibility Criteria for Apheresis Platelet Donors
  - Donor platelet count must be > 150K, take sample prior to collection
    - If plt count cannot be obtained in a timely manner (on mobile drive), use the average of the plt counts from previous donations, or enter a “default” value (250k, for example). However, only single units can be collected in such situations
  - If taking anti-platelet medication:
    - Aspirin- defer for at least 2 full medication-free days
    - Plavix/Ticlid- defer for at least 14 full medication-free days
  - Frequency: can donate up to 2x in a week, 24x in a year
  - A minimum of a 48 hour-interval needed after donating single unit, 7 days after donating double or triple units.

**Apheresis RBC Donation**
- Apheresis RBC products have standardized volume and hematocrit
- A single RBC unit can be collected with or without other components collected at the same time.
- Two units (“double RBC”) can also be collected
  - If double unit collected, then deferral interval is 2x that of WB/single RBC donation= 16 weeks
  - Also more stringent criteria regarding donor’s height, weight and hemoglobin: Men must be at least 5’1” and 130 lbs, women must be at least 5’5” and 150 lbs, hematocrit must be 40% or greater

**Apheresis Plasma Donation**
- Apheresis plasma products have a standardized volume (~200ml/unit)
- Depending on donor size and comfort level, can collect 1-3 units (200-600ml) in one session
- Medication deferral: if taking Warfarin(coumadin): defer 7 days after last dose prior to plasma donation
- Total plasma loss for each procedure (including plasma collected in both plasma and platelet products) should not exceed 500ml if donor under 175lbs, 600ml if donor weighs >175lbs.
- Plasma loss within 12mo must not exceed 12L if donor is <175lbs, 14.4L if >175lbs.
- Additional criteria for frequent plasma donors – donors q 28 days or more frequently
  - Serum protein level needs to be >6g/dL
  - SPEP/quantitative immunodiffusion assay should be done once every 4 mo to ensure that plasma fractions are within normal limits
  - Physical exam once every year
  - At least 2 days between donations, and no more than 2 donations within 7 days.
- If only donating plasma products, malarial risks (travel history, treated malarial infection etc) not a reason for deferral

**Other Donor Issues and Concerns**
- Time commitment: 2-3 hours vs. 30min in WB donation
- Adverse events: citrate (anticoagulant used by the collection system, which is infused in to the donor, leading to hypocalcemia) reaction, vasovagal, hematoma, nerve damage, rarely air embolism, hemolysis due to flaw in the plasma kit.
- Overall rates of adverse reactions lower than whole blood donors. Especially hypovolemic and vasovagal types of reactions due to fluid replacement (in the form of anticoagulant that goes back to the donor)
- In addition to plasma loss (see above), RBC loss must be tracked:
  - <300ml over a 8- week period
  - < 12-13L in one year (equivalent to the maximum RBC loss if donor were donating RBC once every 8 weeks)
- There are some concerns for the long-term effects of repeated donations on platelet counts and white cell counts