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EXERCISE PROGRAMMING IN A POLICE ACADEMY—SAMPLE PROGRAM AND LOGISTICAL CONSIDERATIONS

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INTRODUCTION

It is the task of a police training academy to prepare recruits for the job. A component of this preparation is physical training. Police academy physical training programs can benefit the recruit's occupational performance and overall health (2,6,10,17). These programs must prepare recruits to perform a myriad of activities to include, but not limited to, victim rescues and confrontations by suspects (1). Physical strength and power are attributes that affect performance in these situations (14,15,16,26). Undoubtedly, poor or inadequate physical training creates risk for the public, the officer, and legal liability for the agency (3). For these reasons, strength and power have been identified as physical attributes that will positively contribute to a law enforcement officer's operational success. For the trainees, strength and power development will prepare them for the critical tasks of the job and reduce their risk of injury (7). This article provides an overview of a resistance training program for tactical strength and conditioning facilitators in large law enforcement academy settings.

Strength is defined as the maximal force a muscle or muscle group can generate at a specific velocity (9). This is the ability to move a maximum amount of weight. Power, on the other hand, is defined as the product of force and velocity (9). This is the ability to move an external load quickly. While not commonly discussed in reference to law enforcement recruit training, strength and power can be augmented by hypertrophy training (5). Muscle hypertrophy is defined as an increase in the size of the muscle tissue (23). Muscle size plays an important part in strength development and is an indicator of strength potential (13). Additionally, while there is no formal research on the topic, it is suggested that muscle size may elevate an officer's presence, which is considered the best way to resolve a situation, by giving them a more formidable appearance (27).

With the need for strength, power, and hypertrophy training in law enforcement academies, the next obstacle is how to conduct these training sessions effectively and efficiently. Below is an example of a strength, power, and hypertrophy program in a large police academy setting. This program has been conducted with training class sizes between 50 – 100 recruits, facilitated by 1 – 4 academy staff members.

SAFETY CONSIDERATIONS

Prior to engaging in these training sessions, the recruits are instructed on how to properly perform the lifts. They are also coached on how to properly spot lifts. A requirement is established that, regardless of weight, barbell squats and bench presses must have a spotter present. If no spotter is present, the recruits are not permitted to perform the lift.

Organization of people and equipment in the training space is paramount for the safety of the recruits and the efficiency of the training session. All those not currently performing their set nor spotting must be well out of the way but prepared for when it is their turn.

INITIAL TESTING AND CREATION OF TRAINING GROUPS

Among other fitness attributes, maximal strength is tested during an initial assessment block of physical training. Strength is assessed via one-repetition maximum (1RM) testing of the deadlift and overhead press. These movements are used due to the reduced need for a spotter and increased ability to abort from the lift, if needed. Based on the results of the strength testing, the recruits are split up into groups based on their strength level. Each recruit is placed into three groups: upper body strength, lower body strength, and a group for hypertrophy training.

For example, one set of groups for deadlift and another set of groups for overhead press. The number of groups and number of trainees in each group is largely dictated by the available equipment and space. In future strength training sessions, the loads prescribed will be a percentage of the group's average working max (WM) (90% of measured 1RM). Table 1 displays example strength groups.

A third set of groups is created for hypertrophy training. With the results of the strength testing, recruits are grouped based on a weighted total of their strength movements. The equation developed at the academy level is: weighted total = 1RM overhead press + (1RM deadlift / 2). Due to equipment and space limitations, in future hypertrophy training sessions, the loads for the hypertrophy circuit are predetermined and estimated based on the average strength level of the group. Table 1 displays example hypertrophy training groups with a maximum of 12 recruits in each group due to the 12 stations in the functional hypertrophy circuit.

STRENGTH, POWER, AND HYPERTROPHY SESSION OVERVIEW

The strength, power, and hypertrophy sessions are conducted twice per week, with a minimum of 48 hr between sessions. The first session of the week emphasizes lower body strength and power, while the second session emphasizes upper body strength and power. Both sessions finish with a full-body hypertrophy circuit. Strength, power, and hypertrophy are trained in the same session due to their mutually beneficial characteristics. Additionally, other days are used to train other attributes, such as cardiorespiratory endurance, muscular endurance, speed, and agility. Table 2 shows how these sessions fit into a typical week of physical training.

GENERAL AND SPECIFIC WARM-UP (10 MIN)

The session begins with a five-minute general warm-up. This warm-up is intended to increase heart rate and body temperature with nonspecific movements. It tends to look like a combination of light running and bodyweight exercises. The recruits immediately split up into their respective strength groups (Table 1) and begin a five-minute specific warm-up. This prepares them for the heavy loads of their working sets (4,11,25). The specific warm-up is conducted by performing the strength movement of the day with an empty barbell and progressively increasing the weight until the recruits reach their prescribed working load.

STRENGTH AND POWER (20 MIN)

Each resistance training session has one strength movement and one power movement paired as a superset. With the recruits in their strength groups and ready to begin the prescribed working sets, a running clock marks the start of this training evolution. The first recruit in the group performs their prescribed repetitions of the strength movement, who is immediately followed by the next recruit in the group, so on and so forth. After their individual strength set, each recruit rests three minutes before performing their prescribed power movement. After completing the power movement, and once every recruit in the group has completed their strength sets, the first recruit can then begin their next set of the strength movement. The rest interval between strength movements aligns with the National Strength and Conditioning Association's (NSCA) recommendation of 2 – 5 min between core exercises with heavier loads (18). This continues until all the recruits in each group have completed their prescribed sets and repetitions of the strength movement and power movement.

The NSCA recommends strength training be performed in the 8 – 12 repetition range with 60 – 70% 1RM for novice lifters and progress to 6 repetitions or fewer with 80 – 100% 1RM for trained lifters (18). For power training, the NSCA recommends anywhere from unloaded ballistic movements to 85% of 1RM for explosive lifts, such as power cleans or push jerks (18). Due to the training status of the typical police recruit observed by the author, unloaded ballistic movements, such as standing vertical jumps and broad jumps, performed at maximum effort are selected for the power training. This provides a valuable opportunity to observe and coach movement mechanics, like jumping and landing, while striving to maximize their power development with a dampened concern for injury. The recruits are progressed to light load ballistic movements, such as standing vertical jumps while wearing a weight vest, later in the training block after proper mechanics have been established. Table 3 shows an example prescription of sets, repetitions, loads, and progression of lifts.

FUNCTIONAL HYPERTROPHY CIRCUIT (34 MIN)

An initial 10 min is utilized to brief all the movements, answer any questions, and offer the recruits time to prepare. There are 12 stations per circuit, and a movement-based approach is utilized for exercise selection. The stations are as follows: rest, squat, vertical pull, horizontal push, rest, hinge, horizontal pull, vertical push, rest, rotation, trunk isometric, and skill. Table 4 lists exercise examples for each station.

Each hypertrophy group (Table 1) has their own circuit prepared with weights estimated to be appropriate for their strength level. With six groups, there are six separate circuits with weights commensurate with the group's strength level. The stations of each circuit are organized in a line. All recruits are at their own station within their circuit before the training evolution begins. A running clock is started and the recruits perform the prescribed number of repetitions at their station within one minute, with any remaining time available for rest. At the conclusion of the minute, the recruits move to the next station in the circuit and immediately begin the next exercise for the prescribed repetitions. The recruits perform two rotations through the circuit for a total of 24 min in an "every minute on the minute" format. Rest stations are strategically placed to maximize lifting performance (19,20,21,24). Three of the stations (trunk isometrics, rotation, and skill) do not have the primary goal of inducing hypertrophy and are more a means of including transverse plane movement, trunk stability, and job task-specific training while fatigued. Those three stations are the reason for the "functional" in "functional hypertrophy circuit" and, in the author's experience, often require a modification to the repetition scheme due to the nature of the exercises.

The NSCA recommends hypertrophy training be conducted in the 6 – 12 repetition maximum range, with hypertrophic effects also observed outside of this range (18,22). The repetition prescription outlined in Table 3 aligns with these parameters. It is recommended that most sets are completed with one or two repetitions in reserve (RIR) (23). Recruits are instructed to modify their tempo in such a way as to reach this RIR goal. While there are benefits to shorter rest intervals, it is recommended that they are at least two minutes to maximize the hypertrophic effect (23). The circuit format involves approximately three minutes of rest between similar movements. For total weekly volume, 10 – 20 sets per muscle group per week is regarded as a general

recommendation (23). Completing the functional hypertrophy circuit twice per week provides eight sets per week each of the upper body push pattern, upper body pull pattern, and lower body dominant movements. While these fall short of the 10 – 20 sets per muscle group recommendation, evidence suggests there is a dose-response relationship wherein hypertrophic effects will still be obtained (23). If more time was available, greater volume could be added.

CLEAN-UP COOL-DOWN DEBRIEF (11 MIN)

At the conclusion of the hypertrophy circuit, the recruits have ten minutes to get the equipment put away and spend some time on mobility and a cool-down, which tends to look like non-specific light activity (8). This is also a good opportunity to debrief the training session. Recruits can provide insights on the exercise and load selections, which could enhance future training sessions.

EXPERIENCED DRAWBACKS

One of the primary drawbacks to this program is that set-up time can be lengthy. The training space is set up the evening prior with all training implements and prescribed loads. This prevents set up from cutting into valuable training time.

Training with group averages is not ideal. Great care is taken to group recruits with similar strength levels but having a perfectly homogeneous group may not be possible based on time, space, and equipment. When you have multiple people in one lifting group performing the same movement with the same load, issues can arise with the weight being slightly too heavy or slightly too light for the intended stimulus. An open dialogue between recruits and staff is beneficial here. Modifications to load, tempo, and repetitions may need to be made on the fly. The recruit can also be moved into an adjacent group as needed. In rare instances, there is an outlier where one recruit is considerably stronger or weaker than the rest of the group. In this circumstance, accommodations must be made to ensure an effective stimulus for the particularly strong recruit and the safety of the particularly weak recruit.

During the functional hypertrophy circuit, especially the first one, the loads prescribed are simply the best estimation of the training staff. Again, an open dialogue between recruits and staff is beneficial for making proper adjustments. The prescribed loads may need an impromptu change. The author has found it beneficial to clearly state the goal (finish each set within three repetitions of failure) and instruct the recruits to modify the tempo of the lifts in such a way as to achieve this 0 – 2 RIR goal. To improve the accuracy of the weight selections, exercises are often repeated or only slightly modified from session to session. For example, altering a goblet squat into a goblet squat with one foot on an elevated platform is a simple modification relevant for tactical professionals (12). To select loads most accurately for each training session, all weights used are recorded, along with feedback from recruits.

CONCLUSION

Strength, power, and hypertrophy training is needed in police academies. This training program was created based on the need to train 50 – 100 recruits with 1 – 4 academy staff members, along with limitations in time, equipment, and space. Fortunately, the number of modifications that can be made to this format is limited only by creativity. Nearly every facet of this training program, including exercises, sets, repetitions, loads, rounds, and groups, are modifiable to meet the time, space, and equipment limitations of an organization.

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TABLE 1. EXAMPLE STRENGTH AND HYPERTROPHY GROUPS

OVERHEAD PRESS GROUPS					DEADLIFT GROUPS					FUNCTIONAL HYPERTROPHY GROUPS					
GROUP	NAME	1RM	90%	WM	GROUP	NAME	1RM	90%	WM	GROUP	NAME	OHP	DEADLIFT	TOTAL	WEIGHTED
1	R 7	195	176	162	1	R 1	495	446	414	1	R 1	175	495	670	423
	R 4	185	167			R 10	455	410			R 2	185	455	640	413
	R 2	185	167			R 3	455	410			R 3	170	455	625	398
	R 1	175	158			R 2	455	410			R 4	185	410	595	390
	R 6	170	153			R 5	440	396			R 5	165	440	605	385
	R 3	170	153		2	R 9	430	387	375		R 6	170	420	590	380
2	R 11	170	153	146		R 6	420	378			R 7	195	365	560	378
	R 5	165	149			R 13	420	378			R 8	155	420	575	365
	R 14	160	144			R 8	420	378			R 9	145	430	575	360
	R 15	160	144			R 12	410	369		2	R 10	130	455	585	358
	R 17	155	140			R 4	410	369			R 11	170	370	540	355
3	R 8	155	140	133		R 16	405	365			R 12	145	410	555	350
	R 29	150	135		3	R 22	385	347	333		R 13	135	420	555	345
	R 9	145	131			R 11	370	333			R 14	160	360	520	340
	R 12	145	131			R 18	365	329			R 15	160	360	520	340
	R 18	145	131			R 19	365	329			R 16	135	405	540	338
	R 26	145	131			R 7	365	329			R 17	155	360	515	335
4	R 21	145	131	127	4	R 20	365	329	325		R 18	145	365	510	328
	R 20	145	131			R 25	360	324			R 19	145	365	510	328
	R 27	145	131			R 14	360	324			R 20	145	365	510	328
	R 19	145	131			R 17	360	324			R 21	145	360	505	325
	R 28	140	126			R 21	360	324		3	R 22	125	385	510	318
	R 13	135	122		5	R 15	360	324	315		R 23	135	350	485	310
	R 23	135	122			R 39	360	324			R 24	135	345	480	308
5	R 34	135	122	121		R 23	350	315			R 25	125	360	485	305
	R 40	135	122			R 35	345	311			R 26	145	315	460	303
	R 24	135	122			R 38	345	311			R 27	145	315	460	303
	R 16	135	122			R 24	345	311			R 28	140	315	455	298
	R 36	130	117			R 31	345	311			R 29	150	290	440	295
6	R 10	130	117	114	6	R 30	335	302	290		R 30	125	335	460	293
	R 32	130	117			R 37	335	302			R 31	120	345	465	293
	R 25	125	113			R 33	335	302			R 32	130	315	445	288
	R 30	125	113			R 28	315	284			R 33	120	335	455	288
	R 22	125	113			R 46	315	284		4	R 34	135	295	430	283
7	R 50	120	108	105		R 50	315	284			R 35	110	345	455	283
	R 31	120	108			R 26	315	284			R 36	130	300	430	280
	R 43	120	108			R 32	315	284			R 37	110	335	445	278
	R 33	120	108			R 27	315	284			R 38	105	345	450	278
	R 46	115	104		7	R 45	300	270	266		R 39	95	360	455	275
	R 49	115	104			R 36	300	270			R 40	135	275	410	273
	R 35	110	99			R 47	300	270			R 50	105	315	420	263
8	R 37	110	99	95		R 34	295	266			R 46	100	315	415	258
	R 44	110	99			R 52	290	261			R 43	120	275	395	258
	R 55	110	99			R 44	290	261			R 44	110	290	400	255
	R 50	105	95			R 29	290	261			R 45	105	300	405	255
	R 45	105	95		8	R 46	275	248	242	5	R 46	115	275	390	253
	R 38	105	95			R 48	275	248			R 47	90	300	390	240
	R 48	100	90			R 43	275	248			R 48	100	275	375	238
	R 46	100	90			R 51	275	248			R 49	115	240	355	235
9	R 53	95	86	80		R 40	275	248			R 50	120	225	345	233
	R 39	95	86			R 53	240	216			R 51	85	275	360	223
	R 47	90	81		9	R 49	240	216	208		R 52	75	290	365	220
	R 51	85	77			R 54	240	216			R 53	95	240	335	215
	R 54	85	77			R 57	225	203			R 54	85	240	325	205
	R 56	85	77			R 50	225	203			R 55	110	185	295	203
10	R 58	80	72	65		R 56	225	203			R 56	85	225	310	198
	R 59	80	72		10	R 55	185	167	146		R 57	75	225	300	188
	R 52	75	68			R 60	185	167		6	R 58	80	155	235	158
	R 57	75	68			R 58	155	140			R 59	80	125	205	143
	R 60	50	45			R 59	125	113			R 60	50	185	235	143

WM = working max, 1RM = tested one-repetition maximum, 90% = 90% 1RM, OHP = overhead press

TABLE 2. EXAMPLE TRAINING WEEK

Sunday	Rest
Monday	Full-body calisthenics and run intervals
Tuesday	Lower body strength/power, functional hypertrophy circuit
Wednesday	Swim intervals, water tread progression
Thursday	Upper body strength/power, functional hypertrophy circuit
Friday	Easy pace long run
Saturday	Rest

TABLE 3. STRENGTH, POWER, AND HYPERTROPHY PROGRESSION

WEEK	STRENGTH	POWER	HYPERTROPHY
1	3 x 10 at 60% WM	3 x 2 unloaded	2 x 15
2	4 x 8 at 70% WM	4 x 3 unloaded	2 x 12
3	5 x 5 at 80% WM	5 x 4 unloaded	2 x 10
4	5 x 3 at 85% WM	5 x 5 unloaded	2 x 8
5	5 x 2 at 87.5% WM	5 x 2 loaded	2 x 12
6	5 x 1 at 90% WM	5 x 3 loaded	2 x 10
7	Reduced effort: 3 x 5 at 60% WM	Reduced effort: 3 x 5 unloaded	Reduced effort: 2 x 8 reduced load
Working max (WM) = 90% true/estimated 1RM			

TABLE 4. EXERCISE EXAMPLES BY CIRCUIT STATION

SQUAT	VERTICAL PULL	HORIZONTAL PUSH	HINGE	HORIZONTAL PULL
Back squats	Pull-ups	Bench press	Deadlifts	Bent over rows
Front squats	Chin-ups	Floor press	Romanian deadlifts	Single-arm bent over rows
Unilateral kettlebell front rack squats	Commando chin-ups	Single-arm bench press/ floor Press	Single-leg Romanian deadlifts	Loaded inverted row
Goblet squats	Rope climb	Hex press	Kettlebell swings	Renegade rows
Split squats	Banded lat pulldowns	Loaded push-ups	Bulgarian goat bag swings	Banded face pulls
VERTICAL PUSH	**ROTATION**	**TRUNK ISOMETRICS**	**SKILL**	
Overhead press	Medicine ball rotational toss	Plank	Tourniquet application	
Push press	Medicine ball rotational push throw	Side plank	Basic first aid decision making and skills	
Push jerk	Landmine barbell rotation	Dead bug	Memory/recall	
Split-stance push press	Banded trunk rotation	Medicine ball bear hug march	Handcuffing	
Single-arm variations of all	Rotational ball slam	Suitcase march	Inert weapon manipulation	

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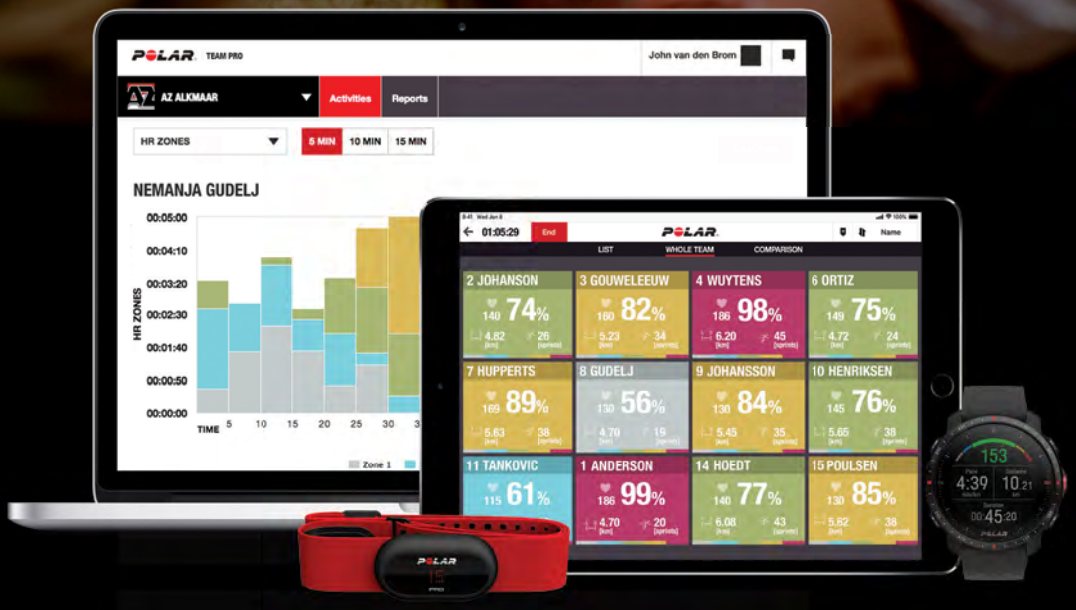

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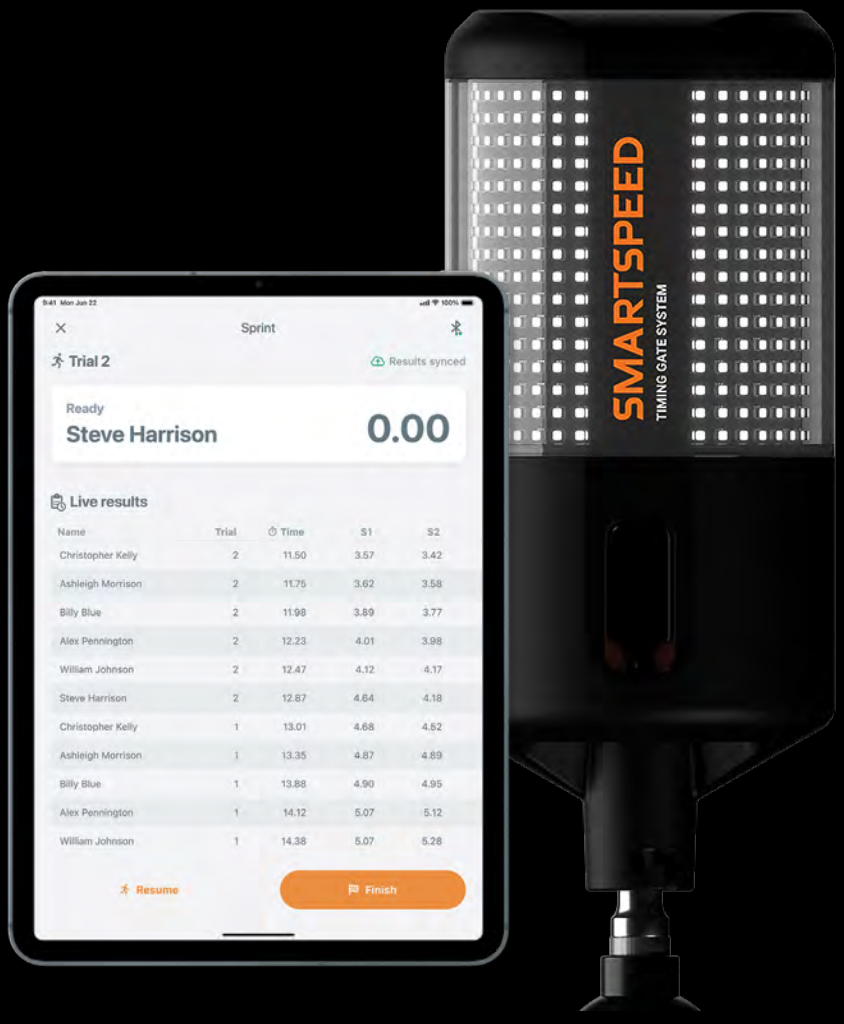

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