⑥ <Pressure and correlation and a calculation of bloodstream>

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<Pressure (Load)>

P=Pressure(I pressure it perpendicularly)
P1=Pressure to become the measurement domain where blood vessel is the greatest in
P2=Pressure to completely obstruct bloodstream

P1<P2

σ=Shear stress **P+σ=Body pressure**
or **P×σ=Body pressure**

<Bloodstream>

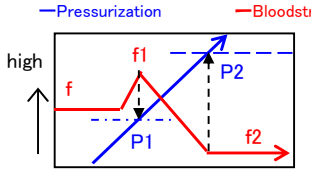
Bloodstream= **f** (flow)
Blood vessel capacity(A blood volume)=**m**(mass)
Flow velocity= **v** (velocity) Regardless of a direction, it is a speed of a part

Bloodstream of no load

m×v=f

Because **v** is the partial speed, there is less influence to ,f than **m**

bloodstream again= **f a. f b**



<Pressure P or Bloodstream>

(m×P1)×v= m×v×P1=f1

m:It is compressed by pressure, and m is greatest a measurement domain

V:A blood vessel narrows by pressure, and a bloodstream speed becomes early

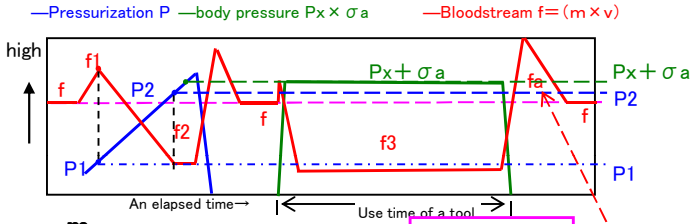
P2?→ **(m÷P2)×(v×P2)=m×v=f2** → **f1>f2**

m:If pressure becomes loud, a blood vessel is destroyed, and M shrinks

P2:By high pressure, a blood vessel narrows, and a bloodstream speed becomes early

<Body pressure (P+σ) or Bloodstream>

①When body pressure is louder than bloodstream complete obstruction pressure



Px?→ $\frac{m}{Px+\sigma a} \times (v \times Px) = f3$ *f3 is a correlation in* =m×v

or $\frac{m}{Px \times \sigma a} \times v \times Px = \frac{m \times v}{\sigma a}$ =f3

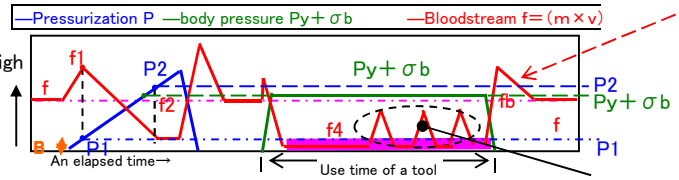
m:If shear becomes big, a blood vessel narrows and, after high pressure, leads to destruction, and blood vessel capacity extremely decreases

PX:Pressure to become the measurement domain where blood vessel is the greatest in

P1<P2≦Px → **f1>f2>f3**

f=Skin bloodstream
f1=The greatest bloodstream at the time of blood vessel compression
f2=A blood vessel blockades it by pressure and obstructs bloodstream
f3=A blood vessel is destroyed with perfection, and bloodstream of a vascular wall obstructs it, too
fa=bloodstream again
P1=Pressure to become the measurement domain where blood vessel is the greatest in
P2=Pressure to completely obstruct bloodstream
Px=Perpendicular weighting
σ=Shear stress(When a soft thing is pushed and transformed it, it occurs by friction)

②When body pressure is lower than bloodstream complete obstruction pressure



During pressure, there is the pressure strengtn that bloodstream spreads in in the shape of a wave

fa>fb
Comparison of re-bloodstream

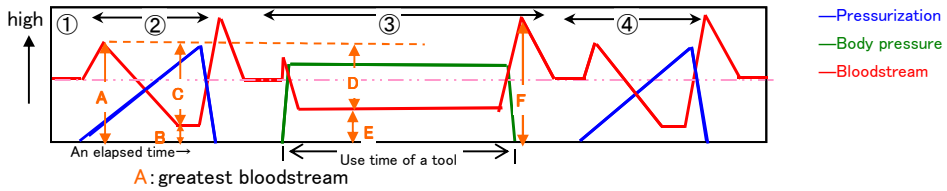
Py?→ $\frac{m}{Py+\sigma b} \times (v \times Py) = f4$

Because **v** is the partial speed, there is less influence to ,f than **m**

or $\frac{m}{Py \times \sigma b} \times v \times Py = \frac{m \times v}{\sigma b}$ =f4 *f4 is a correlation in* =m×v

P1<Py<P2 → **f1>f2 ? f4**

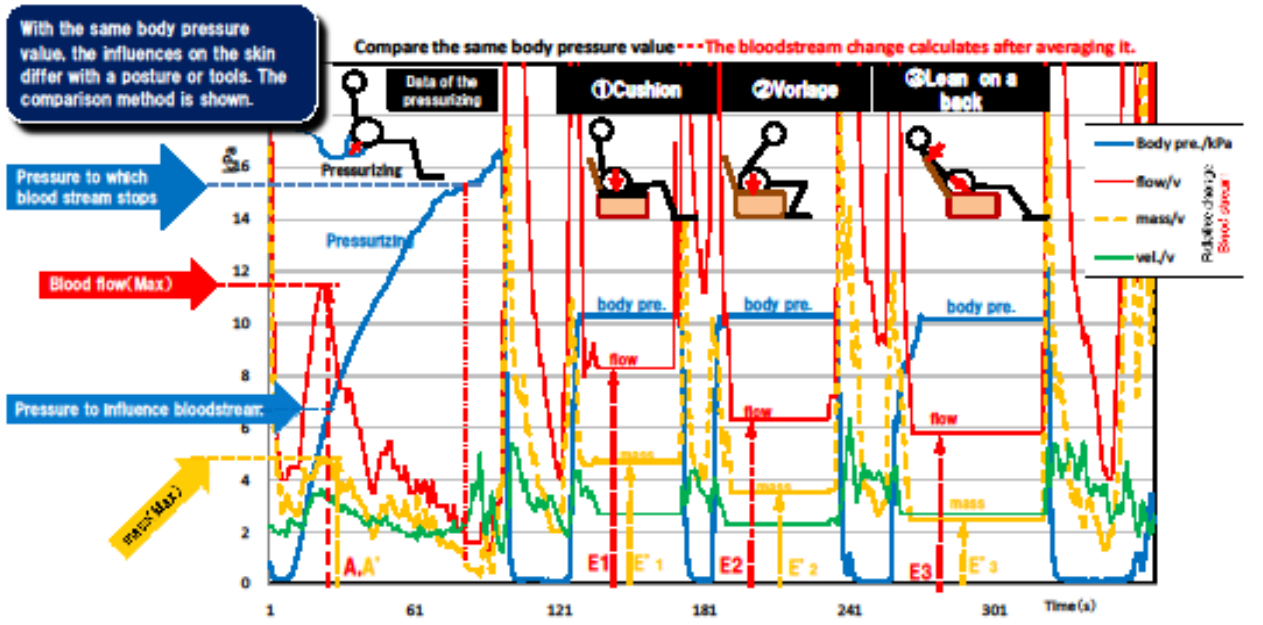
A method: ①I put on **Contact surface pressure / Blood flow sensor (A0010)** to a body
②I wait for bloodstream to be stable. And I cover **Contact surface pressure / Blood flow sensor (A0010)** with **suring chamber (A0203)** and strongly pressurize it slowly.(Data of the bloodstream obstruction situation of a part)
③I exclude **suring chamber (A0203)**, and **Contact surface pressure / Blood flow sensor (A0010)** waits for bloodstream to just return to bloodstream of the basis and I use a tool (A bed, a chair, clothes, a bandage) of an evaluation purpose and continue measuring it
④When it measures with tools for a long time : etc.: And I cover **Contact surface pressure / Blood flow sensor (A0010)** with **suring chamber (A0203)** and strongly pressurize it slowly.(Confirmation of a change of data of the bloodstream disorder situation of a part)



A: greatest bloodstream
B: complete bloodstream obstruction
C: Complete bloodstream obstruction width A-B=**C**
D: Bloodstream obstruction width A-E=**D**
E: bloodstream measurement value
F: return current

<Analysis>

<Tool evaluation Example 1>width that declined of bloodstream**D**、 D÷C=○ or、%(C=90、D=80 flow=89%) ・・・When damage is big, there is it ex
<Tool evaluation Example 2>Bloodstream measurements**E**、 E÷A=○ or、%(A=100、E=20、flow20%)



mass or volume

【As evaluation example】 1、compare it in flow(mass×vel.=flow)　　2、compare it in mass

Condition	Explanation of the posture	A: 11.5	E/A= %	A': 4.9	E'/A'= %
Pressurizing	pressurize skin perpendicularly(Till bloodstream stops)	A: 11.5	-	A': 4.9	-
①	Body pressure is the relaxation with the cushion	E1: 8.3	72 %	E'1: 4.7	96 %
②	Hard bearing surface,Low in vorlage	E2: 6.3	55 %	E'2: 3.5	71 %
③	Lean on a back.However, body pressure asient!?	E3: 5.8	50 %	E'3: 2.5	51 %

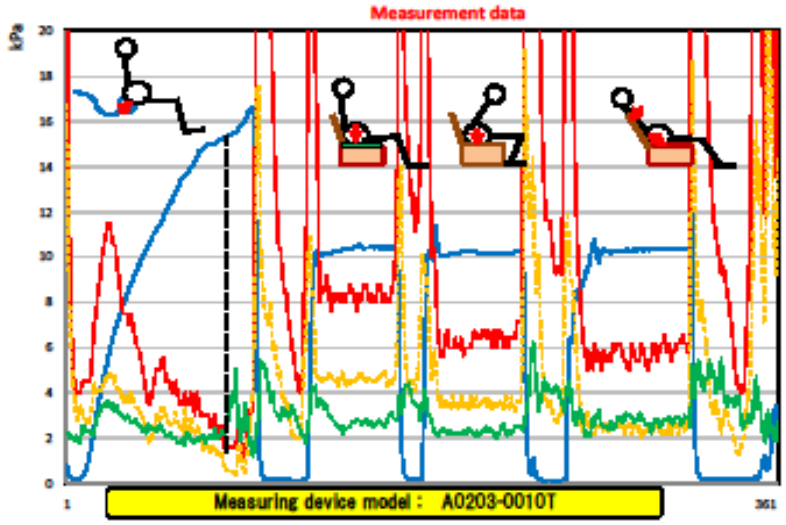
Vel. is not included in evaluation.
That is because it will react greatly if a blood vessel becomes narrow.Moreover, it is because vel. is a partial reaction.
Therefore, it is because it is in inverse proportion to the influence on the skin.

As evaluation example

It is the influence of MASS that flow fell to 50%

As for MASS having fallen to 51%. influence of the shear stress is big

Average



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