

Kossev Consortium
OKCBOATHOUSE FOUNDATION

Stroke Cycle and Rowing Styles

2010
Rowing Coaching Seminars
Part 2

BioRow
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www.BioRow.com

www.biorow.com

Recovery R2
Stretcher Pull

- ü Legs is beginning the movement,
- ü Trunk is finishing preparation

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Contents of the Part 2:

1. Micro-phases of the stroke cycle and effectiveness of rowing;
2. Rowing cycle;
3. Catch;
4. Drive and rowing styles;
5. Finish;
6. Recovery.
7. Rowing drills

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Recovery R3
Stretcher Push

- ü Max. speed of the legs,
- ü Trunk is ready to drive.

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Sub - phases of the stroke cycle

Drive:

- D1. Blade immersion;
- D2. Initial Rower's Acceleration;
- D3. Initial Boat Acceleration;
- D4. Main Rower's Acceleration;
- D5. Main Boat Acceleration;
- D6. Blade Removal;

Recovery

- R1. Arms and Trunk Return;
- R2. Stretcher pull;
- R3. Stretcher push.

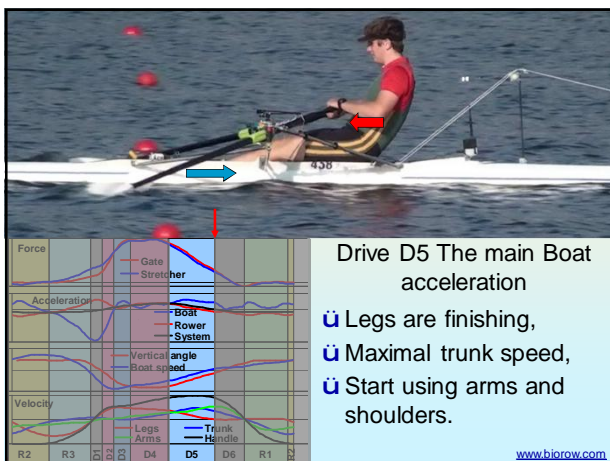
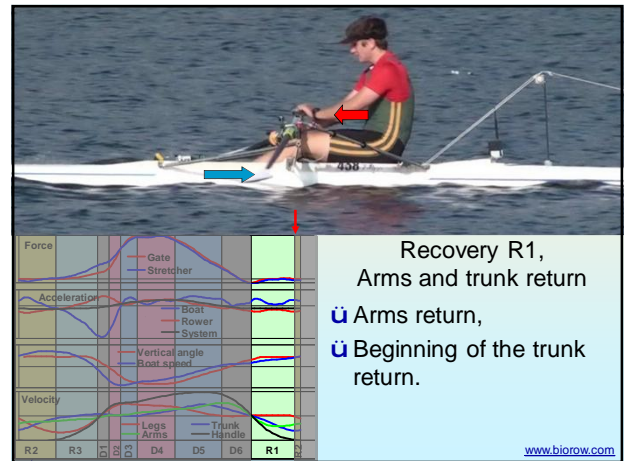
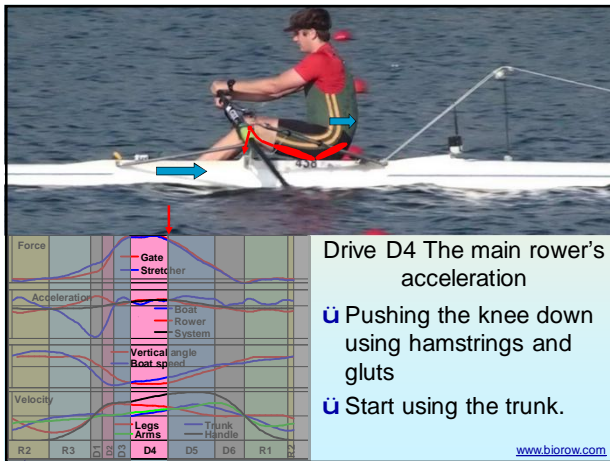
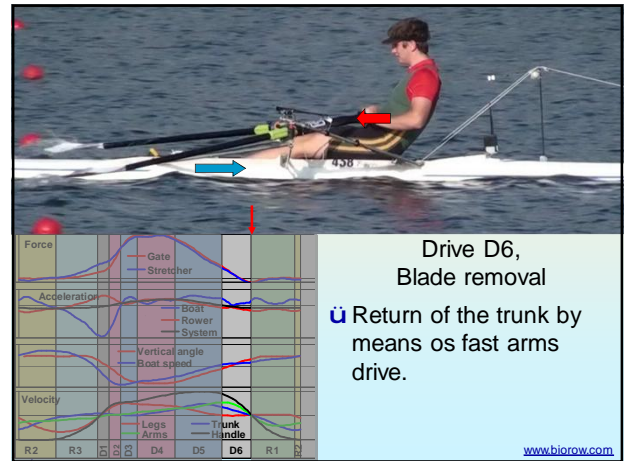
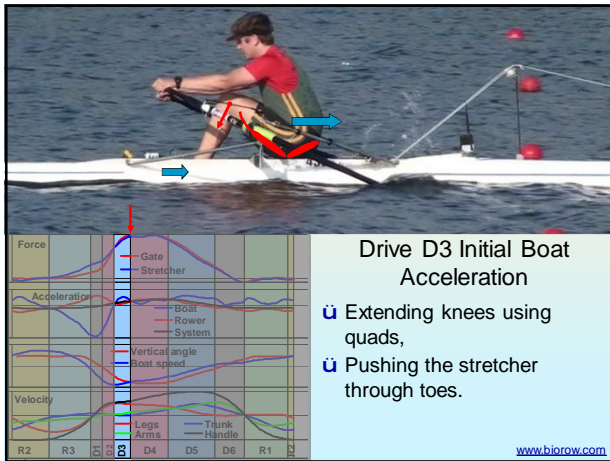
	D1	D2	D3	D4	D5	D6	R1	R2	R3
Time (ms)	72	69	100	232	285	178	268	281	254
Share of Cycle Time (%)	4.1%	4.0%	5.8%	13.3%	16.4%	10.3%	15.4%	16.2%	14.6%
Share of Drive Time (%)	7.7%	7.4%	10.7%	24.7%	30.4%	19.1%	33.4%	35.0%	31.6%

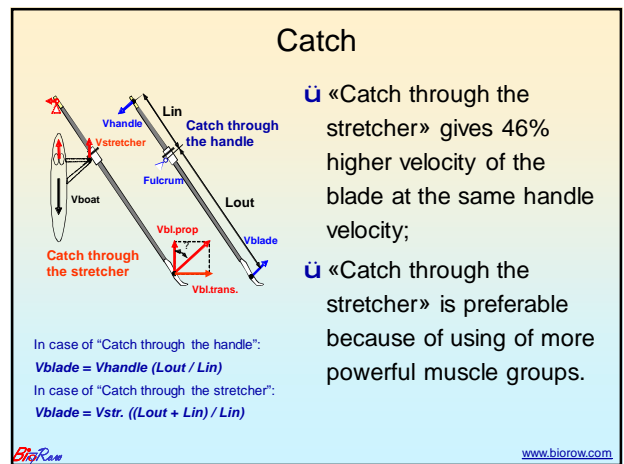
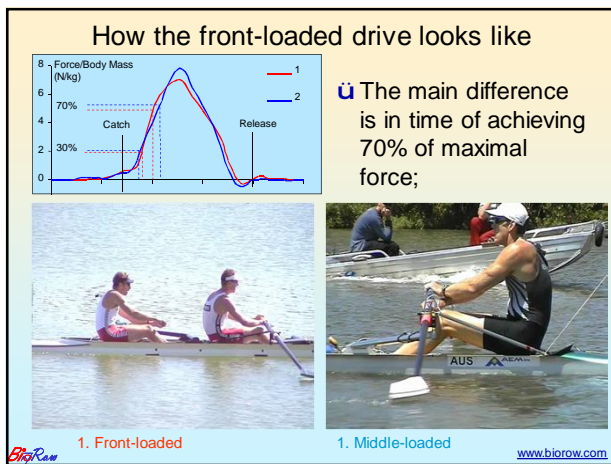
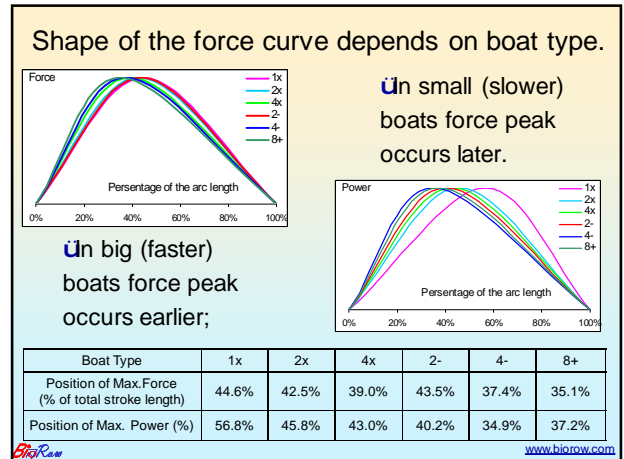
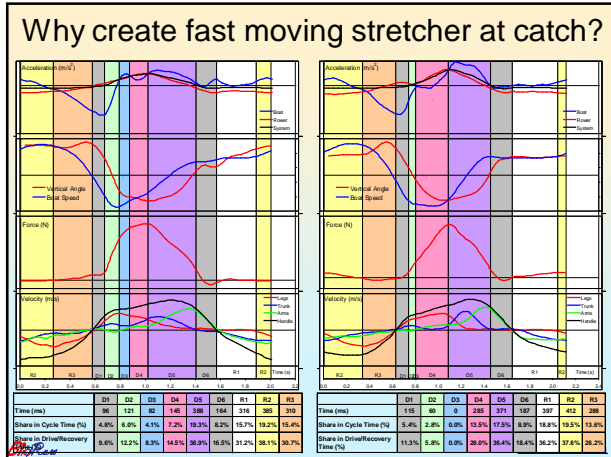
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Drive D1 Blade immersion;
D2 Initial Rower's Acceleration

- ü Catch: the oar change the direction of the movement by means of legs kick through the stretcher.

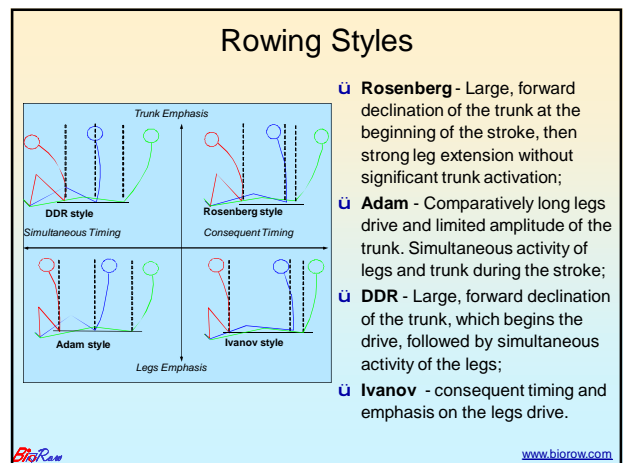
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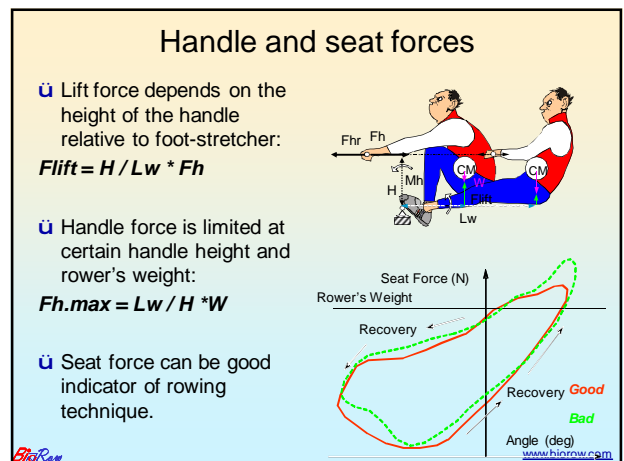
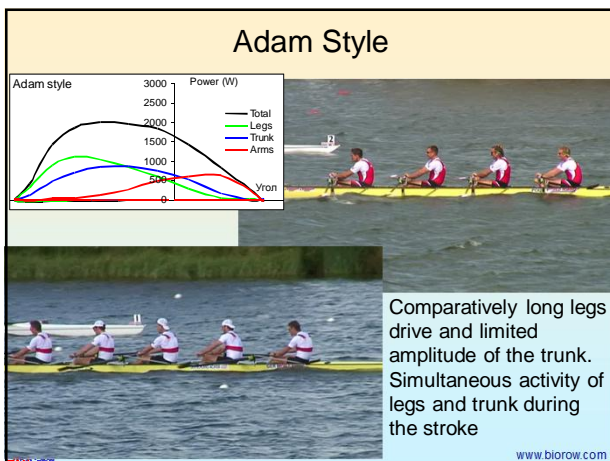
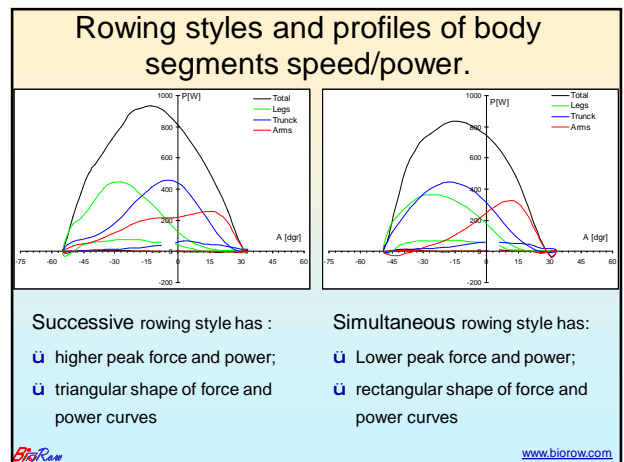
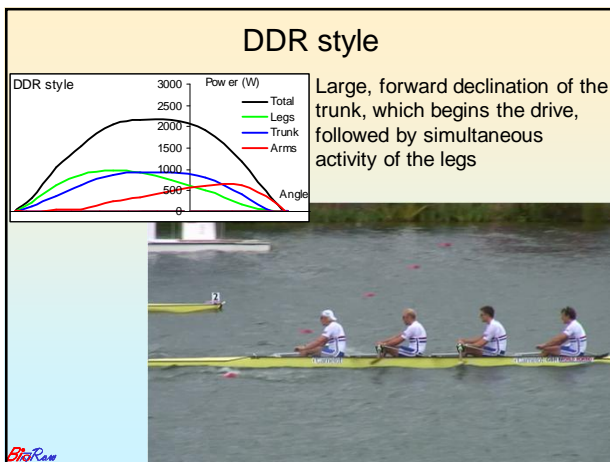
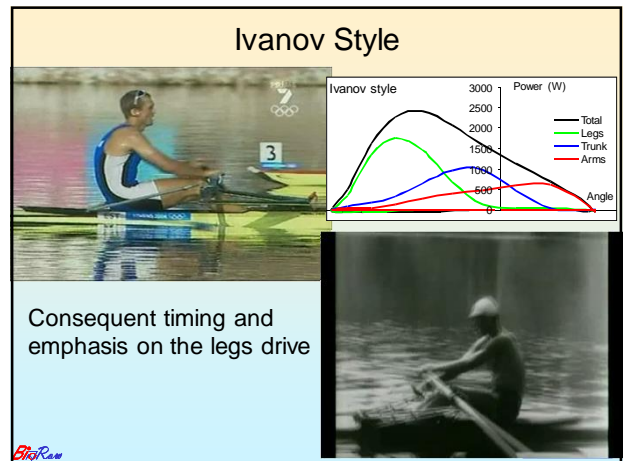
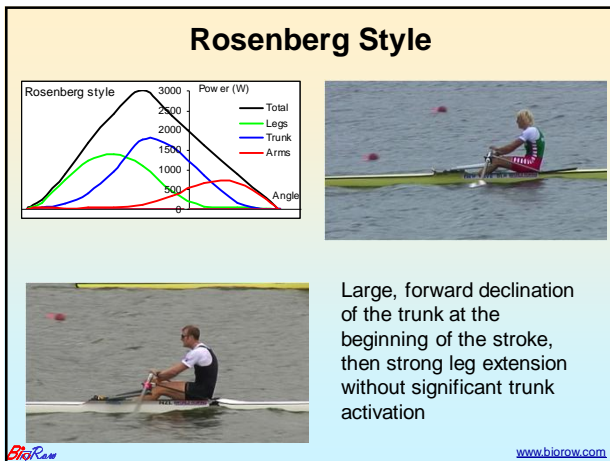




Why front-loaded drive is more efficient?

- The stretcher force must be emphasized, because this is the only force, which accelerated the rower's centre of mass;
- The stretcher (and the boat) must have has to have certain velocity to provide a platform for acceleration of the rower's CM;
- The accelerating force must be applied to the boat at catch as quickly as possible.





Finish

1. "Finish through the handle" creates additional force of the blade, which propels the boat-rower system;
2. "Finish through the handle" does not push the boat down;
3. "Finish through the handle" uses more effective leverage of the oar,
4. "Finish through the handle" allows earlier relaxation of the legs muscles.

ü "Finish through the handle" is the only effective way to finish the drive!

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Thanks for your attention!

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Air drag resistance of the blade during recovery

- ü The blade velocity is higher than the handle velocity by an inboard/outboard ratio;
- ü E.g., the maximal handle velocity 2.92m/s in 8+ at 40str/min would give us 6.88m/s velocity of the centre of the blade;
- ü Boat velocity adds 7.03m/s to the oar velocity (during the recovery it is higher than the average boat speed);
- ü This gives us nearly 15m/s or 54km/h blade speed relative to the air;
- ü The air drag at this speed is very significant. It contributes about 3% of total drag at calm conditions and more than 10% at the head wind of 5m/s.

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Losses due to early squaring the blades

This double is loosing about **10 seconds** due to early squaring (at no wind conditions)

This double will lose about **30 seconds** at head wind 5m/s

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