TITLE: COMPARISON OF DIGITAL BLOOD PRESSURE (DBP), THE MODIFIED ALLEN'S TEST (AT), PLETHYSMOGRAPHY (P), AND OXIMETRY (OX) AS DETERMINANTS OF COLLATERAL BLOOD FLOW TO THE HAND.
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INTRODUCTION: The AT, described in 1929 and later modified, became a standard for determining collateral blood flow to the hand. However, the AT is subject to interpretation making validity difficult and requires patient cooperation. OX and P have been used in conjunction with the AT in attempts to alleviate observer error. DBP is also noninvasive and provides a numerical value. This study compared these methods as possible indicators of collateral flow to the hand.

METHODS: Forty-five hands of healthy volunteers were studied after informed consent under Institutional Review Board guidelines. The tests were done in random order. For the modified AT the examiner occluded both the ulnar and radial arteries and timed the return of the palmar blush when first one artery was released then the other. In addition to the AT a plethysmographic OX was placed on the index finger and the arteries were again occluded one at a time. DBP, using a Finapres™ monitor, was also obtained during occlusion of the arteries.

RESULTS: The AT and OX were normal in all cases; palmar blush in $\leq$ 5 secs and no change ($\geq$2%) in saturation. P noted two abnormal flow patterns and the dominant artery in 78%, (22% ulnar=radial). DBP showed the two abnormal arterial patterns (with Sys P falling > 60%). Dominant flow, as indicated by the strict criteria of $\geq$ 17% drop in systolic pressure correlated with P in 29/35 cases. In only two cases (4%) the DBP fell more upon occlusion of the nondominant artery than of the dominant artery.

	AT	OX	P	DBP
Cooperation Required	Yes	No	No	No
Quantifiable	No	No	+/-	Yes
Dominant Flow	No	No	Yes	Yes
Subjective	Yes	No	+/-	No

DISCUSSION: The AT remains subjective. OX was found to be too sensitive, DPG and P noted significant decreases in flow without the OX showing a change in saturation. While P provides a visual signal and it is less subjective than the palmar blush, it is not truly quantifiable. DBP can give a nonsubjective numerical value that is quantifiable and importantly can be accomplished without patient cooperation. The perfect test of collateral flow to the hand would be quantifiable, non-subjective, able to discern dominant arterial flow, and not require patient cooperation. DBP fulfills these criteria with less than 5% false negatives.

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Title: **PREDICTORS OF POST-EXTUBATION STRIDOR IN PEDIATRIC TRAUMA PATIENTS**

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In children suffering from burns and trauma, post-extubation stridor (PES) is a serious problem, and may necessitate reintubation or tracheotomy, despite the risk of subsequent airway injury. Compared with children intubated for elective surgery, trauma patients are at increased risk of PES due to their mechanisms of injury. Possible indicators include mechanical damage associated with emergency intubations; edema associated with third-spaced resuscitation fluids; prolonged intubations; and/or frequent coughing and moving by the child who may be in pain or disoriented. We prospectively evaluated pediatric trauma patients to determine which risk factors were the best predictors of severe post-extubation stridor (PES).

The study was approved by the University of Washington Human Subjects Review Board and informed consent was obtained from each child's parent(s).
Patients were eligible if they were less than 15 years old, hospitalized for burns or trauma, and intubated for >12 hours. The 25 enrolled patients had 30 extubations: 60% were male; the mean age was 85±43 months; 64% suffered head injuries; 20% suffered burns; 17% had a tube too large for the patient's age/weight as defined by tables standard; and 47% had no air leak around the tube at extubation. The duration of intubation ranged from 13 to 624 hours with a median of 45 hours; pre-extubation steroids were given to 20% of patients. PES requiring treatment occurred in 37% of extubations, including re-intubation in 20% of all cases. Absence of air leak at extubation was the strongest predictor of PES, with sensitivity at 100%, and positive predictive value (PPV) at 79%, for $P<0.001$. Burn injury was also a strong predictor, with sensitivity at 64%, and PPV at 88% for $P<0.001$. After controlling for these two factors, no other factor (including duration and location of intubation) was a significant predictor of PES. We conclude that pediatric trauma patients without an air leak at extubation, especially those with burn injuries, are at high risk of PES.