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ORIGINAL ARTICLE

MILITARY SKILLS OF FIREFIGHTERS IN CARDIOPULMONARY RESUSCITATION HABILIDADES DE MILITARES DO CORPO DE BOMBEIROS EM RESSUSCITAÇÃO CARDIOPULMONAR

HABILIDADES DE MILITARES DEL CUERPO DE BOMBEROS EN RESUCITACIÓN CARDIOPULMONAR

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ABSTRACT

Objective: to investigate the military's abilities of the Fire Department in Cardiopulmonary Resuscitation, Basic Life Support, in the adult, and with the use of the Automatic External Defibrillator. **Method:** quantitative, cross-sectional and descriptive study, with operational military of the Fire Department of a company in the interior of Minas Gerais, totaling 23 participants. The military was invited to perform a Cardiopulmonary Resuscitation on a medium fidelity manikin, and for this data collection, the Systematic Observation Roadmap, based on the 2015 guidelines of the American Heart Association, was applied. Data were analyzed using descriptive statistics. **Results:** Gaps in skills were shown in the stages of Cardiopulmonary Resuscitation in External Thoracic Compressions, ventilation, defibrillation and activation of the Advanced Service. **Conclusion:** it is recommended the re-evaluation and continuous training to adapt the skills of the Fire Brigade's military, contributing to minimize morbidity and mortality in cases of Cardiorespiratory Arrest. **Descriptors:** Cardiopulmonary Resuscitation; Basic life support; Firefighter.

RESUMO

Objetivo: investigar as habilidades de militares do Corpo de Bombeiros na Ressuscitação Cardiopulmonar, em Suporte Básico de Vida no adulto, e com o uso do Desfibrilador Externo Automático. **Método:** estudo quantitativo, transversal e descritivo, com militares operacionais do Corpo de Bombeiros de uma companhia no interior de Minas Gerais, totalizando 23 participantes. Os militares foram convidados a executar uma Ressuscitação Cardiopulmonar num manequim de média fidelidade, sendo neste momento, para a coleta de dados, aplicado o Roteiro de Observação Sistemática, baseado nas diretrizes de 2015 da *American Heart Association*. Os dados foram analisados por meio de estatística descritiva. **Resultados:** foram evidenciadas lacunas nas habilidades acerca das etapas da Ressuscitação Cardiopulmonar em Compressões Torácicas Externa, ventilação, desfibrilação e acionamento do Serviço Avançado. **Conclusão:** recomendam-se a reavaliação e a capacitação contínuas para a adequação das habilidades dos militares do Corpo de Bombeiros, contribuindo para minimizar a morbimortalidade em casos de Parada Cardiorrespiratória. **Descritores:** Ressuscitação Cardiopulmonar; Suporte Básico de Vida; Bombeiro.

RESUMEN

Objetivo: investigar las habilidades de militares del Cuerpo de Bomberos en la Resucitación Cardiopulmonar, en Soporte Básico de Vida, en el adulto, y con el uso del Desfibrilador Externo Automático. **Método:** estudio cuantitativo, transversal y descriptivo, con militares operacionales del Cuerpo de Bomberos de una compañía en el interior de Minas Gerais, totalizando 23 participantes. Los militares fueron invitados a ejecutar una Resucitación Cardiopulmonar en un maniquí de media fidelidad, siendo en este momento, para la recolección de datos, aplicado la Hoja de Observación Sistemática, basado en las directrices de 2015 de la *American Heart Association*. Los datos fueron analizados por medio de estadística descriptiva. **Resultados:** se evidenció lagunas en las habilidades acerca de las etapas de la Resucitación Cardiopulmonar en Compresiones Torácicas Externa, ventilación, desfibrilación y accionamiento del Servicio Avanzado. **Conclusión:** se recomienda la reevaluación y la capacitación continuas para la adecuación de las habilidades de los militares del Cuerpo de Bomberos, contribuyendo a minimizar la morbimortalidad en casos de Parada Cardiorrespiratoria. **Descriptor:** Resucitación Cardiopulmonar; Soporte Vital Básico; Bombero.

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INTRODUCTION

For the Military Fire Brigade (MFB), the performance, based on scientific criteria, of Cardiopulmonary Resuscitation (CPR) in Basic Life Support (BLS) in adults and with the use of Automatic External Defibrillator (AED) is an event of great importance inside care and assistance given to the victim of Cardiorespiratory Arrest(CRA), a situation in which it requires knowledge and skills to provide excellent care, increasing the possibility of reversal of CRA with minimization of morbidity and mortality.

There are few publications on this subject and, with the questioning whether the MFB is performing the maneuvers according to the latest international guidelines published in 2015 by the American Heart Association (AHA), the interest arose in carrying out this study.

It is worth noting that the relevance of this study is to investigate the MFB's abilities on CPR, seeking to elucidate the questioning raised, making it possible to identify gaps and favoring the possibility of improvements in the actions performed in the CPR by this group of professionals.

CRA is defined as sudden absence of spontaneous ventilation and pulse in large arteries, accompanied by loss of consciousness in the same individual at the same time.¹

CPR can be considered the set of maneuvers performed soon after a CRA, with the objective of artificially maintaining the arterial flow to the brain and other vital organs until the return of the spontaneous circulation occurs.²

BLS is to perform CRA recognition and implementation of immediate and effective measures for reversion of respiratory and cardiovascular collapse.³

Brazil has as a challenge to optimize the learning about CPR, aiming at effective actions in the first minute of the CRA.⁴

To be successful in the care of victims, MFB professionals must be trained both to identify a CRA and to adequately perform, based on the current protocols, the CPR maneuvers, ensuring successful delivery.⁵ Since the effectiveness of CPR depends training and constant updates.²

In this context, the objective of this study was to investigate the military abilities of the Fire Department in Cardiopulmonary Resuscitation, in Basic Life Support, in the adult and with the use of the Automatic External Defibrillator.

METHOD

A quantitative, cross-sectional and descriptive study carried out at the MFB Company, composed of 41 soldiers, in a city in the interior of Minas Gerais (MG). Twenty-three military personnel participated in the study, since they were included in the operational level and excluded from activities due to vacations and medical leave.

The instrument for data collection consisted of two parts: Systematic Observation Roadmap, indicated for controlled conditions with the purpose of answering pre-established purposes, 6 based on the AHA CRA algorithm in adults for BLS Health professionals - Update of 2015, 7, considering: CRA recognition, frequency / depth / location of External Thoracic Compression (CTE), bag-mask ventilation, AED defibrillation and Advanced Support (SAV) activation; and form for characterization of participants.

Before conducting the training with the MFB, a pre-test for validation of the instruments was carried out, applied to students of the first period of the Nursing course of the University of the State of Minas Gerais (UEMG) - Passos Unit, since these are considered laymen within the topic addressed and, theoretically, at the same level as the population studied. Possibility of adjustments were identified and realized, guaranteeing improvements and optimization of the applied instruments.

The equipment used was: Full-body, full-length, full-length mannequin (176 cm), with airway opening (VVAA), chest compression, artificial respiration, accompanied by a display that provides procedural parameters with report issuance at the end of the maneuver, natural resistance during the CTE, electronic pulse of the carotid artery and anatomical orientation points; AED simulator for training, a model indicated for Medical and Nursing schools and characterized as an ideal tool for students to be familiar with the BLS process and with the use of AED; Bag-valve-mask for adult; Torpedo of Oxygen and Equipment of Individual Protection (EPI): masks, gloves and goggles.

The researchers were trained by the professor responsible for the Emergency and First Aid disciplines of the UEMG - Passos Unit, prior to the data collection.

After the approval of the Ethics Committee in Research (CEP), the Foundation for Higher Education of Steps (FESP), Opinion number 1,789,118 (CAAE: 56326416.0.0000.5112), data were collected. Participants were

divided into four groups, according to the scale of work, as requested by the Lieutenant in charge.

The scheduled dates were May 10th to 13th, 2016. At which time the military were received in a room of the Company of the MFB. Exposed the objective of the research, an invitation was made to participate in it. Those who accepted it were asked to sign the Informed Consent Form (TCLE) and applied the questionnaire to characterize the participant.

The soldiers were individually invited in an isolated room to demonstrate in a simulated

manner the attendance to a CRA using the manikin and other equipment when, the Skeptical Observation Roadmap was applied.

The obtained data were organized and inserted in spreadsheets in Microsoft Excel, being analyzed through descriptive statistics, focusing on absolute and relative frequency. Subsequently, they were exposed in tables to show the results.

RESULTS

According to the data collected, the characteristics of the participants, stand out (Table 1):

Table 1. Distribution of MFB relative to the position, time of operation in the corporation, schooling, age, update and safety in CPR. Passos (MG), Brazil, 2016.

Variables	n	%
Office		
Soldier	8	34.8
Corporal	5	21.7
Sergeant	9	39.15
Deputy	1	4.35
Total	23	100
Time in the corporation		
<5 years	6	26.1
5 - 12 years	5	21.7
13 - 20 years	5	21.7
21 - 25 years	4	17.4
> 25 years	3	13.1
Total	23	100
Education		
High school	17	73.9
Higher education	6	26.1
Total	23	100
Age		
18 - 29 years old	9	39.1
30 - 39 years	4	17.45
40 - 49 years	9	39.1
50 or more	1	4.35
Total	23	100
CPR update course		
Yes	8	34.8
No	15	65.2
Total	23	100
Safety in CPR		
Yes	20	86.9
No	3	13.1
Total	23	100

It was found that nine (39.15%) participants of the MFB sample was a sergeant; six (26.1%) with a duration of less than or equal to five years; 17 (73.9%) had a high school education; nine (39.15%) aged 18-29 years and, in the same proportion, of 40-49 years.

Regarding the completion of courses in CPR, 15 (65.2%) reported not having received an update after initial training, but, 20 (86.9%) considered it safe to perform CPR maneuvers.

In the Systematic Observation Roadmap, constructed according to the AHA of CRA algorithm in adults for BLS Health professionals - 2015 Update with the objective of evaluating the participants' abilities regarding recognition of CRA, frequency / depth / location of the CTE, bag-valve-mask ventilation, AED defibrillation and SAV activation, the results obtained are highlighted in table 2 below.

Table 2. Distribution of MFB regarding assertiveness in the recognition of CRA and respiration, external chest compression, VVAA permeabilization, ventilation, defibrillation and triggering of VAS in CPR. Passos (MG), Brazil, 2016.

Variables	Correct		Incorrect		Total	
	n	%	n	%	n	%
CRA Recognition						
Responsiveness	22	95.65	1	4.35	23	100
Pulse and Breathing	21	91.3	2	8.7	23	100
External Thoracic Compression						
Frequency	4	17.4	19	82.6	23	100
Depth	22	95.65	1	4.35	23	100
Local	21	91.3	2	8.7	23	100
Ventilation with Bag-Valve-Mask	13	56.5	10	43.5	23	100
Defibrillation with AED						
Action on equipment arrival	14	61.85	9	38.15	23	100
Action on equipment installation	9	38.15	14	61.85	23	100
Action after evaluation by the equipment	14	61.85	9	38.15	23	100
SAV activation	10	43.5	13	56.5	23	100

Regarding the recognition of CRA, the majority proceeded correctly in the evaluation of this item; 22 (95.65%) in the evaluation of responsiveness and 21 (91.3%) in the evaluation of breathing and pulse.

In the CTEs, 22 (95.65%) participants correctly demonstrated the depth; 21 (91.3%), the site, but in contrast, only four (17.4%) correctly, demonstrated the frequency.

The skills regarding venting with bag-valve-mask, ten (43.5%) performed it inadequately.

In the assessment of skills regarding defibrillation with the AED, the evaluation was performed on arrival, installation and, after evaluation by the equipment, and 14 (61.85%) acted correctly upon arrival and action after evaluation of the equipment. Only nine (38.15%) did not interrupt the compressions to install the AED blades.

Regarding the activation of the SAV, 13 (56.5%) performed incorrectly, the demonstration of the attendance to a CRA by MFB.

DISCUSSION

The Adult CRA Algorithm for Health Professionals of BLS - AHA 2015 Update states that the identification of CRA is to evaluate responsiveness and, immediately thereafter, to evaluate the heart rate and respiration simultaneously, not exceeding 10 seconds. In the CTE a minimum frequency of 100 and maximum of 120 / min, minimum depth of five and maximum of six centimeters and in the lower third of the sternum should be maintained; ventilation with bag-valve-mask should be two insufflations every 30 CTEs; AED defibrillation is indicated immediately upon arrival of equipment; install blades, without interrupting compressions, and resume CPR after shock and / or heart rate assessment by the equipment; and the VAS should be triggered immediately after CRA identification.⁷

The International Liaison Committee on Resuscitation (ILCOR), an AHA representative, cites the importance of training in CPR and emphasizes that it should be tailored to the target audience in different modalities, offering alternative means of teaching, in order to guarantee the acquisition and retention of knowledge and skills in the CRA care.⁸

The characteristics of the MFB that participated in this research, compared to the existing literature, show: study reveals equality of proportion in the function of sergeant; divergences in time working at the corporation; predominance of function between 10-14 years; schooling in complete higher education adn age between 20-30 years. ⁹ The study showed a predominance of up to five years of activity in the MBC (26.1%), and the prevalence in the university was 10% (73.9%) and age between 18-29 and 40-49 (39.1% in each group).

Table 1 shows that 65.2% (n = 15) did not receive refresher course in CPR after initial training. Given this, we emphasize that MFB must provide a quality service, being linked to the constant updating of procedures and the training of the teams, seeking the scientific basis necessary to guide the daily actions. It is always necessary to verify if the theoretical teachings are in line with the practice.⁴ Updating in BLS is inextricable, since knowing and knowing how to perform the CPR maneuvers by adopting the CRA service protocol, based on the AHA guidelines, bases the excellence of the performed.

CPR training is indicated at least every three to six months to avoid deterioration of skills and knowledge⁵ and encouragement for studies examining CPR skills with the aim of identifying variables and improving quality and skills.¹³

The training strategy on CPR is considered relevant for the achievement of better results

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in CRA care.^{14,15} There is a need for the implementation and encouragement of continuing education on this subject to reduce morbidity related to CRA / CPR.¹⁶

It is identified as a favorable factor for the CRA survival outcome that the collapse is witnessed by professionals trained in BLS, demonstrating the importance of well-organized, structured and well-trained prehospital care services.¹⁷

In the data obtained and demonstrated in table 2, we verified that the skills in CTE, bag-valve-mask ventilation, AED defibrillation and SAV activation, were inadequate. Only the identification of the victim in CRA obtained high rates of assertiveness.

The literature shows that 100% had knowledge about the frequency of chest compressions in a study with MBC, 6 different from that found in this study, because in relation to the depth of the CTE, only 17.4% demonstrated abilities in this aspect. In this research, it was possible to observe an inverse result to that found in the literature: greater assertiveness in depth and lower frequency of CTEs.

A study that addressed bag-valve-mask ventilation in the CRA showed that the participants showed a low index of knowledge when asked about this stage of CPR.¹⁸

Regarding defibrillation with the AED, a deficit in abilities was observed, different from a study performed that showed that the participants demonstrated knowledge regarding the actions related to the management of the AED.¹⁸ The AHA emphasizes the importance of early defibrillation to achieve better CPR results.⁷

In the results obtained in this research, ten (43.5%) participants demonstrated abilities in relation to VAS activation, a higher percentage than that found in another study⁴, also performed with MFB, which showed only 23% of assertiveness in this stage of CPR.

The presence of VAS in the CPR is indispensable so that invasive and medicinal measures can be performed to allow the reversion of the non-achieved CRA with the measures implemented in the BLS.

Survival in CRA remains a crucial component of the quality of CPR¹⁹, and although some practitioners never perform CPR in practice, they must have the basic skills to perform it properly.²⁰

The limitations with the greatest impact, in this study, were the lack of research that allowed for optimization of the comparisons with the results obtained and the validation of the data collection instrument (Systematic

Observation Roadmap) by experts in the area of Emergency and / or CPR.

CONCLUSION

When analyzing the data obtained, it was possible to analyze the characteristics and skills in CPR in BLS in adults with the use of AED by the MBC of a city in the interior of Minas Gerais.

It was identified that the majority was a sergeant, with military time of less than or equal to five years, age between 18-29 and 40-49 years old, high school education, no CPR update course and referring to having security to act in the CRA.

Skills show deficiency at all stages, except for recognition of CRA. We emphasize that only 17.4% demonstrated abilities in the frequency of CTEs; 38.15%; in the AED installation and 43.5%, in the activation of the VAS.

We emphasize that there are few MFB versus CPR publications according to international guidelines, a limiting fact that assumes that there is inference in the data discussion. In this context, it is necessary to promote studies and publications on this subject.

Through this study, we verified that it is indispensable to invest training in MFB teams, allowing better results in the care of the victim in CRA, since the skills identified in this study are deficient and can certainly determine the result of CPR, contributing to minimize morbidity and mortality in the victims of CRA.

REFERÊNCIAS

1. Delfino MFNS, Duarte AML, Santos YR, Lima DPB, Brasileiro M. Nível de conhecimento técnico científico do enfermeiro sobre as novas diretrizes de reanimação cardiopulmonar. Rev cient esc estadual saúde pública de Goiás Cândido Santiago [Internet]. 2015 [cited 2016 Jan 12];1(1):13-32. Available from: <http://www.resap.net.br/index.php/numeros-antteriores/8-resap-vol-001-ano-2015/3-artigo-002>
2. Guimarães MR, Moreira LH, Oliveira RHLGO, Magalhães SR. Revisão de Literatura: Reanimação Cardiopulmonar. Rev inic cient univ vale rio verde [Internet]. 2015 [cited 2016 Jan 10]; 5(1):3-12. Available from: <http://periodicos.unincor.br/index.php/inicia-caocientifica/article/view/2359>
3. Perkins GD, Travers AH, Berg RA, Castren M, Considine J, Escalante R, et al. Part 3: Adult basic life support and automated external defibrillation__2015 International

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Military skills of firefighters in cardiopulmonary...

Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation [Internet]. 2015 [cited 2017 Apr 29];95:43-69. Available from: <https://dx.doi.org/>

<http://dx.doi.org/10.1016/j.resuscitation.2015.07.041>

4. Gonzalez MMC, Timerman S, Oliveira RG, Polastri TF, Dallan LAP, Araújo S, et al. I Diretriz de Ressuscitação Cardiopulmonar e Cuidados Cardiovasculares de Emergência da Sociedade Brasileira de Cardiologia: Resumo Executivo. Arq bras cardiol [Internet]. 2013 [cited 2016 Jan 10]; 100(2). Available from: http://publicacoes.cardiol.br/consenso/2013/Diretriz_Emergencia.pdf

5. Sá EF, Souza MNA, Bezerra ALD, Feitosa AAN, Almeida EUA. Parada cardiorrespiratória: conhecimento dos profissionais do corpo de bombeiros no atendimento pré-hospitalar. Rev interd saúde [Internet]. 2014 [cited 2016 Feb 08];1(2):212-26. Available from: http://www.interdisciplinaremsaude.com.br/Volume_2/Trabalho_4.pdf

6. Polit DF, Beck CT. Fundamentos da pesquisa em enfermagem: avaliação de evidências para a prática de enfermagem. 7th ed. Porto Alegre: ArtMed; 2011.

7. AHA. American Heart Association. Destaques da AHA 2015: Atualização das Diretrizes de RCP e ACE [Internet]. 2015 [cited 2016 Feb 12]. Available from: <https://eccguidelines.heart.org/wp-content/uploads/2015/10/2015-AHA-Guidelines-Highlights-Portuguese.pdf>.

8. Greif R, Lockey AS, Conaghan P, Lippert A, Vries W, Monsieurs KG, et al. European Resuscitation Concil Guidelines for Resuscitation 2015. Section 10. Education and implementation of resuscitation. Resuscitation [Internet]. 2015 [cited 2016 Feb 13];95:288-301. Available from: <https://dx.doi.org/10.1016/j.resuscitation.2015.07.032>

9. Neto TS, Neto JLC, Pinto MP. Estresse e níveis de atividade física de Bombeiros Militares de Alagoas, Brasil. R bras qual vida [Internet] 2014 [cited 2016 Mar 16];6(4):250-60. Available from: <https://dx.doi.org/10.3895/S2175-08582014000400006>

10. Iserbyt P, Theys L, Ward P, Charlier N. The effect of a specialized content knowledge workshop on teaching and learning Basic Life Support in elementary school: A cluster randomized controlled trial. Resuscitation [Internet]. 2017 [cited 2017 Apr 29];112:17-21. Available from:

<http://dx.doi.org/10.1016/j.resuscitation.2016.11.023>

11. Bhanji F, Finn JC, Lockey A, Monsieurs K, Frengley R, Iwami T, et al. Part 8: education, implementation, and teams: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation [Internet]. 2015 [cited 2017 Apr 29];132(16):242-68. Available from: <http://dx.doi.org/10.1161/CIR.0000000000000277>

12. Toubasi S, Alosta MR, Darawad MW, Demeh W. Impact of simulation training on Jordanian nurses performance of basic life support skills: A pilot study. Nurse educ today [Internet]. 2015 [cited 2016 Mar 01]; 35(9):999-1003. Available from: <http://dx.doi.org/10.1016/j.nedt.2015.03.017>

13. Oermann MH, Edgren SEK, Maryon TO, Roberts CJ. Effects of Practice on Competency In Single Rescuer Cardiopulmonary. Medsurg nurs [Internet]. 2014 [cited 2016 Jan 10];23(1):22-8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24707665>

14. Hansen CM, Rosenkranz SM, Folke F, Zinckernagel L, Tjørnhøj-Thomsen T, Torp-Pedersen C, et al. Lay Bystanders' Perspectives on What Facilitates Cardiopulmonary Resuscitation and Use of Automated External Defibrillators in Real Cardiac Arrests. J am heart assoc [Internet]. 2017 [cited 2017 Apr 29]; 6(3). Available from: <http://dx.doi.org/10.1161/JAHA.116.004572>

15. Schmid KM, Mould-Millman N, Hammes A, Kroehl M, Garcia RQ, McDermott MV, et al. Barriers and Facilitators to Community CPR Education in San José, Costa Rica. Prehosp disaster med [Internet]. 2016 [cited 2017 Apr 29];31(5):[about 5 p.] Available from: <http://dx.doi.org/10.1017/S1049023X1600077>

16. Lisboa NS, Borges MS, Monteiro OS. Assessment of the knowledge of nurses on post-cardiopulmonary arrest care. J Nurs UFPE on line [Internet]. 2016 Oct [cited 2017 Apr 29];10(10):3778-86. Available from: <http://www.revista.ufpe.br/revistaenfermage/index.php/revista/article/viewArticle/7473>

17. Morais DA, Carvalho DV, Correa AR. Parada cardíaca extra-hospitalar: fatores determinantes da sobrevida imediata após manobras de ressuscitação cardiopulmonar. Rev Latinoam Enferm [Internet]. 2014 [cited 2016 July

Alves MG, Silva MC da, Bueno SJS et al.

Military skills of firefighters in cardiopulmonary...

12];22(4):562-8. Available from:
<http://dx.doi.org/10.1590/0104-1169.3453.2452>

18. Dixe MACR, Gomes JCR. Conhecimento Da População Portuguesa Sobre Suporte Básico De Vida e Disponibilidade Para Realizar Formação. Rev esc enferm USP [Internet]. 2015 [cited 2016 Feb 13];49(4):640-9. Available from:
<http://dx.doi.org/10.1590/S0080-623420150000400015>

19. Abella BS. High-quality cardiopulmonary resuscitation: current and future directions. Curr opin crit care [Internet]. 2016 [cited 2016 Sept 12]; 22(3):218-224. Available from:
<http://dx.doi.org/10.1097/MCC.0000000000000296>

20. Everett-Thomas R, Yero-Aguayo M, Valdes B, Valdes G, Shekhter I, Rosen LF, et al. An assessment of CPR skills using simulation: Are first responder prepared to save lives? Nurse educ pract [Internet]. 2016 [cited 2016 Sept 10];19:58-62. Available from:
<http://dx.doi.org/10.1016/j.nepr.2016.05.003>

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