Description Clear colourless or very faintly yellow liquid; odour, almost odourless or of the antimicrobial agent.

Expiration date; Warning; Labelling See under *Diphtheria Antitoxin*, page 1438.

Identification Specifically neutralizes the alpha toxin of *Clostridium perfringens* making it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Not less than 1500 IU per ml, determined by the "Biological Assay of Gas-gangrene Antitoxin (Perfringens)" (Appendix 15.2.3).

Usual dose Prophylactic: *intramuscular* or *intravenous*, 10,000 IU.
Therapeutic: *intramuscular* or *intravenous*, not less than 30,000 IU.

GAS-GANGRENE ANTITOXIN (SEPTICUM)

Category Passive immunizing agent.

Gas-gangrene Antitoxin (Septicum) is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the alpha toxin formed by *Clostridium septicum*.

The antitoxin complies with the requirements stated under Antisera, with the following modifications.

Description Clear, colourless or very faintly yellow liquid; odour, almost odourless or of the antimicrobial agent.

Expiration date; Warning; Labelling See under *Diphtheria Antitoxin*, page 1438.

Identification Specifically neutralizes the alpha toxin of *Clostridium septicum* making it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Not less than 1500 IU per ml, determined by the "Biological Assay of Gas-gangrene Antitoxin (Septicum)" (Appendix 15.2.4).

Usual dose Prophylactic: *intramuscular* or *intravenous*, 5000 IU.
Therapeutic: *intramuscular* or *intravenous*, not less than 15,000 IU.

MIXED GAS-GANGRENE ANTITOXIN

Category Passive immunizing agent.

Mixed Gas-gangrene Antitoxin is prepared by mixing Gas-gangrene Antitoxin (Oedematiens), Gas-gangrene Antitoxin (Perfringens) and Gas-gangrene Antitoxin (Septicum) in appropriate quantities.

The antitoxin complies with the requirements stated under Antisera, with the following modifications.

Description Clear, colourless or very faintly yellow liquid; odour, almost odourless or of the antimicrobial agent.

Expiration date; Warning; Labelling See under *Diphtheria Antitoxin*, page 1438.

Identification Specifically neutralizes the alpha toxin of *Clostridium oedematiens*, *Clostridium perfringens* and *Clostridium septicum* making it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Gas-gangrene Antitoxin (Oedematiens), not less than 1000 IU per ml; Gas-gangrene Antitoxin (Perfringens), not less than 1000 IU per ml; Gas-gangrene Antitoxin (Septicum), not less than 500 IU per ml. Determine the potency by the biological assay for each component (Appendices 15.2.2, 15.2.3 and 15.2.4).

Usual dose *Intravenous* or *intramuscular*:

	Prophylactic (IU)	Therapeutic (IU)
Gas-gangrene Antitoxin (Oedematiens)	10,000	not less than 30,000
Gas-gangrene Antitoxin (Perfringens)	10,000	not less than 30,000
Gas-gangrene Antitoxin (Septicum)	5,000	not less than 15,000

TETANUS ANTITOXIN

Category Passive immunizing agent.

Tetanus Antitoxin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the toxin formed by *Clostridium tetani*.

The antitoxin complies with the requirements stated under Antisera, with the following modifications.

Description Transparent or slightly opalescent, faint brownish or yellowish or greenish liquid; odour, practically odourless or of the antimicrobial agent.

Expiration date; Warning; Labelling See under *Diphtheria Antitoxin*, page 1438.

Identification Specifically neutralizes the toxin of *Clostridium tetani* making it harmless to susceptible animals. The potency test may serve as an identification test.

Potency For prophylactic use, not less than 1000 IU per ml; for therapeutic use, not less than 3000 IU per ml, determined by the "Biological Assay of Tetanus Antitoxin" (Appendix 15.2.5).

Usual dose Prophylactic: *subcutaneous* or *intramuscular*, not less than 1500 IU.
Therapeutic: *intramuscular* or *intravenous*, not less than 10,000 IU.

RABIES ANTISERUM

Category Passive immunizing agent.

Rabies Antiserum is a preparation containing the specific antiviral globulins from immunized animals. It has the power of neutralizing rabies virus.

The antiserum complies with the requirements stated under Antisera, with the following modifications.

Description Transparent or slightly opalescent faint brownish, yellowish or greenish liquid; odour, practically odourless or of the antimicrobial agent.

Expiration date; Warning; Labelling See under *Diphtheria Antitoxin*, page 1438.

Identification Specifically neutralizes the rabies virus making it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Not less than 80 IU per ml, determined by the "Biological Assay of Rabies Antiserum" (Appendix 15.2.6).

Usual dose Rabies Antiserum should be given as soon as possible after exposure, preferably within 24 hours. An intramuscular injection of 40 IU of rabies antiserum per kg of body-weight is given. If possible, part of the dose should be infiltrated around the wound, the remainder being injected intramuscularly. Active immunization should be started immediately after rabies antiserum has been given.

BANDED KRAIT ANTIVENIN

Category Passive immunizing agent.

Banded Krait Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the banded krait (*Bungarus fasciatus* Schneider) venom.

The antivenin complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid, light cream in colour.

Expiration date; Warning; Labelling See under *Cobra Antivenin*, page 1440.

Identification Specifically neutralizes the banded krait venom, rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the banded krait venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7); use the banded krait test venom for determining its capacity to neutralize the lethal effect.

Usual dose Fluid or freeze-dried Banded Krait Antivenin (after reconstitution by accompanying diluent) should be injected intravenously or along with normal saline as soon as possible. Doses of 10 to 20 ml are sufficient for a mild case of snakebite poisoning. Larger doses are required for moderate and severe cases as indicated by the severity of the symptoms. During the observation period, subsequent doses are to be given if symptoms persist.

COBRA ANTIVENIN

Naja Antivenin

Category Passive immunizing agent.

Cobra Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the cobra (*Naja naja kaouthia* Lesson) venom.

The antivenin, reconstituted if necessary as stated on the label, complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown

transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid, light cream in colour.

Expiration date When stored under the prescribed conditions, the expiration date is not later than 3 years for liquid products with an excess of 5 to 10 per cent of antibody and is not later than 5 years with an excess of 20 per cent.

With dried products expiration dates have been allowed of up to 5 years with an excess of 10 per cent antibody.

Warning Reactions to Cobra Antivenin are unfortunately common and often severe. In sensitized persons the administration of a heterologous serum may trigger an anaphylactic reaction. Therefore, it is recommended to take a precise anamnesis and to perform an intradermal test in every case (eventually to begin with a high serum dilution). Before the application of a heterologous serum all the preparations for the treatment of cardiovascular and respiratory complications which may accompany such anaphylactic reactions have to be made. A few days after the injection of a heterologous serum, serum sickness may also occur.

Labelling Complies with the "General Information for Biological Products", page 1416. In addition the label on the container states (1) the number in mg of reference cobra venom neutralized by a specified quantity of the antivenin; (2) the recommended human dose; (3) the major precautions to be employed in administering animal serum; (4) the animal source of the preparation; (5) the nature and volume of the solvent to be used for recon-stitution; (6) the nature of the preparation, e.g., natural serum or purified immunoglobulin or treated immuno globulin and, if purified or treated, the nature of the process.

Identification Specifically neutralizes the cobra venom, rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the cobra venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7).

Usual dose Cobra Antivenin should be injected intravenously or along with normal saline as soon as possible. Doses of 10 to 20 ml are sufficient for a mild case of snakebite poisoning. Larger doses are required for moderate and severe cases as indicated by severity of the symptom. During the observation period, subsequent doses are to be given if symptoms persist.

GREEN PIT VIPER ANTIVENIN

Category Passive immunizing agent.

Green Pit Viper Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the green pit viper (*Trimeresurus albolabris* Gray, *T. erythrurus* Cantor, *T. popeorum* M. Smith, or other species of *Trimeresurus*) venom.

The antivenin, reconstituted if necessary as stated on the label, complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid, light cream in colour.

Expiration date; Warning; Labelling See under *Cobra Antivenin*, page 1440.

Identification Specifically neutralizes the green pit viper venom,rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the green pit viper venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7); use the green pit viper test venom for determining its capacity to neutralize the lethal effect.

Usual dose Green Pit Viper Antivenin should be injected intravenously or along with normal saline as soon as possible. Doses of 10 to 20 ml are sufficient for a mild case of snakebite poisoning. Larger doses are required for moderate and severe cases as indicated by the severity of the symptoms. During the observation period, subsequent doses are to be given if symptoms persist.

KING COBRA ANTIVENIN

Category Passive immunizing agent.

King Cobra Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the king cobra (*Ophiophagus hannah* Cantor) venom.

The antivenin, reconstituted if necessary as stated on the label, complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid; light cream in colour.

Expiration date; Warning; Labelling See under *Cobra Antivenin*, page 1440.

Identification Specifically neutralizes the king cobra venom, rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the king cobra venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7); use the king cobra test venom for determining its capacity to neutralize the lethal effect.

Usual dose Fluid or freeze-dried King Cobra Antivenin (after reconstitution by accompanying diluent) should be injected intravenously or along with normal saline as soon as possible. Doses of 10 to 20 ml are sufficient for a mild case of snakebite poisoning. Larger doses are required for moderate and severe cases as indicated by the severity of the symptoms. During the observation period, subsequent doses are to be given if symptoms persist.

MALAYAN PIT VIPER ANTIVENIN

Category Passive immunizing agent.

Malayan Pit Viper Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the Malayan pit viper (*Agkistrodon rhodostoma* Boie) venom.

The antivenin, reconstituted if necessary as stated on the label, complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid; light cream in colour.

Expiration date; Warning; Labelling See under *Cobra Antivenin*, page 1440.

Identification Specifically neutralizes the Malayan pit viper venom, rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the Malayan pit viper venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7); use the Malayan pit viper test venom for determining its capacity to neutralize the lethal effect.

Usual dose Malayan Pit Viper Antivenin should be injected intraveneously or along with normal saline as soon as possible. Doses of 10 to 20 ml are sufficient for a mild case of snakebite poisoning. Larger doses are required for moderate and severe cases as indicated by the severity of the symptoms. During the observation period, subsequent doses are to be given if symptoms persist.

RUSSELL'S VIPER ANTIVENIN
(*Vipera russelli*)

Category Passive immunizing agent.

Russell's Viper Antivenin is a preparation containing the specific antitoxic globulins from immunized animals. It has the power of neutralizing the Russell's viper (*Vipera russelli siamensis* M. Smith) venom.

The antivenin, reconstituted if necessary as stated on the label, complies with the requirements stated under Antisera, with the following modifications.

Description Colourless or slightly yellowish brown transparent liquid. Dried antivenin consists of solid exhibiting the characteristic structure of a freeze-dried solid; light cream in colour.

Expiration date; Warning; Labelling See under *Cobra Antivenin*, page 1440.

Identification Specifically neutralizes the Russell's viper venom, rendering it harmless to susceptible animals. The potency test may serve as an identification test.

Potency Contains, in each ml, sufficient antitoxic globulins to neutralize the amount of the Russell's viper venom stated on the label when determined by the "Biological Assay of Cobra Antivenin" (Appendix 15.2.7); use the Russell's viper test venom for determining its capacity to neutralize the lethal effect.

資料 4：タイ国生物学的製剤基準

Minimum requirements for Biological Products

ข้อกำหนดชีววัตถุ เล่ม ๑

พ.ศ. ๒๕๔๑

Minimum Requirements for Biological Products Volume I

1998

กระทรวงสาธารณสุข

MINISTRY OF PUBLIC HEALTH

THAILAND

ISBN 974-291-442-7

GENERAL INFORMATION

The biological products referred to in this book are products of biological origin whose potency and safety cannot be evaluated by chemical or physical tests alone. The testing of such products for potency and safety is therefore carried out by biological procedures requiring specialized knowledge and competence. These products may be of microbial origin or of animal or human origin. The biological products are distributed under aseptic conditions in sterile containers that are inert towards the contents and sealed so as to exclude contamination. Moreover special care must be taken to the handling and storage of these products. Due to the above reasons, the biological products have been separately grouped.

Subjected to other pertinent laws and ministerial regulations and notifications promulgated by Thai Minister of Public Health, the various standards of articles set up in this book, together with their requirements, are legally recognized by the Royal Thai Government. The Ministry of Public Health is responsible for approval of all biological products produced in Thailand.

Classification of Biological Products : Biological Products to be included in this book, are classified as follows:

- Vaccine
- Toxoid
- Antitoxin
- Snake antivenin
- Blood products

Containers : The containers, for example, ampoules, vials, bottles and syringes are the device that hold the substances. The closure of the container, including the stopper, the cap, the attached dropper, etc., is considered as a part of the container. Unless elsewhere specified, glass containers of Type I are used for each product and for reconstituting solution conforming to the specification given in Appendix II TP Vol I Part ๑. The containers should be colourless and translucent glass. They shall be sterilized and sealed by means of suitable closures so that the contamination of the contents is prevented.

They must, likewise, not interact physically or chemically with the substances which they hold so as to alter the latter quality, purity or therapeutic potency. The specification for containers should be approved by Ministry of Public Health.

Stability: The stability of biological products should be demonstrated to the satisfactory of the Ministry of Public Health. At least 3 consecutive batches of final bulk shall be treated to prove stability during storage.

Release and Certificate: Each lot of biological products should be released only if it fulfills requirements of each monograph. The statement must be signed by National Control Laboratory for Biological Products, Ministry of Public Health.

Contents of the Monographs: Each monograph usually specified the product according to the order given below:

1. Description
2. Production control
    - Control of source material
    - Control of final bulk
3. Control test on final product
4. Labelling
5. Storage and expiry date

Weights and Measure: Units for length, area, volume, weight, etc. are expressed by the following abbreviations: centimeter, cm; millimeter, mm; micrometer, μm; nanometer,nm; square centimeter, cm^2; milliliter, ml; microliter, μl; kilogram, kg; gram, g; milligram, mg; microgram, μg; nanogram, ng; picogram, pg; mercuriPal column in millimeter, mmHg (pressure); and centrifugal gravity, G.

Labelling: The label on the container shall show at least:

1. the name of the product;
2. the name and the address of the manufacturer;
3. the number of final lot;
4. the nature and amount of any substance used in the preparation of the

biological product likely to give rise to an adverse reaction in some reagents;

5. the recommended human dose and route of administration;

6. the condition of storage and expiry date;

7. the nature and amount of any preservative or added substance present in the product;

8. the source of the bulk material if it was not prepared by the producer of the final biological product;

9. any contraindications to the use of the product;

All finished products shall be clearly identified by labels. The area of the container should be left uncovered to allow inspection of the contents. If the final container is not suitable for labelling, it should be in a labelled package.

□□□□□□□□□□□□□□□

The Government Pharmaceutical Organization (GPO) is a state enterprise under the Ministry of Public Health, engaged in manufacturing an extensive range of pharmaceutical products.

Every year, over 300 different items are formulated in various dosage forms to serve the need of the Public Health Services.

HISTORY

GPO *was established in 1966 by the merging of the Government Pharmaceutical Laboratories (founded in 1941), a manufacturer, with the Division of Medical Depot (founded in 1901), distributor.*

Throughout these years, GPO has been continuing development in all areas: personnel training, new technology implementation, manufacturing and quality control. Consequently, GPO has been the leader in pharmaceutical industry and gained national recognition with high quality since its foundation.

GPO'S FUNCTIONS

GPO'S *main functions are as follows :*

1. *To produce medicinal products*
2. *To survey the indigenous raw materials and to investigate the possibility of developing bulk drug production utilizing local resources for the country's self-reliance*
3. *To supply good quality drugs at reasonable prices*
4. *To reserve stock to prevent shortage in case of emergencies or disasters*

GPO'S *duty is not only to serve the government's and country's health policies through being the unit which supply high quality pharmaceuticals, but also to provide the government with returns regularly.*

GPO'S MISSION

Our mission is to fulfill customers' need with consistently high quality products at a favourable cost, and to support the National Health's policies.

GPO'S POLICIES

1. *To support and provide household remedies in Primary Health Care*
2. *To provide essential medicines for public health services*
3. *To reserve stock in case of emergency shortage*
4. *To maintain price mechanism*
5. *To support and promote the production standard including quality control*
6. *To conduct and promote research and development in this field*
7. *To serve the government's and the Ministry of Public Health's policies*
8. *To encourage production of medicinal products from local herbal raw materials*

THE 8TH NATIONAL ECONOMIC & SOCIAL DEVELOPMENT PLAN (1997-2001)

The country's development for the 4 years is shaped under the 8th National Economic & Social Development Plan (1997-2001). The ultimate goal of the plan is to deal effectively with the challenges of social change.

The main objectives are as follows:

1. *To foster and develop the potential of all Thais, in terms of health, physical well-being, intellect, vocation skills and ability to adapt to changing social and economic conditions*
2. *To develop a stable society, strengthen family and community, support human development, improve quality of life and promote increasing community participation in national development*

3. *To promote stable and sustainable economic growth, and to empower the people to play a greater role in the development process and receive a fair share of the benefits of growth*
4. *To utilize, preserve and rehabilitate the environment and natural resources in such a way that they can play a major role in economic and social development and contribute to better qualily of life for the Thai people*
5. *To reform the system of public administration so as to allow greater participation of non-governmental organizations, the private sector, communities and the general public in the process of national development*

Ministry of Public Health is one of the five major ministries in charge of increasing the quality of lives of Thai people. GPO recognizes the importance of "Health for All". So we have campaigned for the above-mentioned purpose by not only producing primary medicines, conducting research and development but also taking part in joint venture with foreign pharmaceutical companies for the main purpose of up-to-standard medicines with a reasonable price. Besides, the international standardization is also the foremost standard we have implemented in order to increase our efficiency for the sake of Thais.

PRODUCTION

There are, now, four major areas being concentrated on and several others that are within the capability of GPO. Those four primary ones are as follows:

1. BIOLOGICALS

18 items of vaccines, toxoids and sera are produced: cholera vaccine, rabies vaccine, tetanus toxoid, pertussis vaccine, DTP vaccine antivenins, JE vaccine and etc.

2. HOUSEHOLD REMEDIES

23 items are produced, pharmacologically categorized as antacids, laxatives, purgatives, anthelmintics, antimalarials, analgesic-antipyretics, vitamins and etc.

3. PHARMACEUTICALS

228 items are produced in various dosage forms such as injections, tablets, mixtures, ointments and etc.

4. CHEMICALS

6 items of chemicals are produced for pharmaceutical and medicinal usage. Some items such as Sodium Chloride BP, Sodium Chloride USP, Aluminium Hydroxide Compressed Gel, etc., have been produced from local raw materials.

MARKETING SITUATION

One of the GPO's objectives is to maintain price mechanism of drugs in the market and keep control of cost while retaining high level of product quality. To survive in price competitive environment as well as to maintain this objective, GPO must have dynamic suitable marketing strategy to get enough revenue for self-support after paying returns to the government.

PRINCIPAL ROLES

1. PROMOTION

- *Advertising through various media, e.g., radio, television, billboard, printed material*
- *Sales promotion*
- *Personal selling*
- *Publicity, e.g., exhibition, seminar, workshop, symposium*

2. SALES ADMINISTRATION

- *Sales correspondence*
- *Credit control*
- *Invoicing*

3. DELIVERY

- *Delivery to more than 10,000 customers*

4. RETAIL SALES

- *With 6 retail drugstores aiming to covering most of Bangkok and adjoining areas*

5. REGIONAL DEPOT

To provide delivery service and to reduce cost in delivery, GPO has set up 3 regional depots in Udonthani, Chiengmai and Songkhla provinces which are in northeastern, northern and southern region respectively

QUALITY CONTROL

It is part of Good Manufacturing Practice (GMP) which is concerned with sampling, specification and testing, and with the organization, documentation and release procedures which ensure that the necessary and relevant tests are, in fact, carried out and that materials are not released for use, nor products released for sale or supply, until their qualities have been approved.

Our principal duties of the quality controller are clear, as follows:

1. *Approval of specifications for raw materials and pharmaceuticals*
2. *Approval of specifications for packaging materials and completed packs*
3. *Provision of analytical methods*
4. *Performance of all tests or securing their performance*
5. *Release of reject all batches*
6. *Evaluation of quality and stability of finished products*
7. *Examination of returned products, e.g., on complaints*
8. *Elaboration of methods of analysis*

PHYSICAL DISTRIBUTION

Distribution of products to more than 10,000 customers with a sales volume of 3,757.48 million baht is a heavy task. Although we can reduce the distribution lead time to half of those in the recent year, it is still longer than those performed by private firms.

BIOAVAILABILITY

GPO *provides fund for research project dealing with the assessment of efficacy of drugs in vivo by studying the bioavailability and pharmacokinetics of our own drugs comparing with drugs produced from both local and international manufacturers. The objectives are as follows :*

1. *To approve and guarantee the quality of medicines produced by GPO*
2. *The result can be used as information to adjust the correct dosage for Thai people to reduce toxic of side effect from the drugs*

The finished bioavailability products are as follows:

1. *Diazepam Tablet*
2. *Didanosine Tablet*
3. *Digoxin Tablet*
4. *Glibenclamide Tablet*
5. *Hydrochlorothiazide Tablet*
6. *Methyldopa Tablet*
7. *Naproxen Tablet*
8. *Paracetamol Tablet*
9. *Phenytoin Capsule*
10. *Praziquantel Tablet*
11. *Propranolol Tablet*
12. *Theophylline Tablet*
13. *Zidovudine Capsule*
14. *Ketoconazole Tablet*
15. *Fluconazole Capsule*
16. *Stavudine Capsule*
17. *Didanosine buffered powder*

RESEARCH AND DEVELOPMENT

The Research and Development Institute has been set up in 1992 aiming at serving research and development work according to 7th GPO Development Plan which had allocated 185 million baht for establishing the Institute.

The main subjects relating to research and development which are targeted are as follows:

1. *To find out and develop herbal medicine from local herbs*
2. *To conduct researchs to develop and/or improve new formulas for pharmaceuticals especially according to the National Drug List*

3. To research new biotechnology techniques to be used to produce biologicals, chemicals, pharmaceuticals, or reagents

Research and development work will be performed by GPO staff itself and incorporated with other research institutes both in Thailand and from other countries.

GOOD MANUFACTURING PRACTICE (GMP)

Realizing the importance of standard quality, GPO has conducted the Good Manufacturing Practice (GMP) seriously since 1985 by spending more than 65 million baht to reconstruct manufacturing facilities according to GMP standard and has received GMP certificate regularly from the Food and Drug Administration, Ministry of Public Health, from the beginning.

GPO also follows up its own products distributed to the market by sampling 200 samples annually at random to serve the Post Marketing Quality Control Project since 1989.

The result proves that our products in the market is up to standard throughout it's life time.

To be able to compete smartly in the world market, not only developed a quality system on a par with international standards but also committed to protecting the environment, GPO has been awarded ISO 9002 for Sterile Products (Injections), Compressed Tablets, Hard Shell Capsules and Oral Powders since 28th February 1997 and achieved ISO 14001 certification on 28th July 2000 from Bureau Veritas Quality International Co. (BVQI).

โครงสร้างการบริหาร
Organization Chart

องค์การเภสัชกรรม
THE GOVERNMENT PHARMACEUTICAL ORGANIZATION

กองการพิมพ์
Printing Division

กองนโยบายและแผนวิสาหกิจ
Corporate Planning Division

สถาบันวิจัยและพัฒนา
Research and Development Institute

คณะกรรมการองค์การเภสัชกรรม
Board of Directors

แผนกห้องสมุด/ แผนกพัฒนาระบบงาน
Library Section/
System Development Section

กองเคมีภัณฑ์
Chemical Production Division

กองตรวจสอบภายใน
Internal Audit Division

ผู้อำนวยการ
Managing Director

รองผู้อำนวยการ
Deputy Managing Director

รองผู้อำนวยการ
Deputy Managing Director

ผู้เชี่ยวชาญพิเศษ
Senior Expert

สำนักอำนวยการ
Office of the Managing Director

- กองอำนวยการ
  Administrative Division
- กองกฎหมาย
  Legal Division
- กองประชาสัมพันธ์
  Public Relations Division
- กองเทคโนโลยีสารสนเทศ
  Information Technology Division

ฝ่ายทรัพยากรบุคคล
Human Resources Department

- กองการเจ้าหน้าที่
  Personnel Division
- กองค่อบแทนและสิทธิประโยชน์
  Compensation and Benefit Division
- กองฝึกอบรมและพัฒนาบุคลากร
  Training and Personnel Development Division
- กองการแพทย์และอนามัย
  Medical and Health Care Division

ฝ่ายบัญชีและการเงิน
Finance and Accounting Department

- กองบัญชี
  Accounting Division
- กองบัญชีต้นทุน
  Cost Accounting Division
- กองการเงิน
  Finance Division
- กองงบประมาณ
  Budget Division

- กองจัดหาและสำรองวัตถุดิบ
  Raw Material Procurement and Warehouse Division
- กองจัดหาและสำรองบรรจุภัณฑ์
  Packaging Procurement and Warehouse Division
- กองจัดหา
  Procurement Division

ฝ่ายผลิตยา
Pharmaceutical Production Department

- กองบริหารการผลิต
  Production Administrative Division
- กองผลิตยาเม็ด
  Tablets Production Division
- กองผลิตยาฉีดและยาน้ำ
  Sterile and Galenicals Production Division
- กองเพนิซิลลิน
  Penicillin Production Division
- กองผลิตยาจากสมุนไพรและยาทั่วไป
  Herbal and Miscellaneous Products Division
- กองการบรรจุ
  Packing Division

ฝ่ายชีววัตถุ
Biological Production Department

- งานบริหารการผลิตชีววัตถุ
  Planning and Administrative Unit
- กองผลิตวัคซีนจากแบคทีเรีย
  Bacterial Vaccine Division
- กองผลิตวัคซีนจากไวรัส
  Viral Vaccine Division
- กองเซรุ่ม
  Serum Division
- กองบรรจุชีววัตถุ
  Filling and Packing Division
- กองสัตว์ทดลอง
  Experimental Division

ฝ่ายประกันคุณภาพ
Quality Assurance Department

- กองบริหารคุณภาพ
  Quality Assurance Administrative Division
- กองพัฒนาคุณภาพ
  Quality Development Division
- กองมาตรฐานวัตถุดิบ
  Raw Material Standard Division
- กองมาตรฐานบรรจุภัณฑ์
  Packaging Control Division
- กองมาตรฐานผลิตภัณฑ์
  Finished Product Standard Division
- กองมาตรฐานชีววิทยา
  Biological Analysis Division
- กองมาตรฐานชีววัตถุ
  Biological Product Control Division

ฝ่ายช่าง
Technical Department

- กองงานวิศวกรรม
  Engineering Division
- กองซ่อมบำรุงเครื่องจักรผลิต
  Production Machine Maintenance Division
- กองซ่อมบำรุงทั่วไป
  General Maintenance Division

ฝ่ายการตลาดและการขาย
Marketing and Sales Department

- งานธุรกิจต่างประเทศ
  International Business Unit
- กองการตลาด
  Marketing Division
- กองการขายภาครัฐ
  Governmental Sales Division
- กองการขายภาคเอกชน
  Private Sales Division
- งานองค์การเภสัชกรรม สาขาภาคตะวันออกเฉียงเหนือ
  GPO. Northeastern Regional Branch
- งานองค์การเภสัชกรรม สาขาภาคเหนือ
  GPO. Northern Regional Branch
- งานองค์การเภสัชกรรม สาขาภาคใต้
  GPO. Southern Regional Branch

ฝ่ายจัดหาและกระจายผลิตภัณฑ์
Logistics Department

- กองปฏิบัติการขายภาครัฐ
  Governmental Sales Operations Division
- กองผลิตภัณฑ์องค์การฯ
  GPO Product Logistics Division
- กองผลิตภัณฑ์ผู้ผลิตอื่น
  Non-GPO Product Logistics Division

資料 6：タイ国副反応調査用紙と抗毒素の副反応調査結果

ADR ; Adverse Drug Reaction monitoring system

DO NOT WRITE IN SHADED AREAS — *USE TYPEWRITER 12 PITCHES PER INCH, SINGLE SPACING*

CARD 1

WHO COLLABORATING CENTRE FOR INTERNATIONAL DRUG MONITORING REPORT OF SUSPECTED DRUG REACTION

COUNTRY	COUNTRY CASEIDENTIFICATION NO	Source of data	Report Type	Country of engin*	AGE	SEX M or F	ETHNIC ORIGIN	Onset of reaction Day Month Year	RECORD NUMBER
1-3	4-20	21	22	23-25	26-27	28	29-41	42-47	
RAR	8 / A 512	G	3	DES	88	M	NW EUROPEAN	15 / 28 /	

NF FOREIGN REPORT

CARD 2

ADVERSE REACTION PREFERRED TERMS 1-33	ICD-CODE 34-38
CONFUSION	
ATAXIA	
TREMOR	

48: A

OUTCOME
- A RECOVERED WITHOUT SEQUELAE
- B RECOVERED WITH SEQUELAE
- F NOT YET RECOVERED
- D DIED - DUE TO ADVERSE REACTION
- C DIED - DRUG MAY BE CONTRIBUTORY
- N DIED / UNRELATED TO DRUG
- U UNKNOWN

49-53:

IF ADVERSE REACTION IS DEATH, CAUSE OF DEATH (ICD)**

54-55: 9

**INDICATE ICD-VERSION

CARD 3

DRUGS. Trade name if available 1-39	S,I or O 40	DOSAGE REGIMEN AMOUNT 41-43	UNIT 44-45	FREQUENCY 46	ROUTE 47-48	DRUG ADMINISTRATION*** BEGAN Day Month Year 49-54	TERMINATED Day Month Year 56-60	REASON FOR DRUG USE ICD CODE** 61-65
HALDOL	S	2	MG	D	PO	/ 3 / 979	27 / 28 /	295 / 2
LANOXIN	O	3	DF	D	PO	/ 1 / 775	CONTIN	428 / /

*** IF EXACT DATES UNKNOWN, RECORD DURATICATION in positions 55-60 according to GUIDE

65-67: NUMBER OF DRUGS IF MORE THAN SIX

CARD 4

NATIONAL CENTRE COMMENTS

1 / 1

DECHALLENGE :
1. DEFINITE IMPROVEMENT
2. NO IMPROVEMENT
3. MEDICATION CONTINUED
4. UNKNOWN

2 / 3

RECHALLENGE :
1. RECURRENCE OF SYMPTOMS
2. NO RECURRENCE
3. NO RECHALLENGE PERFORMED
4. UNKNOWN

3 / 2

DRUG REACTION RELATIONSHIP :
1. CERTAIN
2. PROBABLE
3. POSSIBLE
4. UNLIKELY
5. UNCLASSIFIED
6. UNCLASSIFIABLE

4-8: / / / /

PREDISPOSING OR CONTRIBUTING CONDITIONS (ICD CODE)**

ADDITIONAL INFORMATION (e.g. Description of ADVERSE REACTION if no preferred term is available)

I D No

ADR Report form.

Adverse Product Reaction

สำหรับศูนย์หรือเจ้าของผู้ผลิตยา	แบบรายงานอาการอันไม่พึงประสงค์จากการใช้ผลิตภัณฑ์สุขภาพ	สำหรับศูนย์ ADR อย. หรือผู้ผลิตยา
เลขที่รายงาน วัน/เดือน/ปีที่รับรายงาน	(ข้อมูลทั้งหมดจะเก็บเป็นความลับของทางราชการโดยเฉพาะ) Key Office ชนิดของรายงาน ☐ ใหม่ ☐ ติดตามผลจากรายงานเดิม	เลขที่รายงาน วัน/เดือน/ปีที่รับรายงาน

Type of Patient Sex age

ข้อมูลเกี่ยวกับผู้ป่วย Patient info

เลขที่ผู้ป่วย ☐ HN ☐ AN.. I D	ประเภท ☐ ผู้ป่วยใน ☐ ผู้ป่วยนอก	เพศ ☐ ชาย ☐ หญิง	อายุ	History. เคยมีประวัติการแพ้ผลิตภัณฑ์หรือไม่ ☐ ไม่มี ☐ มี (ระบุ).....
ชื่อ/นามสกุล Name				ภาวะอื่นๆของผู้ป่วย ที่เกี่ยวข้อง Allergic others

Type of Product drug(RP) New Drug

ข้อมูลเกี่ยวกับผลิตภัณฑ์สุขภาพ Product info

ประเภทของผลิตภัณฑ์ ☐ ยา ☐ ยาใหม่ (SMP) ☐ อาหาร ☐ เครื่องสำอาง ☐ เครื่องมือแพทย์ ☐ วัตถุอันตราย

ชื่อผลิตภัณฑ์ (ชื่อสามัญ / ชื่อการค้า) (ระบุชื่อผู้ผลิต / ผู้จำหน่าย / Lot No. กรณีทราบ)	S;O I *	ขนาดและวิธีใช้ (ความแรง, ปริมาณ, หน่วย, ความถี่, วิธีใช้)	ว/ด/ป ที่เริ่มใช้	ว/ด/ป ที่หยุดใช้	โรคหรืออาหารที่ใช้ผลิตภัณฑ์ และ ICD CODE (กรณีทราบ)
New product	Suspected prod	Route of inj/Admin	first day received	Last day when stop product	

* S = Suspected product หมายถึง ผลิตภัณฑ์ที่สงสัย , O = Other product หมายถึง ผลิตภัณฑ์ที่ใช้ร่วม , I = Product interaction หมายถึง การมีปฏิกิริยาต่อกันของผลิตภัณฑ์

ข้อมูลเกี่ยวกับอาการอันไม่พึงประสงค์

อาการอันไม่พึงประสงค์ที่พบ (ระบุ WHO Adverse Reactions Terms กรณีทราบ)	ICD CODE (กรณีทราบ)	ค่าความผิดปกติทางห้องปฏิบัติการและผลการตรวจร่างกายที่อาจเป็นผลมาจากการใช้ผลิตภัณฑ์ที่สงสัย
		Evalu. Lab.

ว/ด/ป ที่เริ่มพบอาการ _____

ระบุความร้ายแรงของอาการ (Seriousness)	ภายหลังพบอาการอันไม่พึงประสงค์ (after Event)		ผลลัพธ์ (Outcome) ที่เกิดขึ้นภายหลังเกิดอาการอันไม่พึงประสงค์
○ ไม่ร้ายแรง (Non – serious) ○ ร้ายแรง (Serious) คือ ☐ 1. Death (ระบุ ว/ด/ป)..... ☐ 2. Life-threatening ☐ 3. Hospitalization–initial/prolonged ☐ 4. Disability ☐ 5. Congenital anomaly ☐ 6. Required intervention to prevent permanent impairment or damage	○ หยุดใช้ (Dechallenge) ☐ 1. อาการดีขึ้นอย่างชัดเจน (Definite improvement) ☐ 2. อาการไม่ดีขึ้น (No improvement) ☐ 3. ไม่ทราบ (Unknown) ○ ใช้ผลิตภัณฑ์ที่สงสัยต่อไป ☐ 1. ให้ต่อในขนาดเดิม ☐ 2. ให้ต่อแต่ลดขนาดลง	○ ทดลองใช้ซ้ำ (Rechallenge) ☐ 1. เกิดอาการเดิมซ้ำขึ้นอีก (Recurrence of symptoms) ☐ 2. ไม่เกิดอาการอีก (No recurrence) ☐ 3. ไม่ทราบ (Unknown) ○ ไม่มีการใช้ซ้ำ (No rechallenge performed)	☐ 1. หายเป็นปกติโดยไม่มีข้อจำกัดเดิม ☐ 2. หายโดยมีข้อจำกัดเดิม ☐ 3. ยังมีอาการอยู่ ☐ 4. ตาย-เนื่องจากอาการอันไม่พึงประสงค์ (ระบุ ว/ด/ป)..... ☐ 5. ตาย-เนื่องจากอาจเกี่ยวข้องกับผลิตภัณฑ์ ☐ 6. ตาย-เนื่องจากสาเหตุอื่นที่ไม่เกี่ยวข้องกับผลิตภัณฑ์ (ระบุสาเหตุ)..... ☐ 7. ไม่สามารถติดตามผลได้

ข้อมูลเกี่ยวกับผู้รายงาน

แผนกที่พบผู้ป่วย.....

ชื่อผู้วินิจฉัยอาการ..... who diag.

เป็น ☐ แพทย์ ☐ เภสัชกร ☐ พยาบาล ☐ อื่นๆ (ระบุ).....

ชื่อผู้ประเมิน/บันทึกรายงาน.....

เป็น ☐ แพทย์ ☐ เภสัชกร ☐ พยาบาล ☐ อื่นๆ (ระบุ).....

ข้อมูลเกี่ยวกับสถานพยาบาลหรือแหล่งที่รายงาน which hospital follow up info

เลขที่รายงาน.....ว/ด/ป ที่บันทึกรายงาน.....

ชื่อสถานพยาบาล/แหล่งที่รายงาน.....

จังหวัด.....

ผลการประเมินความสัมพันธ์ของผลิตภัณฑ์กับอาการอันไม่พึงประสงค์

☐ Certain ☐ Probable ☐ Possible ☐ Unlikely

กลุ่มผลิตภัณฑ์หลัก กลุ่มผลิตภัณฑ์ย่อย ชื่อสารสำคัญ	ชื่อการค้า	อาการไม่พึงประสงค์	เพศ	อายุ	ประเภท	ผล	เลขที่
GENERAL ANTIINFECTIVES, SYSTEMIC							
IMMUNE SERA AND IMMUNOGLOBULINS							
SNAKE VENOM ANTISERUM		ABDOMINAL PAIN	หญิง	54 ปี	ผู้ป่วยใน		40/187
			หญิง	14 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	37/2123
		ALLERGIC REACTION	หญิง	42 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	37/1676
		ANAPHYLACTIC SHOCK	หญิง	60 ปี		หายเป็นปกติโดยไม่มีร่องรอ	35/968
			หญิง	44 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	37/60
			ชาย	39 ปี	ผู้ป่วยใน	ไม่สามารถติดตามผลได้	38/1926
			หญิง	58 ปี	ผู้ป่วยนอก	หายเป็นปกติโดยไม่มีร่องรอ	37/2126
			ชาย	23 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	36/1629
			หญิง	29 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	37/2764
		ANAPHYLACTOID REACTION	ชาย	23 ปี		หายเป็นปกติโดยไม่มีร่องรอ	33/735
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		ANGIOEDEMA	ชาย	52 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	38/1130
		APNOEA	หญิง	73 ปี	ผู้ป่วยนอก	หายเป็นปกติโดยไม่มีร่องรอ	39/2355
			หญิง	5 ปี		หายเป็นปกติโดยไม่มีร่องรอ	32/316
			หญิง	42 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	37/1676
		CHEST PAIN	ชาย	27 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	38/1935
			ชาย	30 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	38/3126
			ชาย	14 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	40/2189
			หญิง	5 ปี		หายเป็นปกติโดยไม่มีร่องรอ	32/316
			ชาย	42 ปี		หายเป็นปกติโดยไม่มีร่องรอ	36/156
			หญิง	58 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	39/593
		CYANOSIS	หญิง	73 ปี	ผู้ป่วยนอก	หายเป็นปกติโดยไม่มีร่องรอ	39/2355
		DYSPEPSIA	ชาย	46 ปี	ผู้ป่วยนอก	หายเป็นปกติโดยไม่มีร่องรอ	42/803
		DYSPNOEA	ชาย	56 ปี		หายเป็นปกติโดยไม่มีร่องรอ	31/683
			ชาย	42 ปี		หายเป็นปกติโดยไม่มีร่องรอ	36/156
			ชาย	34 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	38/1351
			หญิง	58 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	39/593
			ชาย	61 ปี	ผู้ป่วยใน	หายเป็นปกติโดยไม่มีร่องรอ	41/14
			หญิง	14 ปี	ผู้ป่วยใน	ยังมีอาการอยู่	42/4231

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分担研究報告書

抗毒素の安全性に関する研究

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研究要旨

昨年、国内で試験製造されたヤマカガシ抗毒素および７種の輸入抗毒素の品質管理試験としてエンドトキシン試験適用を検討した結果、すべての抗毒素においてエンドトキシン試験の適用が可能であると考えられた。またエンドトキシン試験によりこれらの抗毒素を測定したところ、顕著なエンドトキシン汚染が認められた抗毒素は存在しなかった。しかし、治療で大量の抗毒素が投与される場合では発熱を起こす可能性があり、抗毒素中のエンドトキシン含量を評価するには、単位容量当たりのエンドトキシン含量だけでなく、臨床で使用される用量を考慮に入れることが重要であると考えられた。

A．研究目的

国内で製造されている抗毒素は、生物学的製剤基準により製剤の安全性を保証する試験の１つとして発熱試験が適用されている。しかし、発熱試験は多くのウサギを必要とすることあるいは精度及び再現性の点など多くの問題を含んでいる。近年、カブトガニ血球抽出液を用いたエンドトキシン試験法が簡便で感度も良く、グルカン等との反応性が除去あるいは抑制されたエンドトキシン特異試薬が開発され、多くの抗生物質製剤をはじめいくつかの生物学的製剤の発熱試験に替わる試験法として適用が開始されている。そこで我が国で必要な抗毒素で、諸外国から輸入可能な抗毒素（７種）および国内で試験製造されたヤマカガシ抗毒素の安全性を確認するため、これら抗毒素へのエンドトキシン試験適用の可能性の検討および抗毒素中のエンドトキシン含量を測定し臨床で使用される用量を考慮に入れた安全性の評価を試みた。

B．研究方法

エンドトキシン試験は生物学的製剤基準