

Book-3.1



ADD 15 YEARS TO OUR LIFE
CAN WE? OF COURSE, WE CAN!!

Add 15 Years |

Diabetes - Book 3.1

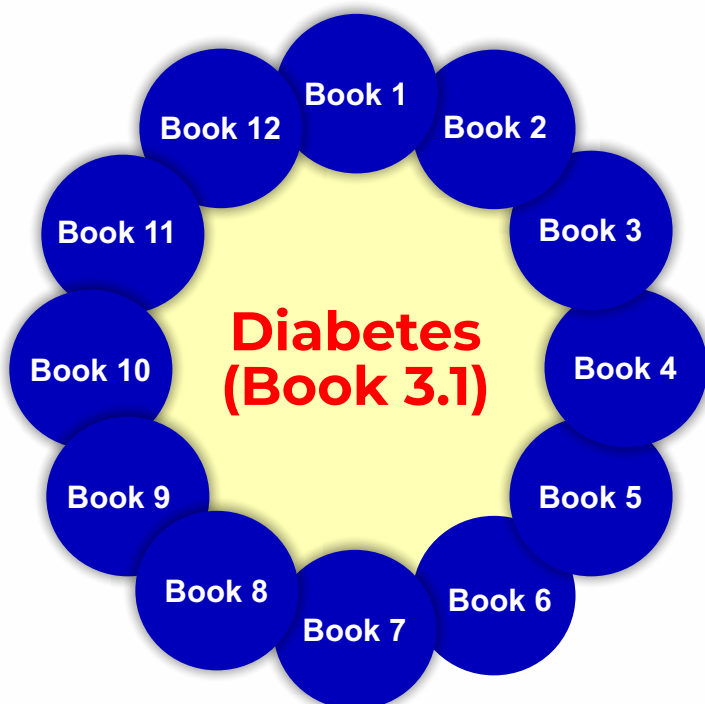
SULFONYLUREAS

(1st generation medicine)

IN 2021: No reason for kidneys to fail!!

Before 1921: Yes, You would have died.
(year of Nobel Prize for Insulin)

USA/India Edition 2021 | ENGLISH



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DM/Fellowship, USA



ADD 15 YEARS TO OUR LIFE
CAN WE? OF COURSE, WE CAN!!

These
“Medical Books”
can really help
in Adding
“15 Healthier Years”
to Our Lifespan!

“The recommended age is
13yrs to 80yrs

The sooner you start, more
years you add to lifespan.”



ADD 15 YEARS TO OUR LIFE
CAN WE? OF COURSE, WE CAN!!

PREFACE

Think About It!

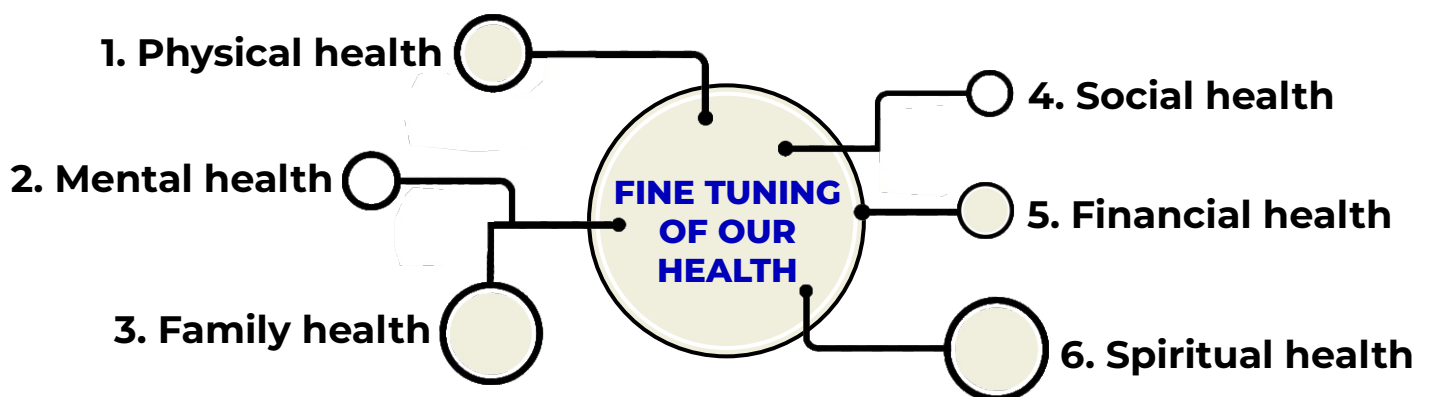
Miracles do not happen in real life.

At least in India (NOT very common in U.S.) we seek medical care only when we have so called “alarming symptoms” and MD/Physicians provide care with their focus on these “alarming symptoms”. We call it “Crisis Medicine”.

Personally speaking, in 2020/2021 and in the coming years, these “alarming symptoms” (called “Crisis Medicine”) should be RARE before we get into the 75 to 85 years of age group.

PROVIDED

*We keep **fine tuning our health** (medical definition) and gain insight about fundamental medical knowledge, and we actively plan and pay attention to our:*



TRUST ME ALL THE 6 TYPES OF HEALTH ARE IMPORTANT

Results will be dramatic.

DISCLAIMER

In all the books that I am writing as a physician and a MD with a lifetime of experience (along with my team)-

I have mentioned the most common medical facts which each one of us need to know in our day to day life.

Ignorance is never a bliss and 2020 has shown us that.

I highly recommend that anybody entering middle school (8th grade i.e. a 13-year-old) should start reading these books and try to read as many as he or she can **so that they can get an insight into the most common medical facts.**

These books are written in basic English and several other languages as well.

If we get an insight into medical facts before we get into chain-smoking and excessive alcohol use or another drug abuse, then ultimately, we can live a healthy and a long life.

All my research and common sense says that starting at the age of 13 years, (that is when we enter our teenage years, **our personality, our habits, our likings and our disliking -- all are pretty much shaped by the time we get to 26 years old or older.**

Both India and USA are very dear to me,

In the former I was born; I have my parents.
In the latter, I have my wife and my children.

One thing became obvious to me as I live in USA, that the population is taking advantage of the latest medical advances.

Our Indian community, all our friends and families, when we have medical issues, are really putting themselves at the mercies of government and private hospitals, and doctors (with “zero” trust).

In India, people have to spend their own money. Realizing this, I have provided all the medical information, which is available to us doctors, so that one can make wise choices and confidently take their health in their own hands.

But still I sincerely request that you should not take any medications without the supervision of your own family doctors.



The facts that I have provided in my books are available in every other medical book, but I them in very simple English or in your language **because how are you going to make right choices in relation to your health, if you do not know what the answer is.**

Our horoscope/stars are not enough, and consulting a pandit, priest or maulana is never enough.

Blind faith is never an option.

Prayers help, yes! when we do not know the answer to a situation.

If our car runs out of petrol, then eventually it will not move; does not matter how much we may pray, it is never going to happen unless we fill the tank.

If you anticipate and choose wisely, you will not have a crisis. So, our disclaimer is that we give you the insights but please always consult your physicians before starting any prescription medications.



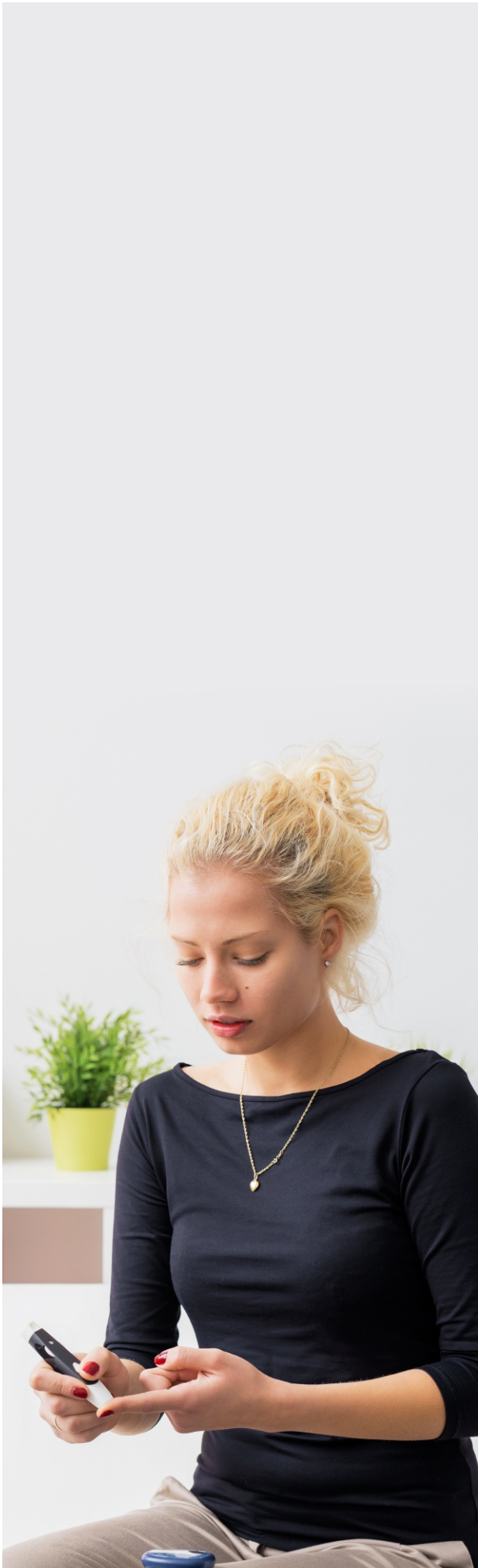


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IN 2021: No reason for kidneys to fail!!

Before 1921: Yes, You would have died.
(year of Nobel Prize for Insulin)

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Chapter 4

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ADD 15 YEARS TO OUR LIFE
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Referring
Diabetes - Book 1
HIGH BLOOD SUGAR
IN 2021: No reason for kidneys to fail!!
Before 1921: Yes, You would have died.
(year of Nobel Prize for Insulin)

Chapter 1

Introduction



Frederick Grant Banting

John James R. Macleod

- The Nobel Prize in Physiology or Medicine 1923 was awarded jointly to Frederick Grant Banting and John James Rickard Macleod "for the discovery of **insulin**" in 1916.

Chap1Fig1

Insulin was discovered in 1921 leading to a nobel prize. In 2021 we have 12 groups of medicines for medicine diabetes.

Think About It!

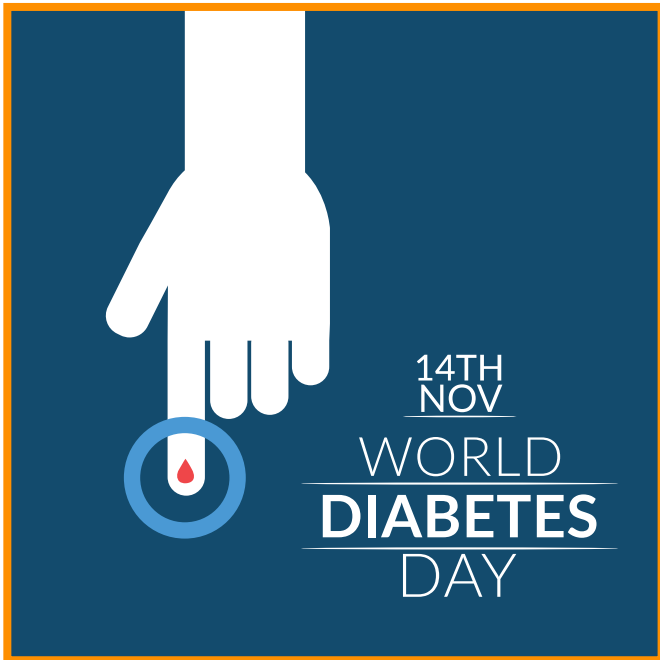
Before 1921

Every child who was born with Type 1 diabetes or lack of insulin would eventually die.

The discovery of insulin or should we say the discovery of insulin as a medicine has changed the history of diabetes and its treatment.

In 2021

We can now have a healthy life with functioning kidneys till very end!!

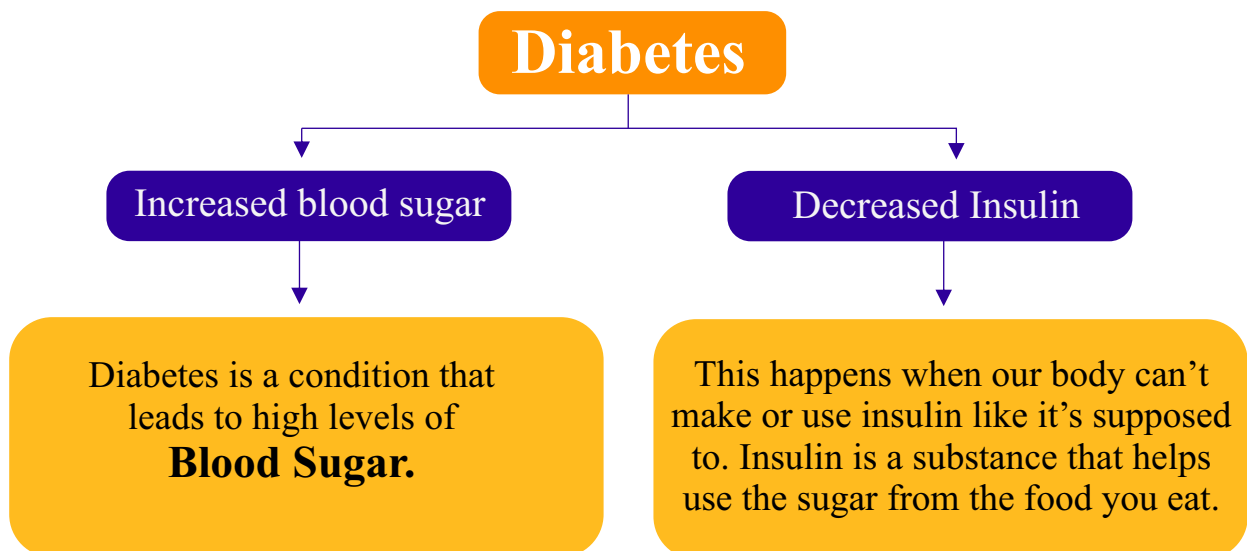


But yes, we have 12 to 13 different groups of medicines for high blood sugar.

The golden principle of the medicinal treatment of diabetes is that we start with one medication early in the course of treatment of diabetes.

We keep adding medicines as needed to control our blood sugar (along with diet & exercise)

Chap1Fig1



Chapter 2

The Golden Principle in Management of high blood sugar (Diabetes)

The golden principle of the medical treatment of diabetes is that Once we have high blood sugar (Diabetes) – exercise and diet management are needed life-long.

Together diet, exercise and medications – all will help!!

Risk of taking medications are minimal as compared to the benefits that we receive from these medicines!

1. We start with one medication early in the course of treatment of diabetes

Start with one medication

2. Targets for blood sugar control is decided by physician.

Decide Targets

3. Usual target is HbA1c < 7

HbA1c < 7

4. As youngish we are more, we want to keep blood sugar is close to 100mg

Blood sugar close to 100mg

Continued

The golden principle of the medical treatment of diabetes is that Once we have high blood sugar (Diabetes) – exercise and diet management are needed life-long.

5. Today in 2021 are several groups of excellent medicines are available:

a) which can **bring down our blood sugar by different mechanisms of action.**

b) As a golden rule, what we should start with **one medicine** if our blood sugar is not extremely high.

c) And as time goes on,
We can add a second medicine.

Start with one medicine, if blood sugar is not very high

Start with one medicine, Add a second medicine, if needed And add a third medicine, if necessary

d) Or **we can even add a third medicine which works by a different mechanism.**

Chapter 3

Diet and exercise are an integral part of high blood sugar management!

[Diet and exercise are an integral part of high blood sugar management!]

Purpose of medical management and medicines for diabetes is:

- **To manage our blood sugar**
- **As close to 100mg as possible**
- **And HbA1c < 7**



Chap3Fig1

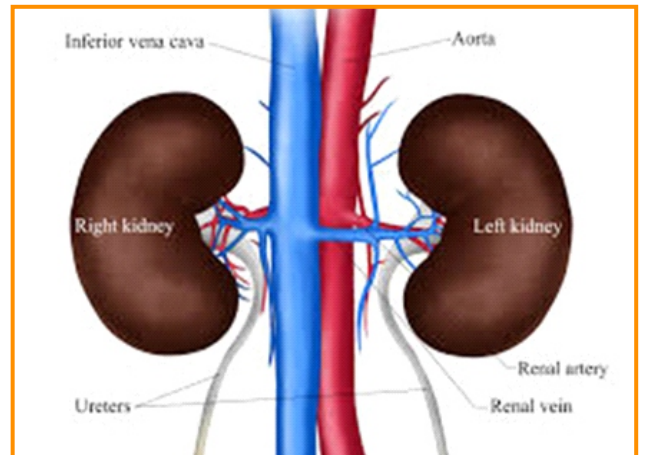


Chap3Fig2

HbA1c

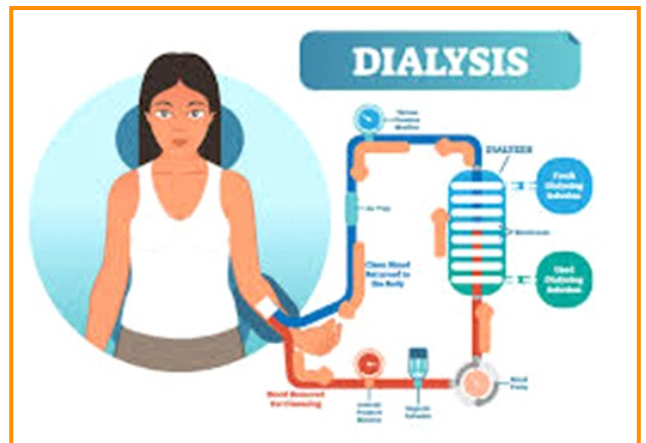
Chap3Fig3

- **To prevent kidney failure**



Chap3Fig4

- **And no dialysis**



Chap3Fig5

- **No heart attack (Diabetes is literally one of the reasons)**



Chap3Fig7

- **No blindness (Diabetes is one of the reasons)**



Chap3Fig8

- **No amputation of leg (Diabetes is one of the reasons)**

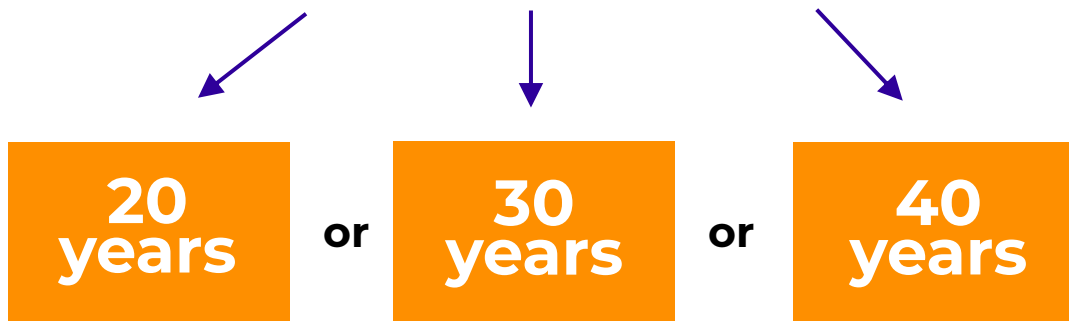


Chap3Fig9

Chapter 4

Yes, Diabetes management can really reduce complications

If we manage diabetes from day one or even before we have actual diabetes (called prediabetes),
Complication are dramatically delayed by



Is it true?

✓ Really Yes! it is True

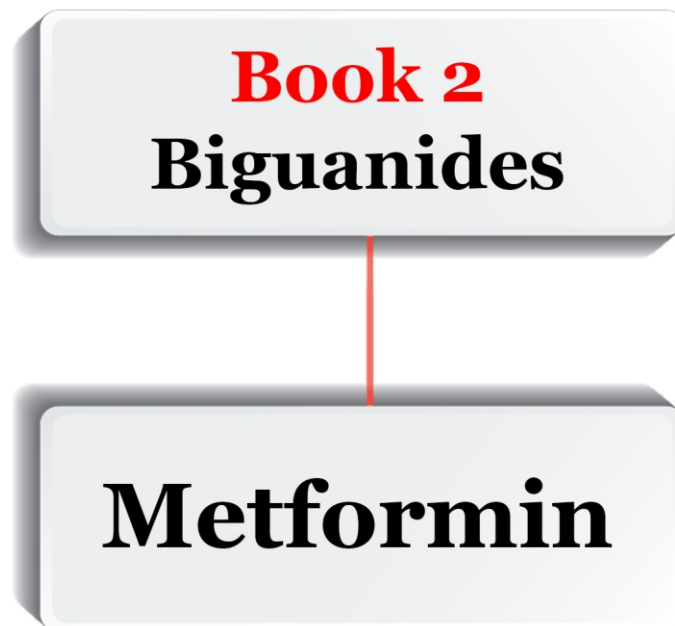
Chapter 5

Today in 2020/2021 we have excellent medicines available

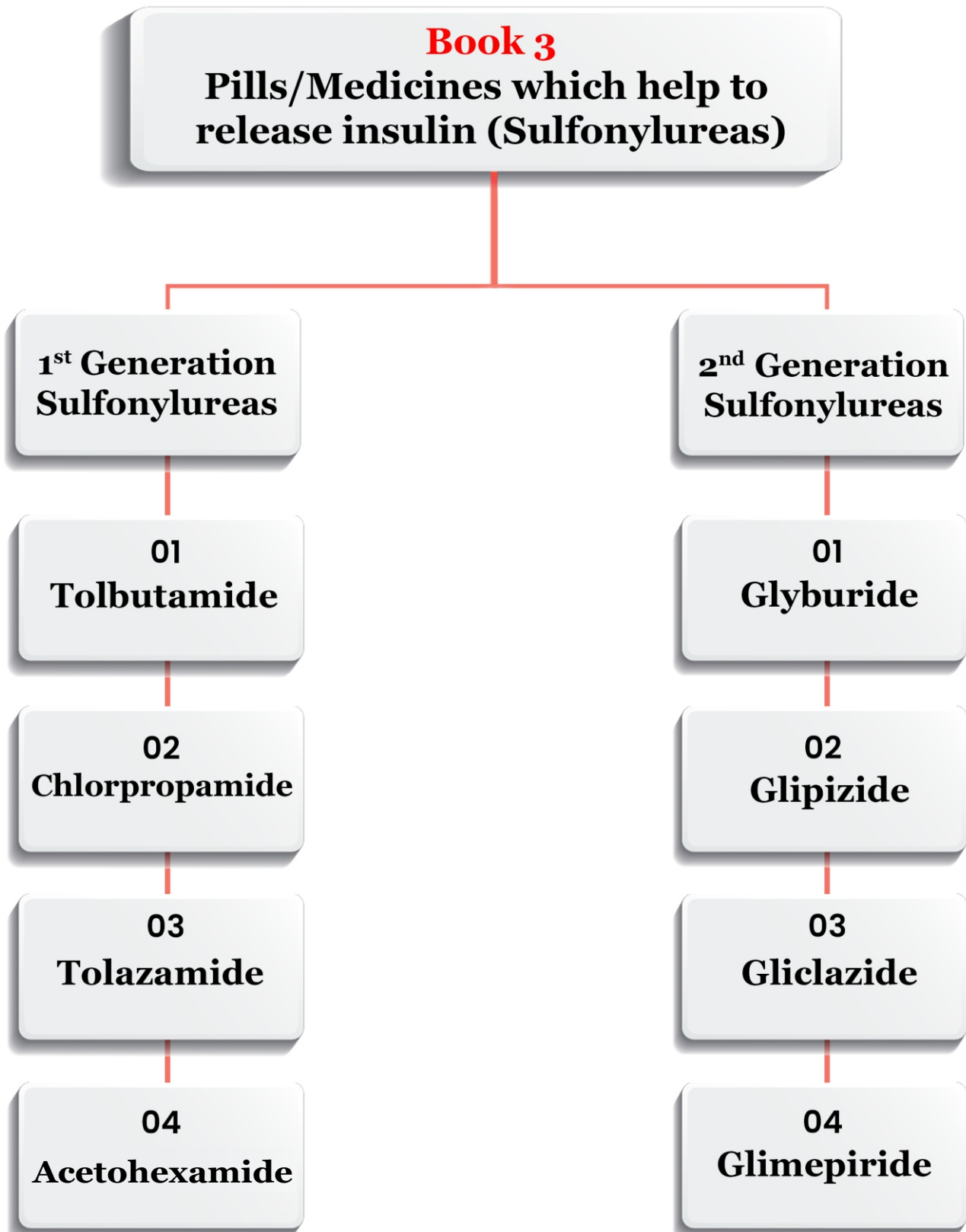
There are a number of medicines available in the market today for the treatment of Diabetes.
The main groups which these medicines belong to are:

Book-2 Biguanides

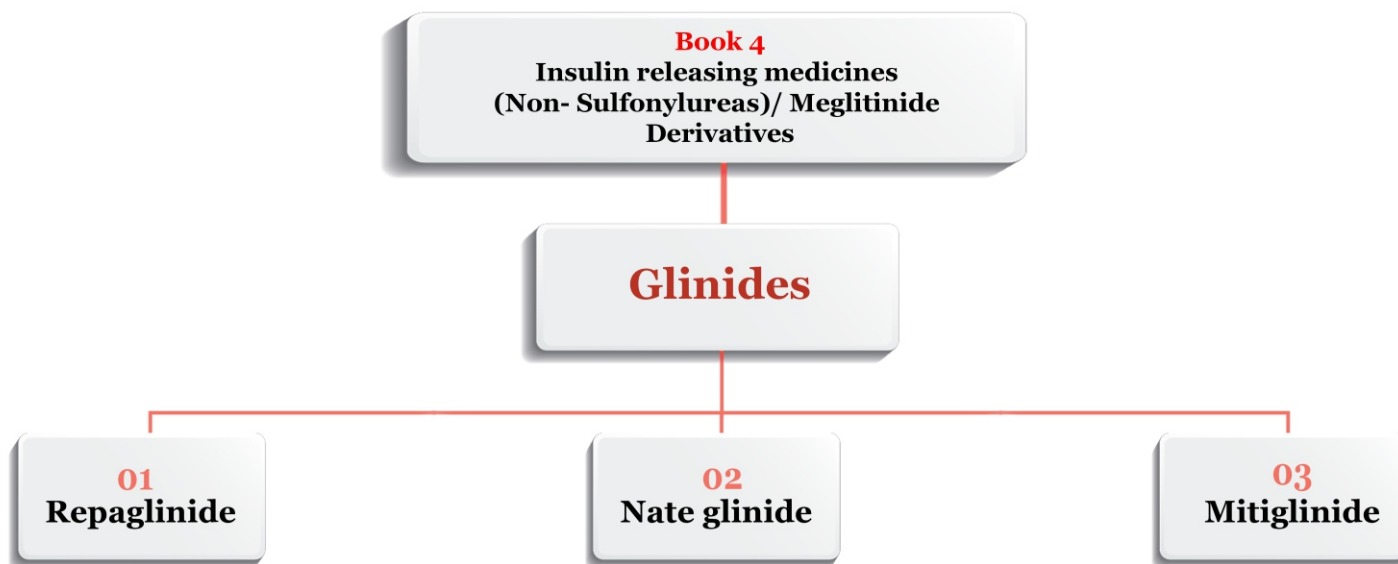
Metformin: The most famous and most used medicine and 1st medicine to start the treatment of diabetes.



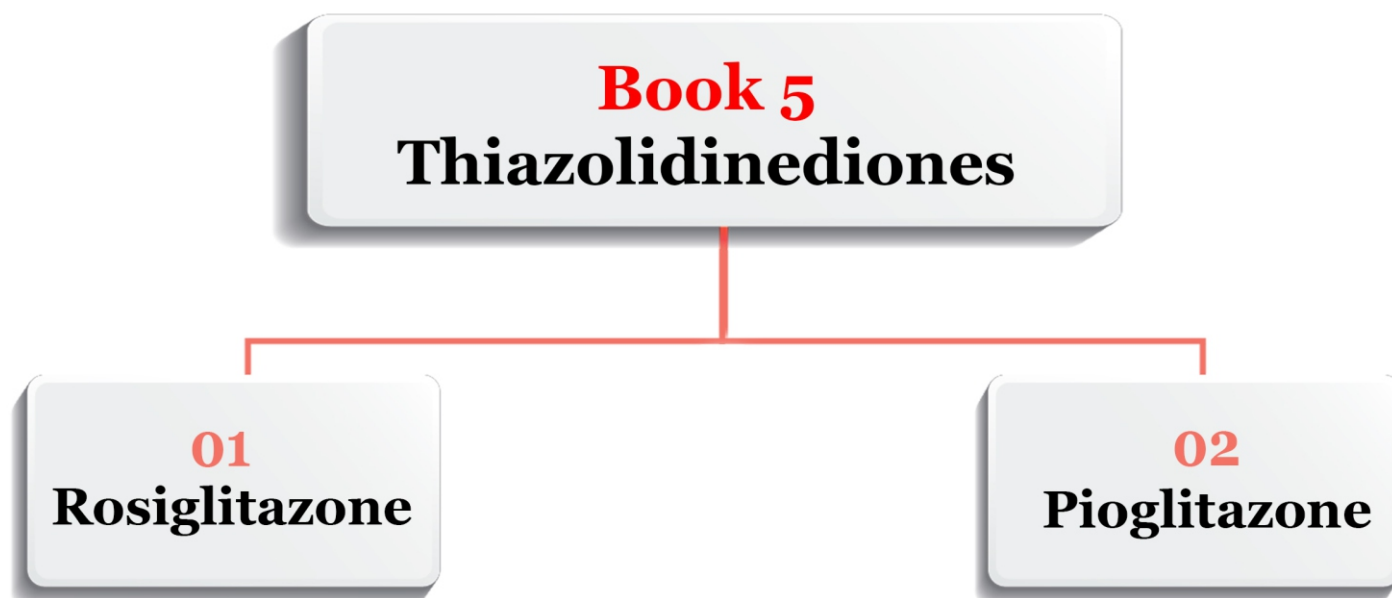
Book-3 Pills/Medicines which help to insulin (Sulfonylureas)



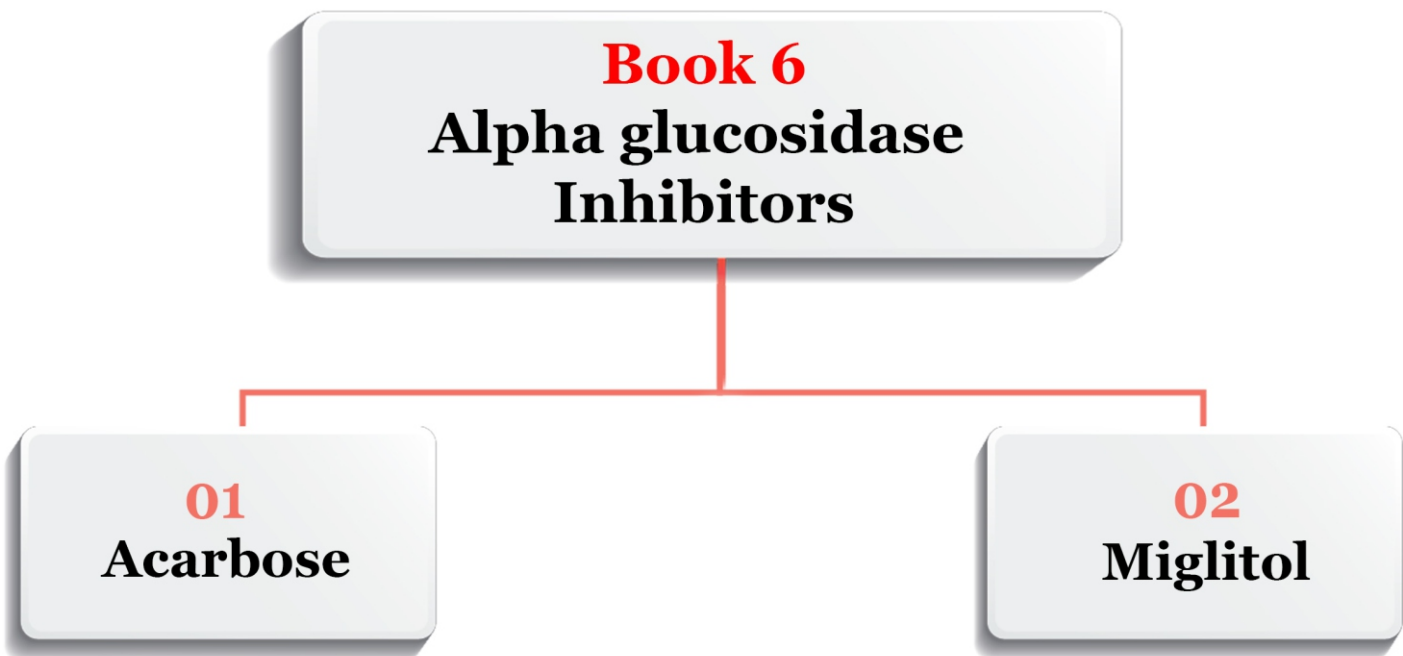
Book-4 Insulin releasing medicines (Non- Sulfonylureas)



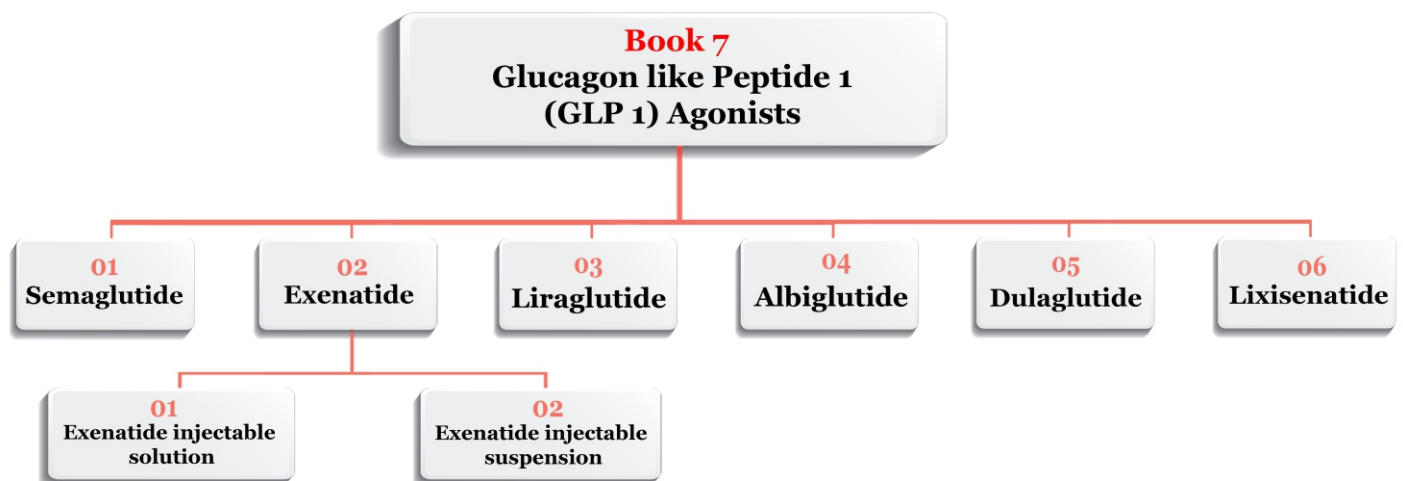
Book-5 Thiazolidinediones



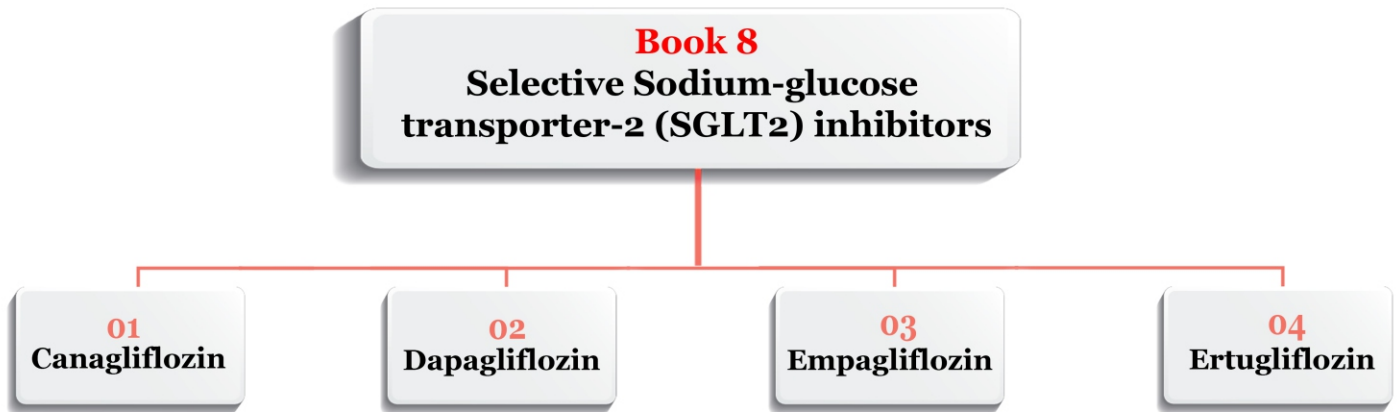
Book-6 Alpha glucosidase Inhibitors



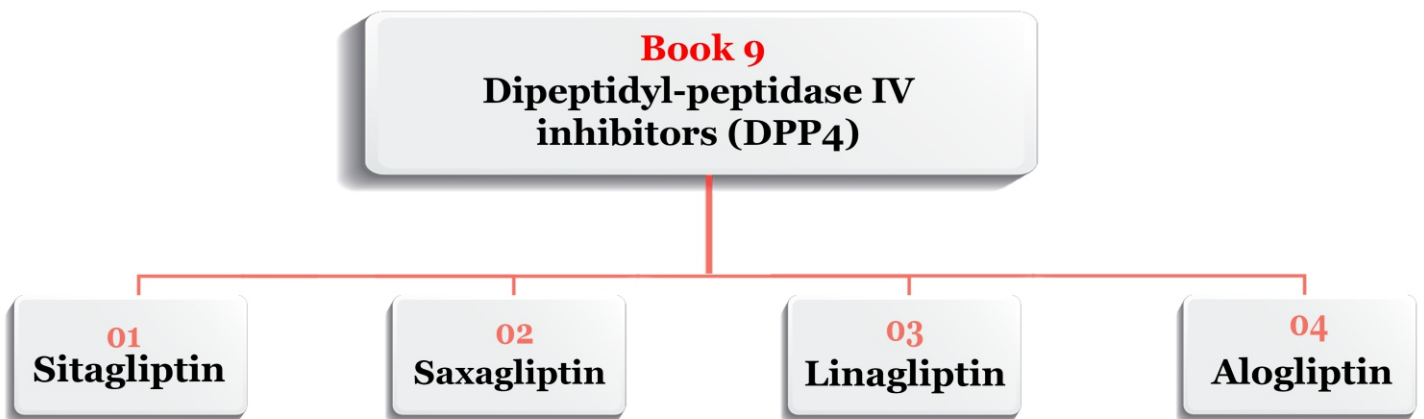
Book-7 Glucagon like Peptide 1 (GLP 1) Agnostics



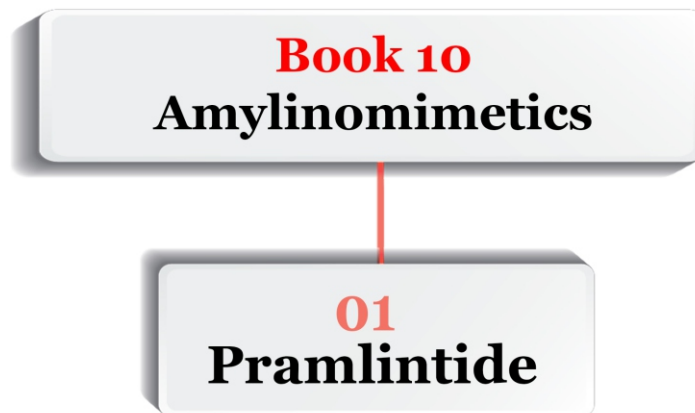
Book-8 Selective Sodium-glucose transporter-2 (SGLT2) inhibitors



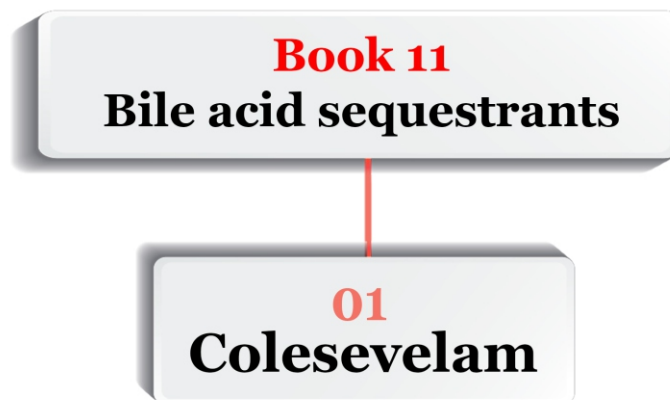
Book-9 Dipeptidyl-peptidase IV inhibitors (DPP4)



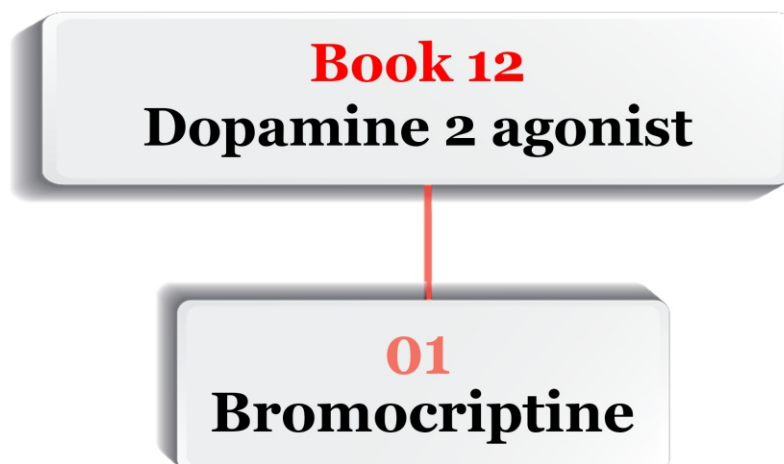
Book-10 Amylinomimetic group



Book-11 Bile acid sequestrants



Book-12 Dopamine 2 agonist



Chapter 6

There are dramatic advances in treatment of diabetes today in 2021

Think About It!

We are **NOT** perfect; we don't need to be. But we **CANNOT** quit trying either.

Every high sugar management prescription always includes:

1. Medicine(s),
2. Diet, and
3. Exercise

Without these, it is impossible to achieve our targets.

In our medical world, medicines can be given by

By mouth/oral
medication

or

By Injection below
our skin
(very easy to learn)



Chap6Fig1



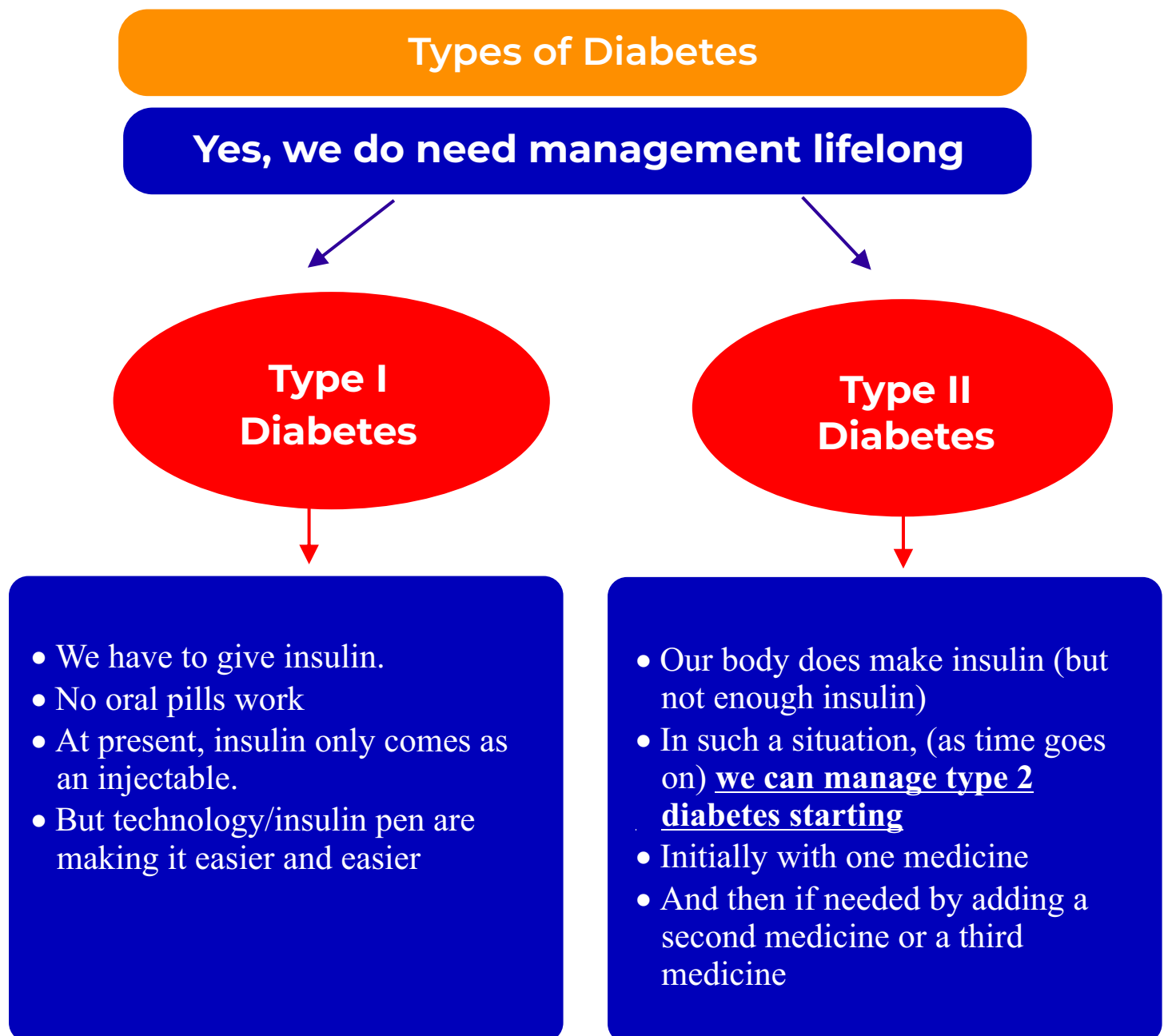
Chap6Fig2

Chapter 7

Type 1 vs Type 2 Diabetes

Think About It!

We were always scared of needles and injection needs some degree of training so that it does not lead to any infection on the injected place. We have to follow the sterile techniques that do not lead to any infection of the injection sites.



Chapter 8

How do we decide less dose or more dose of medicines

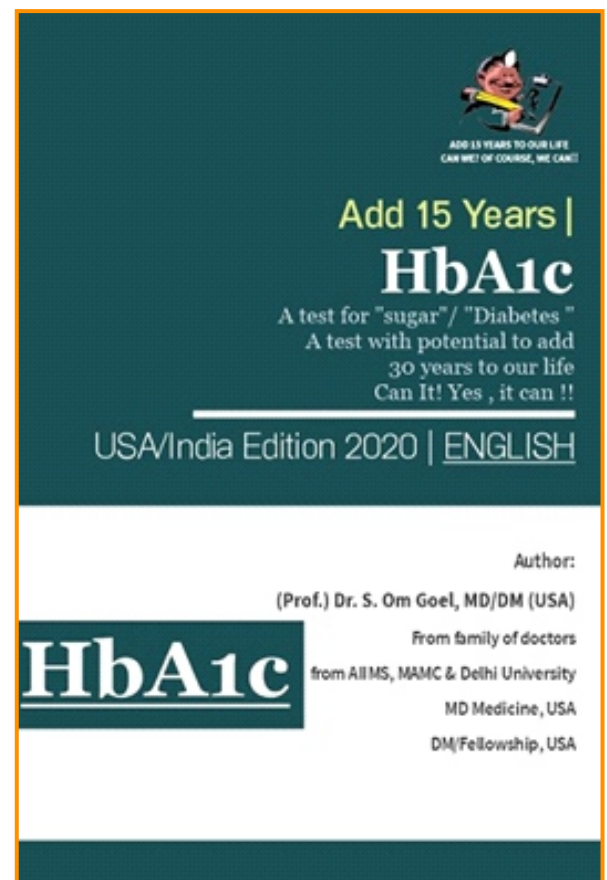
Think About It!

Our blood sugar changes all day based on

- *Our meals,*
- *Level of activity etc.*
- *HbA1c remains stable over three months.*

How do we decide less dose or more dose or combination of medicines?

I. We actually use HbA1c as our guideline for the treatment of diabetes.



Chap8Fig1

II. We set up a **target for HbA1c** in diabetic management and we want that the **HbA1c** **always remains 7 or less than 7.**

HbA1c < 7

III. **If we met our target,** we can lower the dose.

Start with one medicine, if blood sugar is not very high

IV. **If our HbA1c is high,** then we can give the increased dose or add a 2nd pill or add even a 3rd pill.

Start with one medicine, Add a second medicine, if needed And add a third medicine, if necessary

Chapter 9

Early diagnosis and early treatment: an absolute necessity in 2021

Think About It!

Every mom knows how her baby will start walking around in 1 year of age.

Every physician knows how to diagnose diabetes (called Prediabetes) year before you have any “symptoms”.

Actually, if we can diagnose Diabetes, even before it happens to us (called as Prediabetes), we can really delay complications as mentioned and it will be a very wise thing to do.

Most important thing we have to understand is that if medicines are taken early in the diagnosis of high blood sugar/diabetes then it can delay complications related to diabetes by





ADD 15 YEARS TO OUR LIFE
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Diabetes - Book 3.1

SULFONYLUREAS

(1st generation medicine)

IN 2021: No reason for kidneys to fail!!

Before 1921: Yes, You would have died.
(year of Nobel Prize for Insulin)

Chapter 1

Introduction to Sulfonylureas



Sulfonylureas

Chap1Fig1

Think About It!

Sulfonylureas Insulin secretagogues are a group of medicines which every doctor is very familiar with.

These medicines have been used for years and years.

When we were young back in 1970s-80s, we were using the 'first generation of sulfonylureas.'

As years went by, drug companies/pharmaceutical companies manufactured better acting medicines belonging to this group which we call 'second generation of sulfonylureas.'

Sulfonylureas

How do they work?

1. They **work by directly stimulating the release of insulin** from beta cells of Langerhans which lie in the pancreas
2. You can take these medicines with food or before food. They **lead to the lowering of blood glucose level** indirectly by stimulating the release of the insulin
3. They are **only useful for type 2 diabetes** where our beta cells in pancreas make some degree of insulin
4. These medicines do **lead to weight gain** which is the effect of the insulin released
5. And **they are very good medicines in lowering our blood sugar**

Release Insulin directly in Pancreases.

Lower the blood glucose level.

Only useful for Type 2 Diabetes.

Lead to weight gain.

Excellent medicines to lower blood sugar.

If we miss our meal or we take too much of the medicine, then it can lead to actually lower blood sugar than the normal and we have to be really careful about very low blood sugar.

Chapter 2

How to treat type 2 Diabetes?

Treatment of the type 2 diabetes always includes

So, we must educate as much as we can, the patient giving him as much insight into diabetes (high blood sugar).

- It is very important we talk about the lifestyle changes



Chap2Fig1

- We talk about the importance of diet



Chap2Fig2

- We talk about **the importance of exercising**



Chap2Fig3

- **Weight loss** always helps



Chap2Fig4

Chapter 3

Complications of suffering from Diabetes

Complications of diabetes

What are the complications of diabetes?

**Diabetes #1 cause of
Kidney Damage**

Because Diabetes is so common



Chap3Fig1

**Diabetes #1 cause of
Blindness**

Because Diabetes is so common



Chap3Fig2

Diabetes #1 cause of Nerve Problem

Because Diabetes is so common



Chap3Fig3

Diabetes #1 cause of Loss of Limbs

Because Diabetes is so common



Chap3Fig4

Diabetes #1 cause of Sexual Dysfunction

Because Diabetes is so common



Chap3Fig5

Diabetes #1 cause of Increased Risk of Heart Attack

Because Diabetes is so common



Chap3Fig6

Chapter 4

How to minimize the risk of Low Blood Sugar?

Sulfonylureas work by releasing insulin. Insulin lowers blood sugar but if our blood sugar is already low, it can make our sugar levels very, very low which is not safe for us.

It is important to know how to minimize risk of low blood sugar

- **Exercise which increases the utilization of the blood sugar.** If we take the medicine with heavy exercise, it can further lower the blood sugar



Chap4Fig1

- **We miss our meal.** We still take the medicine, but we do miss our meal. (We take our food, it raises the blood sugar and the medicines bring it down.)



Chap4Fig2

- Another thing is when **our medication starts**, we start with smaller doses and we carefully raise the medicine as needed.

These are long acting medicines which keep working for a long time



Chap4Fig3

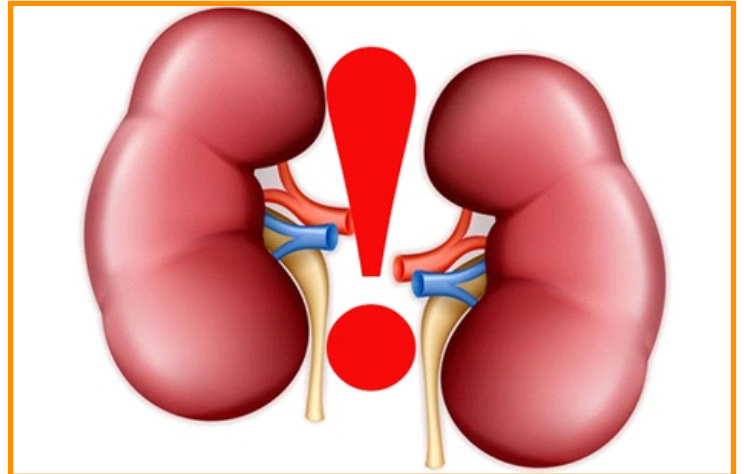
- If patients consume **too much alcohol then it leads to poor nutrition status** and affects the liver.

This affects the storage of glucose in our liver and one becomes very sensitive to low blood sugar



Chap4Fig4

- We have to understand that people with **kidney failure actually need less insulin** (as insulin stays longer in the blood.)



Chap4Fig3

- **Some medication can cause drug interaction** which decreases the effect of the medication. There is a risk of high blood sugar. If we take higher dose of medication once admitted to the hospital, then we must monitor our blood sugar levels and balance future doses



Chap4Fig4

Chapter 5

Introduction to First and Second Generation Sulfonylureas

All the second-generation sulfonylureas and first-generation sulfonylureas, are very potent (they lower blood sugar)

I. They are all metabolized by liver.

Metabolized By Liver

II. All medicines should be taken before meals

Taken Before Meals

III. All these medicines have a potential of causing low blood sugar if you miss your meal (as they keep lowering blood sugar)

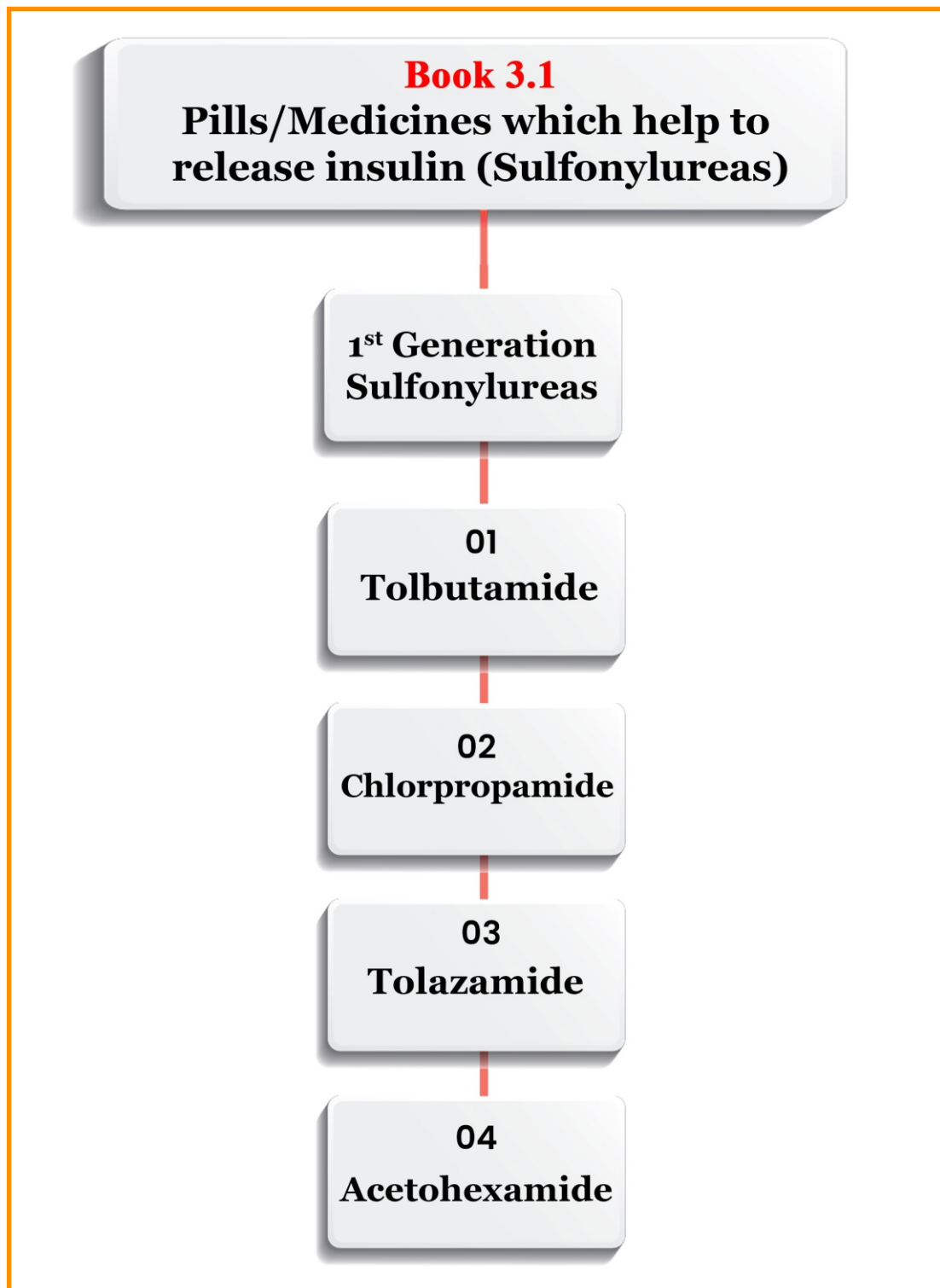
Causes Low Blood Sugar if Meal Missed

IV. Usually, we are careful while giving these to older people because older people are less tolerant to low blood sugar

Careful While Giving to Older People

Chapter 6

First Generation Sulfonylureas



Chap6Fig1

Orinase

Generic Name: Tolbutamide

- I. All diabetes medicines should be taken before meals as a golden rule.
- II. We start on a low dose and increase the dose if needed
- III. We should usually take medication at the same time every day.

Orinase FDA Approval History

FDA Approved: Yes (First approved May, 1957)

Brand name: Orinase

Generic name: Tolbutamide

Dosage form: Tablets

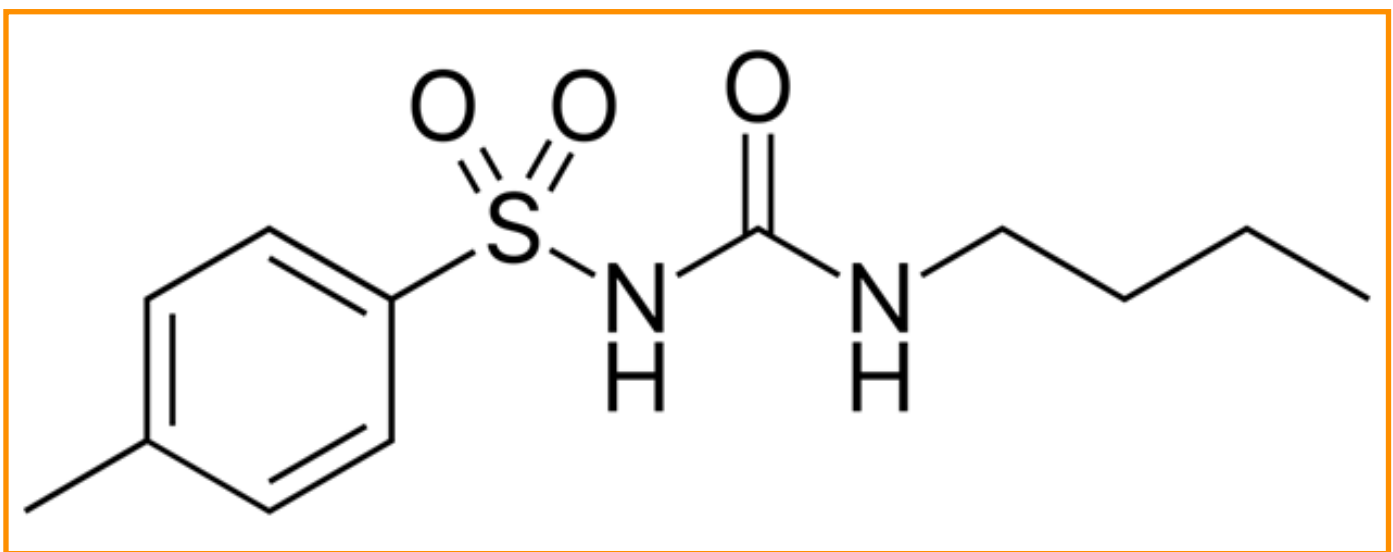
Treatment for: Diabetes - Type 2



Chap6Fig2

Orinase

Tolbutamide



Chap6Fig3

What we need to know about Tolbutamide (Orinase):

- It is a first-generation **sugar lowering potassium channel blocker**, sulfonylurea oral hypoglycemic medication

First generation sugar lowering medicine

- This drug may be used in the **management of type 2 diabetes** if diet alone is not effective

Manages Type 2 diabetes

- It stimulates the **secretion of insulin by the pancreas** and lowers blood sugar levels while helping the body use Insulin efficiently

Stimulates secretion of insulin to lower blood sugar

- It is used along with **diet and exercise**

Used with diet and exercise

- Available as **500 mg pill**, Daily Dose: **1gm-2gm once a day**

Usual dose- 1-2gm a day

- Maximum dose: Usually more than **2 gm is not needed**

Maximum Dose: 2gm a day

- Tolbutamide comes as a tablet to **take by mouth**

Taken by mouth

- It is usually taken **once a day in the morning**

Taken once a day

Trade Name– Dose– Cost in USA– Cost in India

ORINASE **(TOLBUTAMIDE)**

Please always combine any blood sugar medicine with diet and exercise.

All medicines continue life-long

Generic Name & Trade Name	About Orinase	Cost of Orinase for one month (in USA)	Cost of Orinase for one month (in India)
<p>Generic Name: Tolbutamide</p> <p>Trade Name: Orinase</p>	<ul style="list-style-type: none"> Usual dose: 1000mg daily Can be increased 2000mg As a Golden Rule – before starting any medicine, liver functions and kidney functions should be screened. 	<p>Dose = 2 times daily (500mg)</p> <p>1-month = 92 tablets</p> <p>Cost = \$85</p> <p>*All costs are meant for a rough estimate of one-month expense.</p>	<p>Dose = 2 times daily (500mg)</p> <p>1-month = 92 tablets</p> <p>Cost = Rs 65</p> <p>*All costs are meant for a rough estimate of one-month expense.</p>



Chap6Fig4

Diabinese

Generic Name: Chlorpropamide

- I. All diabetes medicines should be taken before meals as a golden rule.
- II. We start on a low dose and increase the dose if needed
- III. We should usually take medication at the same time every day.

Diabinese FDA Approval History

FDA Approved: Yes (First approved October, 1958)

Brand name: Diabinese

Generic name: Chlorpropamide

Dosage form: Tablets

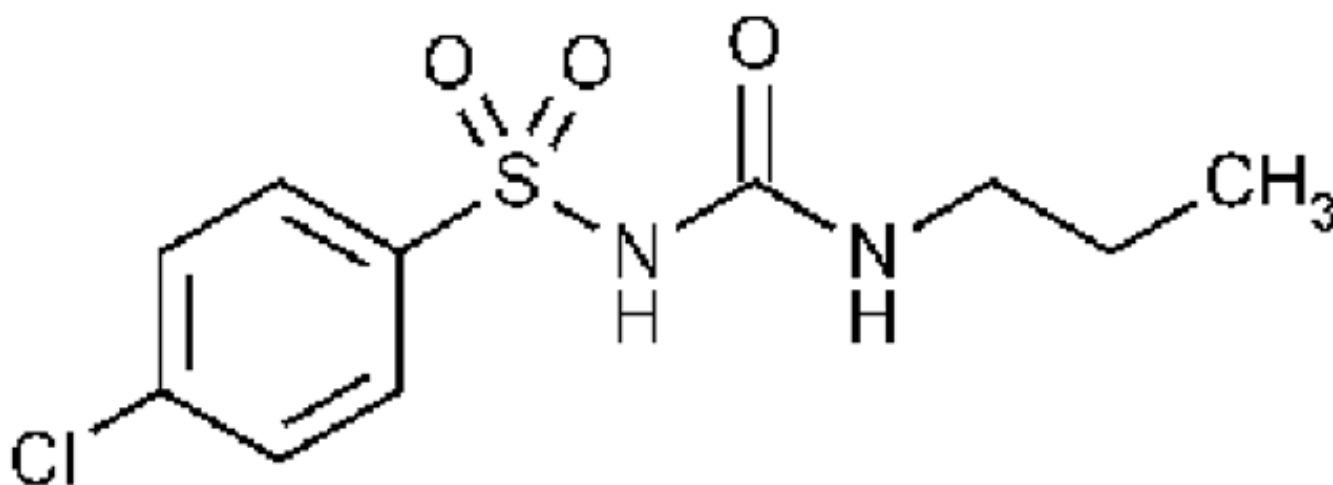
Treatment for: [Diabetes - Type 2](#)



Chap6Fig5

Diabinese

Chlorpropamide



Chap6Fig6

What we need to know about Chlorpropamide (Diabinese):

- It is a first-generation **sugar lowering potassium channel blocker**, sulfonylurea oral hypoglycemic medication

First generation sugar lowering medicine

- This drug may be used in the **management of type 2 diabetes** if diet alone is not effective

Manages Type 2 diabetes

- It stimulates the **secretion of insulin by the pancreas** and lowers blood sugar levels while helping the body use Insulin efficiently

Stimulates secretion of insulin to lower blood sugar

- It is used along with **diet and exercise**

Used with diet and exercise

- Available as **100 mg pill**, Daily Dose: **250gm once a day**

Usual dose- 250gm a day

- Maximum dose: Usually more than **250 gm is not needed**

Maximum Dose: 250gm a day

- Tolbutamide comes as a tablet to **take by mouth**

Taken by mouth

Trade Name– Dose– Cost in USA– Cost in India

DIABNESE (CHLORPROPAMIDE)

Please always combine any blood sugar medicine with diet and exercise.

All medicines continue life-long

Generic Name & Trade Name	About Diabnese	Cost of Diabnese for one month (in USA)	Cost of Diabnese for one month (in India)
<p>Generic Name: Chlorpropamide</p> <p>Trade Name: Diabnese</p>	<ul style="list-style-type: none"> Usual dose: 250mg once daily Can be increased 250mg As a Golden Rule – before starting any medicine, liver functions and kidney functions should be screened. 	<p>Dose = 250mg once a day</p> <p>1-month = 75 tablets</p> <p>Cost = \$69</p> <p>*All costs are meant for a rough estimate of one-month expense.</p>	<p>Dose = 250mg once a day</p> <p>1-month = 75 tablets</p> <p>Cost = Rs 25</p> <p>*All costs are meant for a rough estimate of one-month expense.</p>



Chap6Fig7

Tolinase

Generic Name: Tolazamide

- I. All diabetes medicines should be taken before meals as a golden rule.
- II. We start on a low dose and increase the dose if needed
- III. We should usually take medication at the same time every day.

Tolinase FDA Approval History

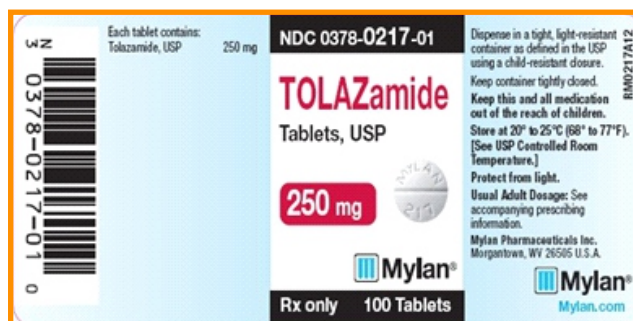
FDA Approved: Yes (First approved July, 1966)

Brand name: Tolinase

Generic name: Tolazamide

Dosage form: Tablets

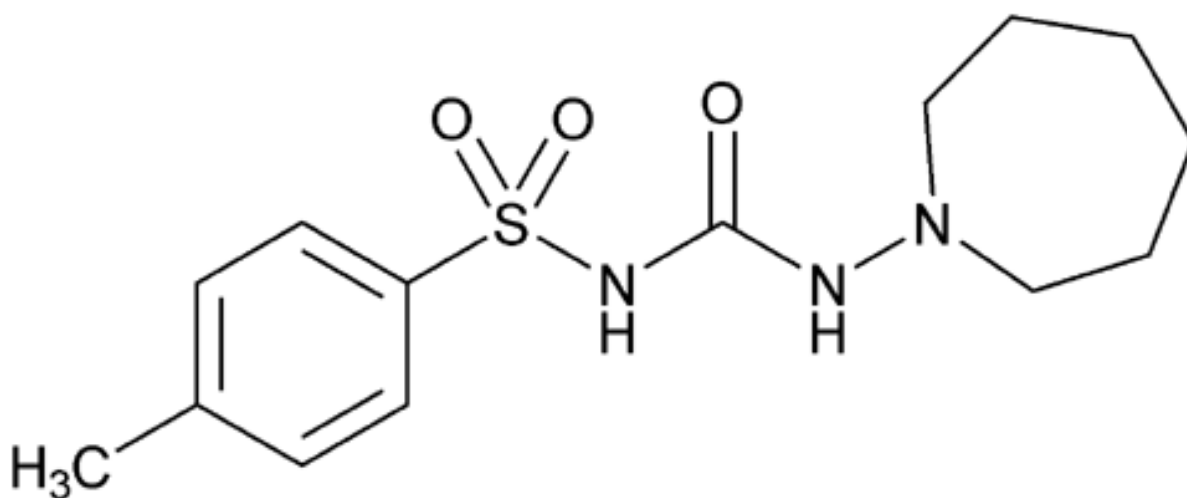
Treatment for: Diabetes - Type 2



Chap6Fig8

Tolinase

Tolazamide



Chap6Fig9

What we need to know about Tolazamide (Tolinase):

- It is a first-generation **sugar lowering potassium channel blocker**, sulfonylurea oral hypoglycemic medication

First generation sugar lowering medicine

- This drug may be used in the **management of type 2 diabetes** if diet alone is not effective

Manages Type 2 diabetes

- It stimulates the **secretion of insulin by the pancreas** and lowers blood sugar levels while helping the body use Insulin efficiently

Stimulates secretion of insulin to lower blood sugar

- It is used along with **diet and exercise**

Used with diet and exercise

- Available as **250 mg pill**, Daily Dose: **100gm once a day**

Usual dose- 100gm a day

- Maximum dose: Usually more than **250gm is not needed**

Maximum Dose: 250gm a day

- Tolbutamide comes as a tablet to **take by mouth**

Taken by mouth

Trade Name- Dose- Cost in USA- Cost in India

TOLINASE (TOLAZAMIDE)

Please always combine any blood sugar medicine with diet and exercise

All medicines continue life-long

Generic Name & Trade Name	About Tolinase	Cost of Tolinase for one month (in USA)	Cost of Tolinase for one month (in India)
<p>Generic Name: Tolazamide</p> <p>Trade Name: Tolinase</p>	<ul style="list-style-type: none"> Usual dose: 100 mg once a day Can be increased to 250 mg once a day As a Golden Rule – before starting any medicine, liver functions and kidney functions should be screened. 	<p>Dose = 100 mg</p> <p>1 month = 15 tablets</p> <p>Cost = \$9</p> <p>*All costs are meant for a rough estimate of one-month expense.</p>	<p>Dose = 100 mg</p> <p>1 month = 15 tablets</p> <p>Cost = Rs 2175</p> <p>*All costs are meant for a rough estimate of one-month expense</p>



Chap6Fig10

Dymelor

Generic Name: Acetohexamide

- I. All diabetes medicines should be taken before meals as a golden rule.
- II. We start on a low dose and increase the dose if needed
- III. We should usually take medication at the same time every day.

Dymelor FDA Approval History

FDA Approved: No longer in use

Brand name: Dymelor

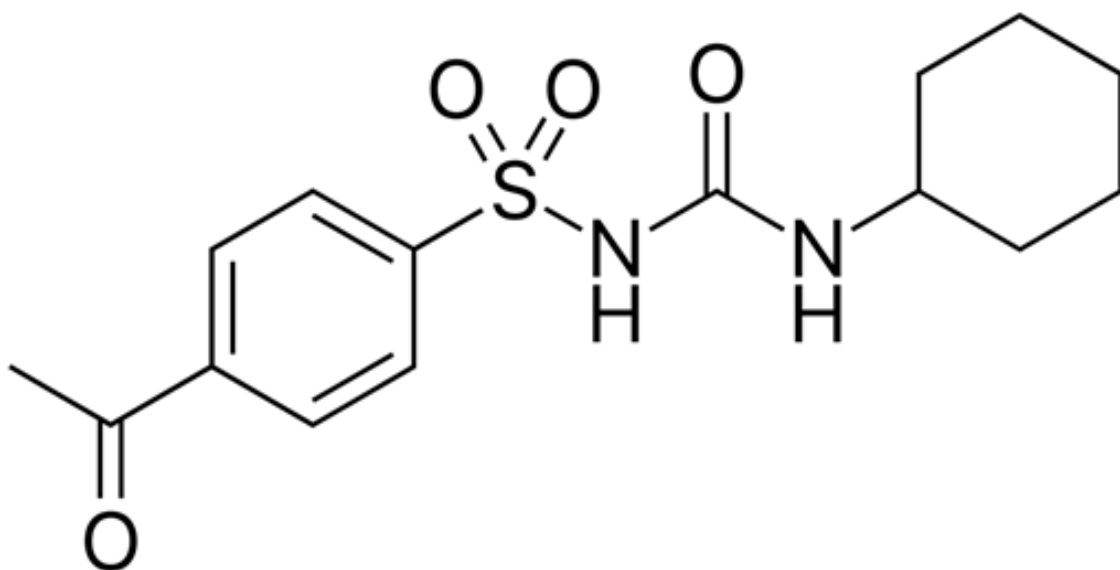
Generic name: Acetohexamide

Dosage form: Tablets

Treatment for: [Diabetes - Type 2](#)

Dymelor

Acetohexamide



Chap6Fig11

What we need to know about Acetohexamide (Dymelor):

- It is a first-generation **sugar lowering potassium channel blocker**, sulfonylurea oral hypoglycemic medication

First generation sugar lowering medicine

- This drug may be used in the **management of type 2 diabetes** if diet alone is not effective

Manages Type 2 diabetes

- It stimulates the **secretion of insulin by the pancreas** and lowers blood sugar levels while helping the body use Insulin efficiently

Stimulates secretion of insulin to lower blood sugar

- It is used along with **diet and exercise**

Used with diet and exercise

- **Not used anymore as better medicines** are available in the market

Not used anymore

- Acetohexamide comes as a tablet to **take by mouth**

Taken by mouth

This medicine is no longer used as better medicines are available in the market.