Residency Program
Doctor of Medicine (MD)
Curriculum (Phase-B)

Endocrinology & Metabolism

Bangabandhu Sheikh Mujib Medical University
Dhaka, Bangladesh
1. Introduction

1.1 Overview of the specialty
Endocrinology is a broad base subject. It includes diabetes and other hormonal disorders. Diabetes is a global health problem including Bangladesh. Recent data shows about 20% of our Dhaka city dwellers are hyperglycemic. Diabetes is a serious disease. It can affect all systems of our body. Diabetes is a well controllable and partly preventable disease. Recent advancements give us the opportunity to offer the patient a normal or near normal life. Hormonal problems particularly thyroid problems are very common in our population. Metabolic syndrome, Infertility, Osteoporosis, Polycystic ovary syndrome and Dyslipidemia are the emerging problem of this time. Diabetes and Endocrine problems are gradually increasing day by day. Endocrine diseases and diabetes affect every physiological systems of the body determining that specialists enjoy a wide range of skills and expertise and make a major contribution to general medicine in its broadest sense.

1.2 Endocrine Discipline BSMMU
The Endocrine, Diabetes & hormonal services in BSMMU (previously known as IPGMR) Hospital started as thyroid clinic under the guidance of Prof. M N Alam hosted by Nuclear Medicine and patronized by the department of Medicine in 1995. Subsequently an out patient service of Endocrine OPD was also started in the same year of 1997 run by the Medical Officers and Faculty under supervision of the Medicine unit-II. It emerged as separate entity in the same department as Endocrine Wing merged with Medicine unit-II of the department in 1999. In the year 2003, the discipline of Endocrine Medicine headed by a Professor of Endocrinology (Prof. Naseem Akhter Chowdhury) started as a separate unit under the Department of Medicine. Simultaneously (2006) MD (Endocrinology) course of BSMMU was also started. At present five final year students (old curriculum), two FCPS final part Endocrine students, 40 in different stages (part-I & part-II) and 27
Residency Program

Residents (Phase A - 17, Phase B - 10) are working in this department. The discipline also harbors the Fellowship course of Medicine and Endocrinology as well as training of these courses designed by the BCPS. Residency program and other courses of Endocrinology are running successfully and smoothly. First MD (EM) passed in January 2012.

The in-patient service is run as separate unit of Medicine under department of Medicine since 2003. Recently from 14/08/12 Endocrinology emerges as separate department of BSMMU, under the chairmanship of Professor Md. Farid Uddin. At present it provides services for the diagnosis and management of hormonal and metabolic disorders like diabetes, diseases of thyroid, parathyroid, pituitary glands, male reproductive & ovarian disorders, as well as obesity and metabolic disorders.

Our OPD services started as a one day consultancy service, subsequently (1999) it is a full-fledged diabetes and endocrine OPD starting from 8.00 am to 02.30 pm under the supervision of endocrine consultants. Presently more than 150 patients getting diabetes and endocrine services from small OPD room. Last 10 years we served more then 2 lacs patients free of consultancy. From this small room many of our post graduate students successfully completed their research work. This is the only integrated Endocrine referral centre in Bangladesh.

1.3 Purpose of the curriculum
The purpose of this curriculum is to define the process of training and the competencies needed for the award of a certificate with MD (EM) degree.

2. Goals and Objectives:
2.1 Goals:
Our goal is to produce competent diabetologists & endocrinologists having strong background knowledge in internal medicine, fit for giving consultancy service independently even in the periphery.

2.2 Objectives:
1. Hands-on experience with history taking and examination of a large number of cases representative of the specialty of Endocrinology and Diabetes.
2. Analysis of the clinical clues and laboratory data to arrive at a differential diagnosis.
3. Providing a plan for further evaluation and/or therapy.
4. Utilizing diagnostic and therapeutic modalities in the most cost-effective manner.
5. Understand the usefulness and limitations of diagnostic and therapeutic modalities.

2.3 Overall Goals:
- To prepare endocrinologists who would be able to meet and respond to the changing health care needs and expectation of the society.
- To develop endocrinologists who possess knowledge, skill and attitudes that will ensure that they are competent to practice diabetes and endocrine medicine, safely and effectively.
- To ensure that they have appropriate foundation for lifelong learning and further training in their specialty.
- To help them to develop to be critical thinkers and problem solvers when managing health problems in the community they serve.

3. Admission Requirements for Phase B Training:
A. Residents who have successfully passed Phase A Final Examination in Medicine and Allied are eligible for enrolment in the Phase B Program.
B. Candidates with FCPS / MD in Internal Medicine can be enrolled directly into Phase-B program.
4. Phase B Curriculum Structure:
The training is designed to develop both the generic and specialty-specific attributes necessary to practice independently as a consult Endocrinologist. The aim is to train individuals to provide the highest standard of service to patients with endocrine disorders. This includes the development of positive attitudes towards lifelong learning and the ability to adapt to future technological advances and the changing expectations of society. Specialty training in Endocrinology & diabetes consists of core general (Phase A, 2 years) and higher specialty training in Endocrinology, diabetes and metabolism (Phase B, 3 years —Details in year planning).

4.1. Phase B: Endocrinology specialty training
In-depth specialty specific educational and training program in this phase will make the residents competent and prepare them for the specialty qualification. It will provide educational program covering the specialty of Diabetes, Endocrinology and Metabolism, Biostatistics, Research Methodology and Medical Education along with rotation specific clinical training.

4.2. Expected outcome at the completion of Phase B program:
At the completion of phase B training, it is expected that trainees will have a broad based exposure to, and clinical experiences within, each of the discipline areas that will be further developed to a depth of competence within their Phase B Training Program. Acquired the skills to be able to work within, and fully utilize, multi-disciplinary team-based approaches to the assessment, management and care of their patients.

5. Teaching and Learning Methods
- Case based, small group interactive discussions
- Problem-oriented case based teaching
- Problem-oriented reading

5.1 Design: Competency based Outcome oriented
The MD (EM) residency program is designed to allow residents to meet required competencies in patient care, medical knowledge & proper attitude for final examination in Endocrinology, Diabetes and Metabolism. Competencies are defined as the ability to use knowledge, skill & appropriate attitudes & personal qualities to solve clinical problems in professional, ethical & proficient way for optimal patient & societal outcome.

6. Record of Training:
The evidence required to confirm progress through training includes:
- Details of the training rotations, the training plan agreed with weekly timetables and duty rosters; and numbers of practical procedures and outcomes.
- Confirmations of attendance at events in the educational Program, at departmental and inter-departmental meetings and other educational events.
- Confirmation (certificates) of attendance at subject-based/skills-training/ instructional courses.
- Recorded attendance at conferences and meetings.
- A properly completed logbook with entries capable of testifying to the training objectives which have been attained and the standard of performance achieved.
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<tr>
<th>Residency Program</th>
<th>Endocrinology &amp; Metabolism</th>
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<td>- CME activity.</td>
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<td>- Supervisor's reports on Observed performance (in the workplace) of duties, practical procedures, of presentations made and teaching activity of advising and working with others of standards of case notes, correspondence and communication with others.</td>
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6.1 Logbook:
Residents are required to maintain a logbook in which entries of academic/professional work done during the period of training should be made on a daily basis, and signed by the supervisor. Completed and duly certified logbook will form a part of the application for appearing in Phase B Final Examination.

6.2 Portfolio:
This is a collection of evidence documenting trainee’s learning and achievements during their training. The trainee takes responsibilities for the portfolio’s creation and maintenance. It will form the basis of assessment of progression.

6.3 Case Log:
The trainee must maintain a record of the patients he or she is directly involved in the care and follow up. This will consist of a log of minimum of 2(two) cases in the in-patient and/or out setting every month, over a period of 6 month to 2 years, for emergency cases six month and for chronic cases 1-2 years. This will come to a minimum of 30 (thirty) cases. At least 15 Endocrine cases other than Diabetes and its various complications should be included. This should be recorded to the log book.

7 Research:
Development of research competencies forms an important part of the Residency Program curriculum as they are an essential set of skills for effective clinical practice. Undertaking research helps to develop critical thinking and the ability to review medical literature. Every resident shall carry out work on an assigned research project under the guidance of a recognized supervisor; the project shall be written and submitted in the form of a Thesis. 1st and 2nd Block for protocol writing and IRB clearance, 3rd and 4th Block for patient collection and thesis writing, 5th Block thesis submission. Thesis defense is the prerequisite for rest of the final part examination.

8. Assessment:
The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists for independent practice and lifelong learning and covers cognitive, psychomotor and affective domains. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum. Assessment includes both Formative Assessment and Summative (Phase final) Examinations.

8.1 Formative Assessment:
Formative assessment will be conducted throughout the training phases. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (Phase completion exams). There will be Continuous (day-to-day) and Periodic type of formative assessment.
8.1.1. End of Block Assessment (EBA):
End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, structured clinical Assessment (SCA), medical record review, and logbook assessment. Unsatisfactory block training must be satisfactorily completed to be eligible for phase final examination.

8.1.2. Formative assessment for Academic modules for Biostatistics and Research Methodology and Medical Education to be done in the first nine months of Phase B training. Residents getting unsatisfactory grade must achieve satisfactory grade by appearing the re-evaluation examination to be eligible for the Phase B Final Examination.

8.2. Summative Examination:
Assessment will be done in two broad compartments.

a) **Compartment A:** Consist of 3 (three) components.
   1. Written Examination (Consisting of 2 papers).
   2. Clinical Examination (One long and four short cases).
   3. SCA and Oral (10 stations SCA, Oral one board consisting of 2 examiners).

Every Resident must pass all the 3 components of compartment-A separately. Candidates will be declared failed if he/she fails in one or more component(s) of the examination. He/she then have to appear all the 3 components in the next Phase B Final Examination.

b) **Compartment B:** Thesis and Thesis defense.

8.2.1. Written Examination:
Two Papers: Contents of written papers listed in Annexure II
Question type and marks:
- Two Papers (Paper I and Paper II); 100 marks each; Time 3 hrs for each paper. Pass marks-60% of total of 2 papers.
- Each paper will consist of Two Groups:
  - **Group A:**
    - 10 short questions (5 marks each)
    - These will assess the knowledge of different level and its application
  - **Group B:**
    - 5 scenario based problem solving questions (10 marks for each).
    - The questions should focus to assess the capability of handling clinical problem independently and comprehensively as a specialist.
    - Suggested format:
      - A scenario followed by question(s).
8.2.2. Clinical Examination: Long case and Short case:
- There will be one long case and four short cases.
  i) Long case: Marks-100
    - Directly observed
    - Two examiners for each examinee.
    - History taking and examination by the examinee – 30min.
    - Discussion on the case 20 min. (presentation 6min, crossing 6x2min and decision 2min).
    - Examiners will not ask any question nor stop the examinee in any way during history taking and physical examinations.
    - Discussion should be done preferably as per structured format and proper weightage on different segments of clinical skills.
  ii) Short cases: Marks-100
    - Four in number
    - Time 20-30 min. (Time will be equally divided for each short case)
    - Crossing should be done with proper weightage on different segment of clinical skills.
  iii) Pass marks: 60% of total of Long and Short Cases

8.2.3. Structured Clinical Assessment (SCA): Marks-100
- 10 stations: 5 min each

8.2.4. Oral Examination: Marks-100
- One board consisting of 2 examiners.
- 20 minutes (9+9+2).

8.2.5. Pass marks in SCA and Oral: 60% of total (SCA and Oral).

8.3. Thesis Evaluation:
- Marks: Thesis writing-200; Defense-100: Marks for acceptane-60% of total.
- To be evaluated by 3 (three) evaluators:- 2 subject specialists and one academician preferably involve in research and teaching methodology.
- Among the subject specialists one should be external.
- Evaluators should be in the rank of Professor/Associate Professor.
- Supervisor will attend the defense as an observer and may interact only when requested by the evaluators.
- Thesis must be submitted to the controller of Exam not later than 27 months of enrolment in Phase-B.
- Thesis must be sent to the evaluators 2 (Two) weeks prior to assessment date.
- Evaluation will cover Thesis writing and its defense.
- For thesis writing evaluator will mark on its structure, content, flow, scientific value, cohesion, etc.
- For defense – Candidate is expected to defend, justify and relate the work and its findings.
- Assessment must be completed in next 3 months.
- Outcome of the assessment shall be in 4 categories – “Accepted”, “Accepted with minor correction”, “Accepted with major correction” and “Not Accepted”.

8.3.1. Description of terms:
- Accepted: Assessors will sign the document and resident will bound it and submit to the Controller of Examinations by 10 days of the examination.
9. Supervision and Training Monitoring:
Training should incorporate the principle of gradually increasing responsibility, and provide each trainee with a sufficient scope, volume and variety of experience in a range of settings that include inpatients, outpatients, emergency and intensive care. All elements of work in training rotation must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient. Trainees will at all times have a named Supervisor, responsible for overseeing their education.

Supervisors are responsible for supervision of learning throughout the program to ensure patient and / or laboratory safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plans based on the feedback on both formative and summative assessments as well as sign the logbook and portfolio. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times. The Course Coordinator of each department coordinates all training and academic activities of the program in collaboration with the Course Manager. The Course Director of each faculty directs guides and manages curricular activities under his/ her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisors.
10. Curriculum Implementation, Review and Updating:
10.1 Intended use of curriculum by Trainers & Trainees
Educational supervisors & trainers can access the up-to-date curriculum from the course director (Medical Faculty) or BSMMU website & will be expected to use this as the basis of their discussion with trainees. Both trainers & trainees are expected to have a good knowledge of the curriculum & should use it as a guide for their training program. Each trainee will engage with the curriculum by maintaining the portfolio & use the curriculum to develop learning objectives & reflect on learning experiences.

10.2 Recording process
The trainee's main responsibilities are to ensure the portfolio is kept up-to-date, arrange assessments & ensure they are recorded, prepared drafts to appraisal forms, maintain their personal development plan, record their reflections on learning & record their progress through curriculum. The trainee should maintain a logbook of day to day activities to document their experiences. The supervisor's main responsibilities are to use portfolio evidences such as outcomes of assessment, reflections & personal development plans to inform appraisal meetings. They are also expected to update the trainee's record of progress through the curriculum.

10.3 Curriculum review & updating
As endocrinology has historically been rapidly changing specialty & residency program in our University is a new one, the need for review & updating of curriculum is evident. The curriculum is specifically designed to guide an educational process & will continue to be the subject of active redrafting, to reflect changes in both endocrinology & educational theory & practice. Trainees & training program directors are encouraged to discuss the curriculum & to feedback on content & issue regarding implementation at residency program committee level. Review will occur annually for any minor changes to the curriculum. The endocrine curriculum will be reviewed with input from the various sub specialties & experts from organizations like BIRDEM and BIHS.

11. Phase B Syllabus
The educational process in Endocrine Medicine aims to provide basic knowledge, intellectual, clinical and transferable skills to produce competent specialists in Endocrinology. These specialists will be capable of providing specialized care of the highest order to patients with diabetes and endocrine disorders in the community as well as clinical tertiary centers. They will recognize the health needs of the community and carry out professional obligations ethically and keeping their standards by engaging in continuing medical education. The program also aims to introduce the candidates to the basics of scientific medical research.

11.1 Learning Objectives:
A. Scientific basis of Endocrinology
Basic Principles in Endocrinology
1. Explain Endocrine Physiology and Anatomy (Advanced and Clinical).
2. Explain Endocrine Biochemistry (Advanced and Clinical).
3. Apply basic knowledge for Immunological, Metabolic and Genetic disorders.

B. Presentations and diseases
(a) Presentations and Manifestations of Endocrine diseases
1. Assess and treat patients presenting with polyuria and polydipsia
2. Assess and treat patients presenting with polyphagia
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3. Assess and treat patients presenting with weight loss or weight gain
4. Assess and treat patients presenting with lethargy
5. Assess and treat patients presenting with palpitation
6. Assess and treat patients presenting with hypokalemic or episodic hypertension
7. Assess and treat patients presenting with blurred vision
8. Assess and treat patients presenting with erectile dysfunction
9. Assess and treat patients presenting with recurrent infection
10. Assess and treat patients presenting with non-healing wound
11. Assess and treat patients presenting with galactorrhoea
12. Assess and treat patients presenting with amenorrhoea
13. Assess and treat patients presenting with Hirsutism
14. Assess and treat patients presenting with headache and visual disturbance
15. Assess and treat patients presenting with short / tall stature
16. Assess and treat patients presenting with goiter, gynaecomastia or proptosis
17. Assess and treat patients presenting with early or delayed puberty
18. Assess and treat patients presenting with low trauma fracture
19. Assess and treat patients presenting with tetany
20. Assess and treat patients presenting with hyperpigmentation
21. Assess and treat patients presenting with infertility

**(b) Diabetes, Endocrine & Metabolic diseases and disorders**

1. Evaluation and management of uncomplicated DM

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2. Evaluation and management of DM with hypertension
3. Evaluation and management of DM with dyslipidaemia
4. Evaluation and management of Diabetic foot
5. Evaluation and management of DM with eye disease
6. Evaluation and management of GDM
7. Evaluation and management of DM in children, adolescent and elderly patients
8. Evaluation and management of DM in special situations like Surgery, Critically ill patient and during Ramadan
9. Evaluation and management of patients with acute and chronic diabetic complications
10. Evaluation and management of patients presenting with hypoglycemic disorders
11. Evaluation and management of patients with hypothyroidism
12. Evaluation and management of patients with Graves' disease
13. Evaluation and management of patients with painful thyroid
14. Evaluation and management of patients with nodular goiter
15. Evaluation and management of patients with thyroid disorders in children, pregnancy, lactation and IHD
16. Evaluation and management of patients with renal calculi/nephrocalcinosis
17. Evaluation and management of patients with hypo or hyper parathyroidism
18. Evaluation and management of patients with bone pain/deformity
19. Evaluation and management of patients with adrenal mass
20. Evaluation and management of patients with steroid withdrawal syndrome
21. Evaluation and management of patients with Menopausal syndrome
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22. Evaluation and management of patients with empty sella syndrome
23. Evaluation and management of patients with enlarged sella
24. Evaluation and management of patients with hyperuricemia/gout
25. Evaluation and management of patients with inborn errors of Metabolism
26. Evaluation and management of neoplastic endocrine disorders
27. Evaluation and management of familial hyperlipidaemia

(c) Diabetic and Endocrine Emergencies
1. DKA, HONK, hypoglycemia, lactic acidosis
2. Thyroid storm, Myxedema coma, Thyrtoxic periodic paralysis, Thyroid abscess
3. Tetany, hungry bone syndrome, severe hypercalcemia
4. Addisonian crisis, hypertensive crisis, hyponatremia, hypokalemia
5. Diabetes Insipidus, Pituitary apoplexy
6. Acute gouty arthritis, acute intermittent porphyria

(d) Practical Performance, Procedures and Investigations
(Supervise, Perform and Interpret- log book)
1. Different types of OGTT, Use of Glucometer, Insulin technique, insulin pump
2. 24 h Urinary - VMA, Free Cortisol, Calcium, Potassium, Protein
3. Tests- Synacthen test, Dexamethasone suppression test, Water deprivation test, Mixed meal challenge test, Clomiphene stimulation test, GnRH stimulation test, Insulin tolerance test, CRH stimulation test, Post exercise/levodopa growth hormone measurement, Growth hormone suppression test
4. FNAC of thyroid, parathyroid, lymph node, adrenal mass, testis
5. USG of thyroid, parathyroid, adrenal, gonads
6. X-ray neck, X-ray skull, X-ray abdomen, X-ray osteoporotic bone, X-ray for bone age
7. DEXA, NCS-EMG
8. CT/MRI - brain, orbit, abdomen
9. Radio iodine uptake of thyroid, Scan - Thyroid, parathyroid, whole body, testis
10. Measurements – Anthropometric measurements, BMI, Exophthalmometry, Orchidometry
11. Demonstration of autonomic dysfunction, latent tetany, Fundoscopic examination, monofilament test, examination of thyroid, proptosis, diabetic foot

Education, Motivation and Referral
- Residents must develop the skill to educate, motivate and refer the patient under the guidance of their supervisors.
- Residents must have a knowledge to prescribe dietary adjustment and physical exercise of the patient.
- Residents must know the home monitoring and sick day management of the diabetic patients
### Annexure 1: Clinical training rotations:

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<th>Block 1</th>
<th>Months</th>
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<tbody>
<tr>
<td><strong>Educational Program</strong></td>
<td>Epidemiology of Diabetes &amp; Endocrine problems. Applied anatomy &amp; physiology. Principles of Endocrinology &amp; Metabolic disorders. Genetic basis of Diabetes, Endocrine &amp; Metabolic disorders. Journal Club, CME and Case Presentation. <strong>Basic Courses:</strong> Biostatistics, Research Methodology, Basics of Medical Education.</td>
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<td>Endocrinology Inpatient/Outpatient. Improvised POMR writing.</td>
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<td>Protocol development.</td>
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<td><strong>Educational Program</strong></td>
<td>Basic Diabetology &amp; Endocrinology. Journal Club, CME and Case Presentation.</td>
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<td>Endocrinology Inpatient/Outpatient. Longitudinal case follow-up &amp; profiling.</td>
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<td><strong>Educational Program</strong></td>
<td>Clinical &amp; advanced Diabetology &amp; Endocrinology. Teaching &amp; demonstration to junior students.</td>
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<td><strong>Clinical Training Rotations</strong></td>
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<th>Block 6</th>
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*Eligibility Assessment & Phase B Final Examination*
Annexure 2:
Contents of written papers
Contents of Paper 1:  Diabetology
Contents of Paper 2:  Endocrinology & Metabolism

Annexure 3:
Acknowledgement:
1. Professor Md. Nazrul Islam  
   Course Director (Faculty of Medicine), BSMMU.

2. Professor A B M Abdullah  
   Dean (Faculty of Medicine), BSMMU.

3. Professor Syed Atiquil Haq  
   Chairman, Rheumatology, BSMMU.

4. Professor M A Jalil Chowdhury  
   Chairman, Internal Medicine, BSMMU.

5. Professor Hajera Mahtab  
   Advisor Endocrine Academy, BSMMU.

6. Professor M N Alam  
   Advisor Endocrine Academy, BSMMU.

7. Professor Khondker Manzare Shamim  
   Chairman, Anatomy, BSMMU.

8. Final Part Endocrine students  
   Department of Endocrinology, BSMMU.

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