Η πρακτική εφαρμογή του GPS στο σύγχρονο ποδόσφαιρο

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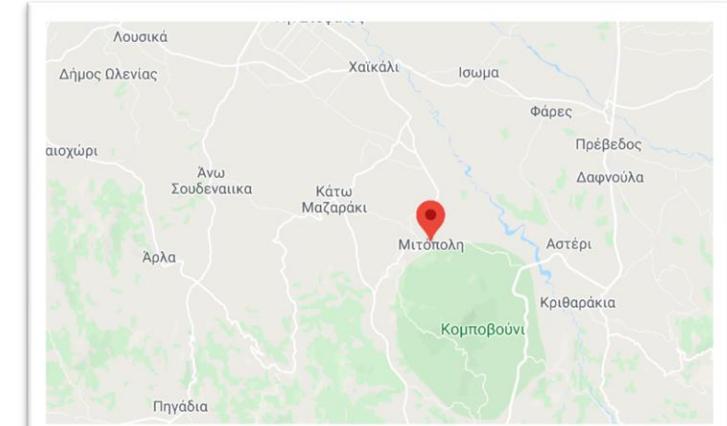
Comparison of physical and technical performance in European soccer match-play: FA Pr... ...ue and La Liga

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Quantification of in-season training load relative to match load in professional Dutch Eredivisie football players

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Physical Demands of Top-Class Soccer Friendly Matches in Relation to a Playing Position Using Global Positioning System Technology

by
..., Fabio Nevado[³], Víctor Paredes[⁴]

Physical and metabolic demands of training and match-play in the elite football player

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Abstract

In soccer, the players perform intermittent work. Despite the players performing low-intensity activities for more than 70% of the game, heart rate and body temperature measurements suggest that the average oxygen uptake for elite soccer players is around 70% of maximum (VO_{2max}). This may be partly explained by the 150–250 brief intense actions a top-class player performs during a game, which also indicates that the rates of creatine phosphate (CP) utilization and glycolysis are frequently high during a game. Muscle glycogen is probably the most important substrate for energy production, and fatigue towards the end of a game may be related to depletion of glycogen in some muscle fibres. Blood free-fatty acids (FFAs) increase progressively during a game, partly compensating for the progressive lowering of muscle glycogen. Fatigue also occurs temporarily during matches, but it is still unclear what causes the reduced ability to perform maximally. There are major individual differences in the physical demands of players during a game related to physical capacity and tactical role in the team. These differences should be taken into account when planning the training and nutritional strategies of top-class players, who require a significant energy intake during a week.

Keywords: Match-play activity pattern, substrate utilization, muscle metabolites, fatigue, recovery after matches, training ...ensity

Physiology of Soccer
An Update

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ΔΙΟΡΓΑΝΩΣΗ

ΣΥΝΔΕΣΜΟΣ ΠΡΟΠΟΝΗΤΩΝ ΠΟΛΟΣΦΑΙΡΟΥ

ΠΑΝΕΛΛΗΝΙΑ ΕΝΩΣΗ ΠΡΟΠΟΝΗΤΩΝ ΠΟΛΟΣΦΑΙΡΟΥ

The training process

External Load + **Ind.Characteristics**

INTERNAL LOAD

+ Fitness

- Fatigue

Technical-tactical qualities

Banister (1971)
Impellizzeri et al. (2005)

Τα GPS ή αλλιώς 'φορητή τεχνολογία'

Οι μονάδες παγκόσμιου συστήματος εντοπισμού θέσης (GPS) είναι μια τεχνολογία πλοήγησης μέσω δορυφόρου, η οποία έχει χρησιμοποιηθεί στον επαγγελματικό αθλητισμό τα τελευταία χρόνια.

Διαθέτουν ενσωματωμένα:

- GPS
- Αξελερόμετρο
- Μαγνητόμετρο
- Καρδιοσυχνόμετρο
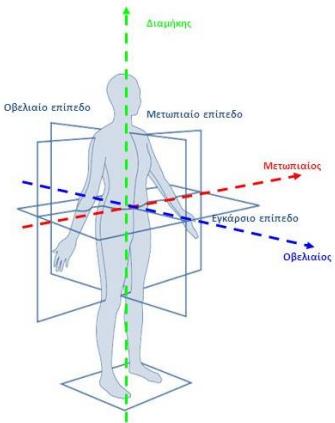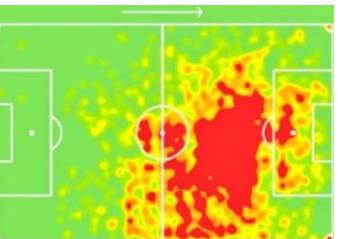
Τι Μετρούν;
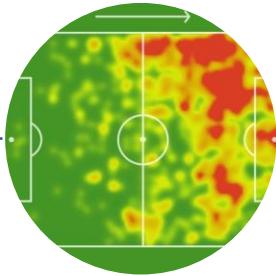
Απόσταση (m) και Ταχύτητα (m/s)

Επιταχύνσεις και επιβραδύνσεις (m/s)

Αλλαγές κατεύθυνσης

Τυπικός Αγώνας

Τυπικός Μικρόκυκλος
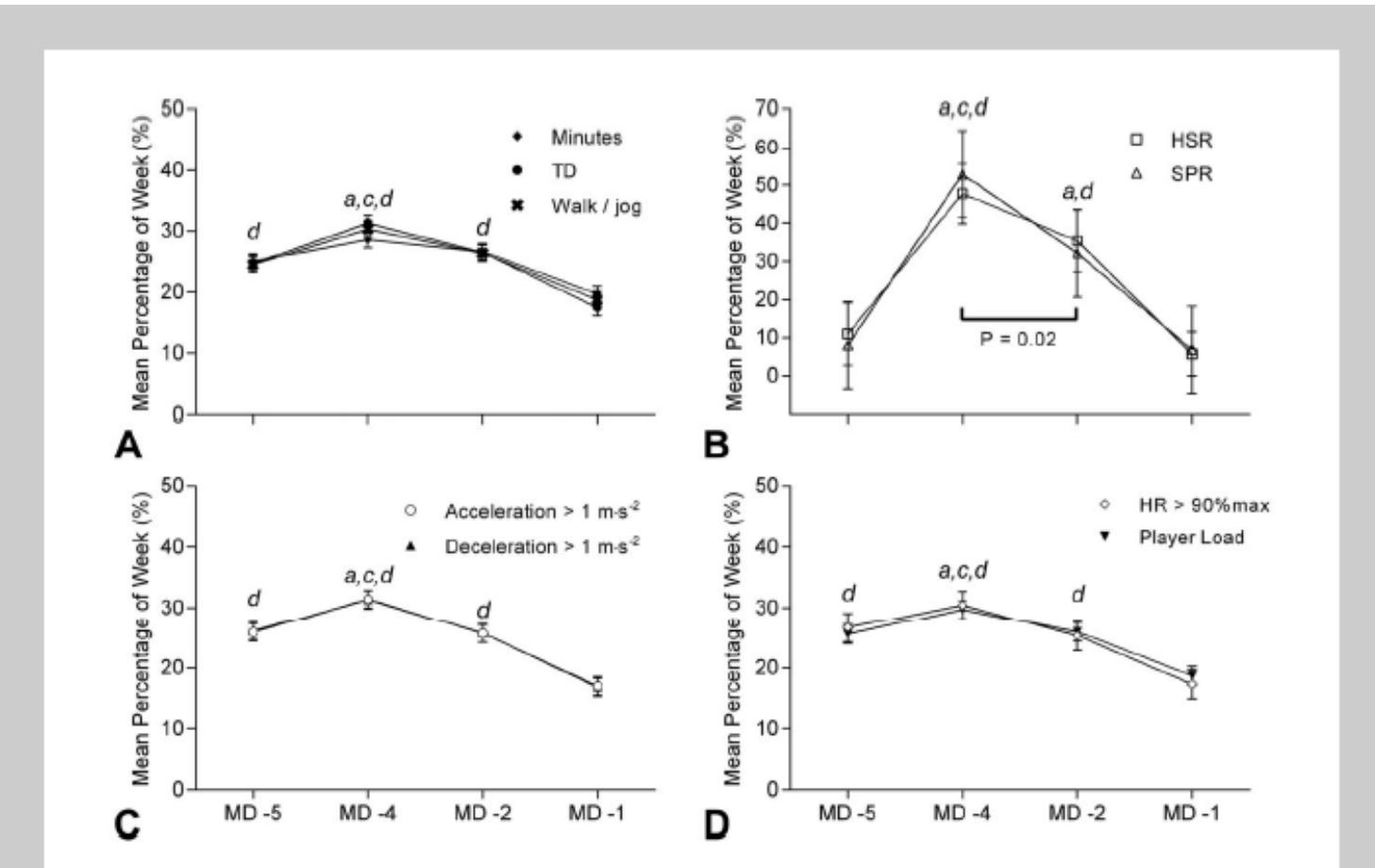
Figure 1. Mean percentage distribution of measured variables across representative training weeks. Error bars represent 95% confidence intervals. a, greater than MD − 5; c, greater than MD − 2; d, greater than MD − 1. All differences are $p < 0.001$ unless otherwise stated. TD, total distance; HSR, high-speed running distance; SPR, sprint running distance; MD − x, x days before the match.

Akenhead et al., (2016)

Τυπικός Μικρόκυκλος
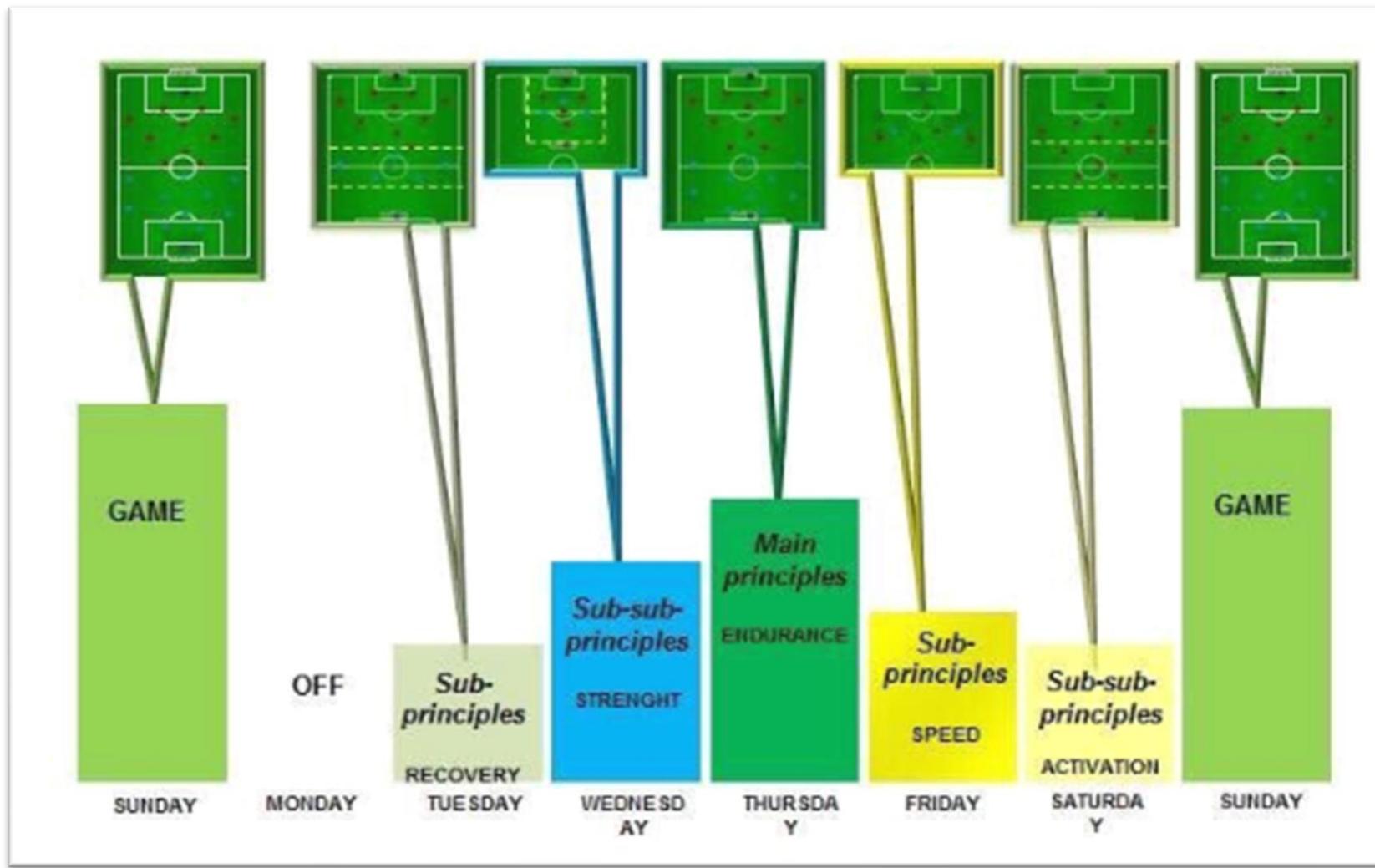
Παράδειγμα από Leeds United

| Zone	Speed (m/s)	Speed (km/h)	Description
Zone 1	0-1.6	0-6.0	Stand, walk, sit
Zone 2	1.7-3.3	6.1-12.0	Walk, jog, cruise
Zone 3	3.4-3.9	12.1-14.0	Jogging, cruising, striding
Zone 4	4-5	14.1-18.0	Fast-paced jog, running, striding
Zone 5	5-6.3	18.1-23.0	Running, high-intensity running
Zone 6	>6.4	>23.1	Sprinting, maximal-intensity

	Match 1 07:18.0			Match 2 07:10.0			Match 3 05:20.0			Match 4 04:16.0			Match 5 05:41.0			TOTAL 29:45.0			Ratio/min		
	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS
	1200	71	5	966	56	29	800	38	36	574	21	26	779	19	74	4319	203	170	145	6.8	5.7
	1242	188	46	970	64	14	801	75	34	655	52	35	826	30	19	4494	409	149	151	13.7	5.0
	1026	19	17	812	10	0	596	1	0	537	3	0	697	39	20	3668	72	38	123	2.4	1.3
	1085	53	41	1065	35	66	790	23	82	592	23	32	872	90	43	4403	224	264	148	7.5	8.9
	991	29	18	968	57	32	711	40	42	573	36	0	642	26	3	3886	188	95	131	6.3	3.2
	1213	78	25	1054	45	11	814	20	0	635	33	0	851	43	12	4568	219	47	154	7.4	1.6
	977	7	16	849	12	20	578	26	0	560	39	45	672	19	0	3636	103	81	122	3.5	2.7
	1180	71	2	1140	75	15	846	31	35	739	51	35	867	47	15	4771	275	102	160	9.3	3.4
	1025	20	0	1060	24	11	771	4	0	661	14	5	763	30	39	4280	91	56	144	3.1	1.9
	1160	99	25	951	6	0	678	40	26	587	47	26	675	17	13	4050	208	89	136	7.0	3.0
Average	1110	63	20	984	38	20	738	30	25	611	32	20	764	36	24	4208	199	109	141	6.7	3.7
STDEV	100	53	15	101	25	19	94	21	26	61	17	17	88	22	22	384	99	69	13	3.3	2.3
	1137	56	8	843	29	10	742	16	35	611	42	3	776	32	15	4109	174	70	138	5.9	2.4
				956	51	24	611	39	5	605	56	27				2173	145	56	130	8.6	3.3
	1004	36	14	998	52	27	770	45	63	573	44	15	791	39	9	4136	216	127	139	7.3	4.3
	982	26	17	795	22	30	716	13	2	522	31	3	688	41	0	3702	133	52	124	4.5	1.7
	1185	88	11	1078	39	13	701	28	61	577	50	36	858	25	19	4399	229	140	148	7.7	4.7
	978	5	0	862	6	0	656	14	10	645	41	2	668	7	14	3808	73	26	128	2.4	0.9
Average	1057	42	10	922	33	17	699	26	29	589	44	14	756	29	11	3721	162	78	135	6.1	2.9
STDEV	97	32	6	107	18	12	58	14	28	42	8	14	78	14	7	799	58	45	9	2.3	1.5

ΔΙΟΡΓΑΝΩΣΗ

ΣΥΝΔΕΣΜΟΣ ΠΡΟΠΟΝΗΤΩΝ ΠΟΔΟΣΦΑΙΡΟΥ

ΠΑΝΕΛΛΗΝΙΑ ΕΝΩΣΗ ΠΡΟΠΟΝΗΤΩΝ ΠΟΔΟΣΦΑΙΡΟΥ

Πρακτική Εφαρμογή του GPS #1

- 12km/90min = 133.3m/min
- 133.3m/min = 7.9km/h

	Match 1 07:18.0			Match 2 07:10.0			Match 3 05:20.0			Match 4 04:16.0			Match 5 05:41.0			TOTAL 29:45.0			Ratio/min		
	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS	DT	DHI	DS
	1200	71	5	966	56	29	800	38	36	574	21	26	779	19	74	4319	203	170	145	6.8	5.7
	1242	188	46	970	64	14	801	75	34	655	52	35	826	30	19	4494	409	149	151	13.7	5.0
	1026	19	17	812	10	0	596	1	0	537	3	0	697	39	20	3668	72	38	123	2.4	1.3
	1085	53	41	1065	35	66	790	23	82	592	23	32	872	90	43	4403	224	264	148	7.5	8.9
	991	29	18	968	57	32	711	40	42	573	36	0	642	26	3	3886	188	95	131	6.3	3.2
	1213	78	25	1054	45	11	814	20	0	635	33	0	851	43	12	4568	219	47	154	7.4	1.6
	977	7	16	849	12	20	578	26	0	560	39	45	672	19	0	3636	103	81	122	3.5	2.7
	1180	71	2	1140	75	15	846	31	35	739	51	35	867	47	15	4771	275	102	160	9.3	3.4
	1025	20	0	1060	24	11	771	4	0	661	14	5	763	30	39	4280	91	56	144	3.1	1.9
	1160	99	25	951	6	0	678	40	26	587	47	26	675	17	13	4050	208	89	136	7.0	3.0
Average	1110	63	20	984	38	20	738	30	25	611	32	20	764	36	24	4208	199	109	141	6.7	3.7
STDEV	100	53	15	101	25	19	94	21	26	61	17	17	88	22	22	384	99	69	13	3.3	2.3
	1137	56	8	843	29	10	742	16	35	611	42	3	776	32	15	4109	174	70	138	5.9	2.4
				956	51	24	611	39	5	605	56	27				2173	145	56	130	8.6	3.3
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	978	5	0	862	6	0	656	14	10	645	41	2	668	7	14	3808	73	26	128	2.4	0.9
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Μέγιστα φορτία
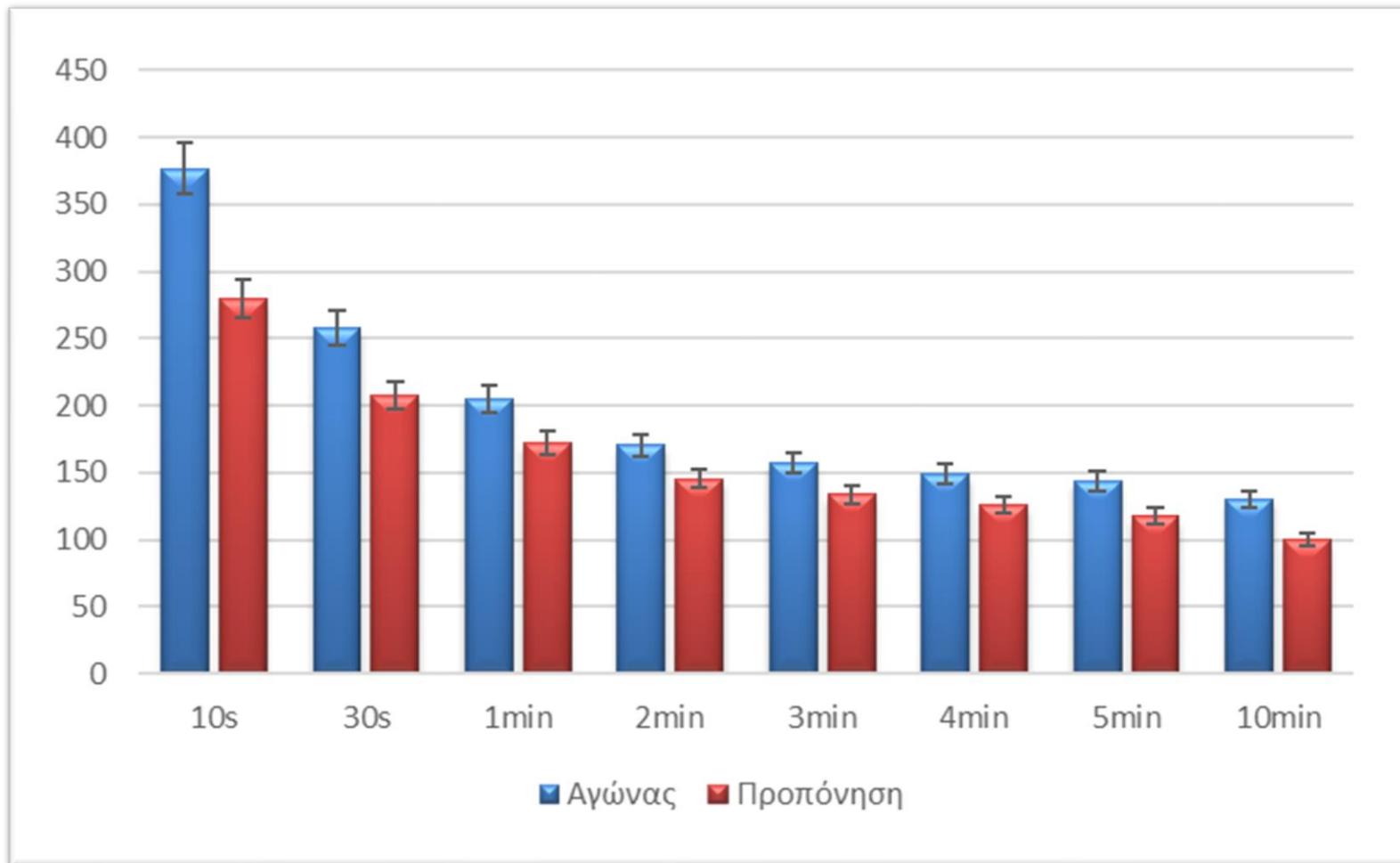
Πρακτική Εφαρμογή του GPS #2

Πρακτική Εφαρμογή του GPS #3

Acceleration- Deceleration- High Intensity Efforts
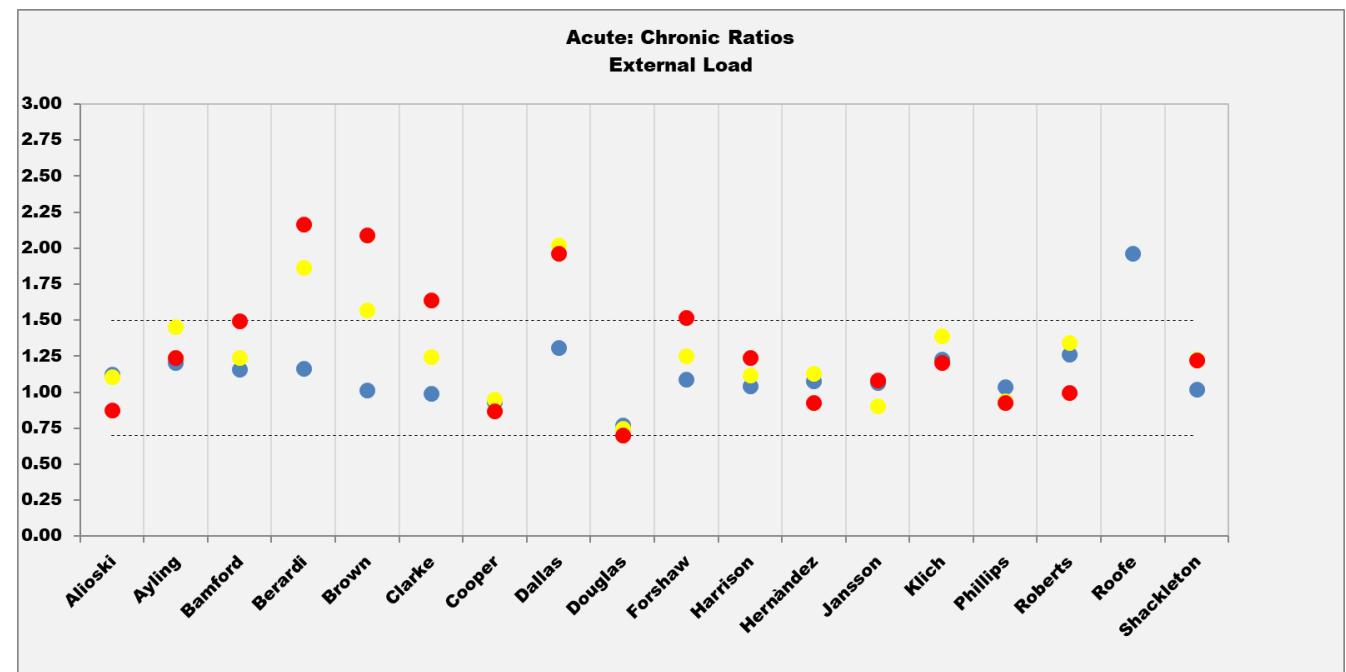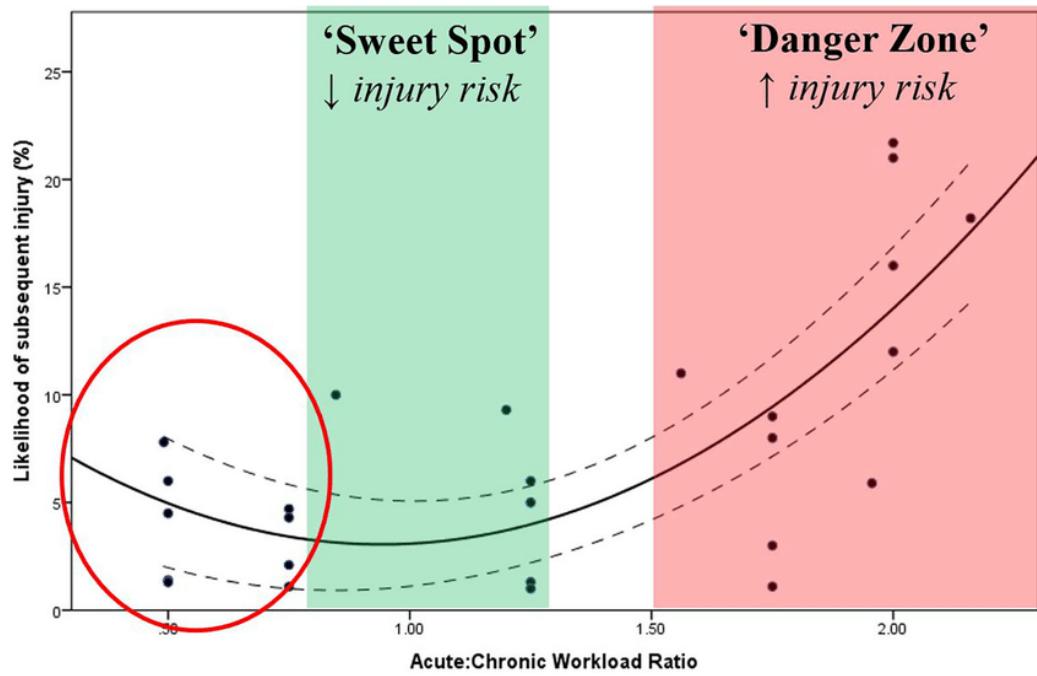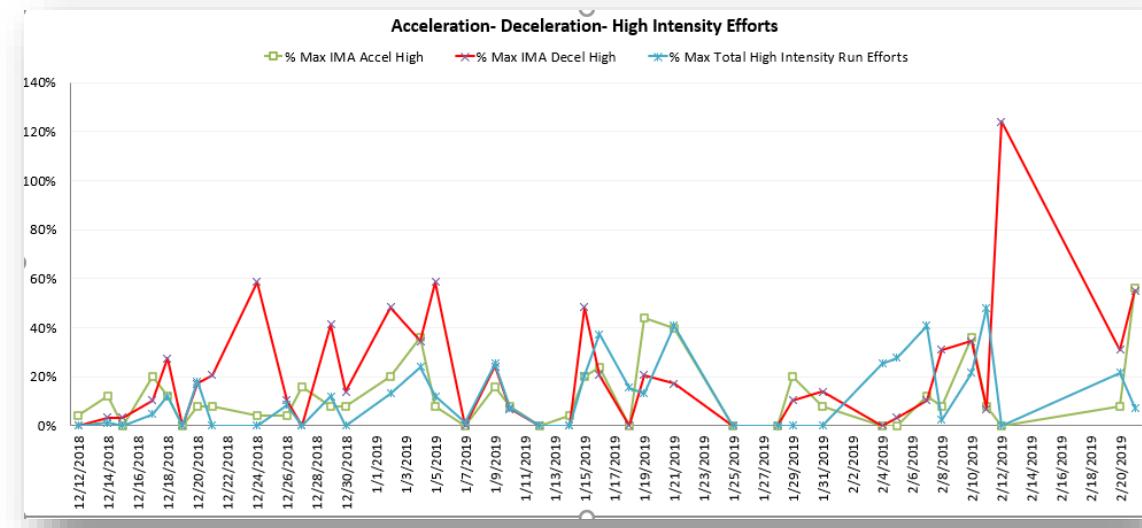
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