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Comparison of Methods for Point of Care Preparation of Autologous Platelet Gel

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Abstract: A platelet gel (PG) is produced by the addition of calcium chloride and thrombin to a platelet concentrate (PC). PG releases multiple growth factors, which have the ability to initiate and stimulate one growth factor's function in the presence of others. This finding has resulted in the use of PG in orthopedic, plastic, and reconstructive surgery. The study compared the commercial systems available for the preparation of PG. All procedures were performed according to the manufacturers directions. The devices were evaluated with respect to ease of use, collection efficiency, platelet quality, and growth factor release. The SmartPRep® requires only four processing steps compared to 12 to 24 required by other devices. The SmartPReP® and the CATS® were the most reproducible, as evidenced by their low coefficient of variation of 13% and 16%. The mean platelet yield was 72% for the SmartPReP®, 58% for the 3iPCCS, 54% for the Sequestra®, 31% for the Secquire®, 31% for the CATS®, 27% for the Interpore Cross®, and 42.6% for the Biomet GPS™. The mean total amount of PDGF-AB and TGF-B1 obtained from the SmartPReP® is greater than other systems evaluated. The SmartPReP® produced a consistent PC with a yield that was four times baseline range with the lowest coefficient of variation. **Keywords:** platelet gel, platelet yield, growth factors. *JECT. 2004;36:28–35*