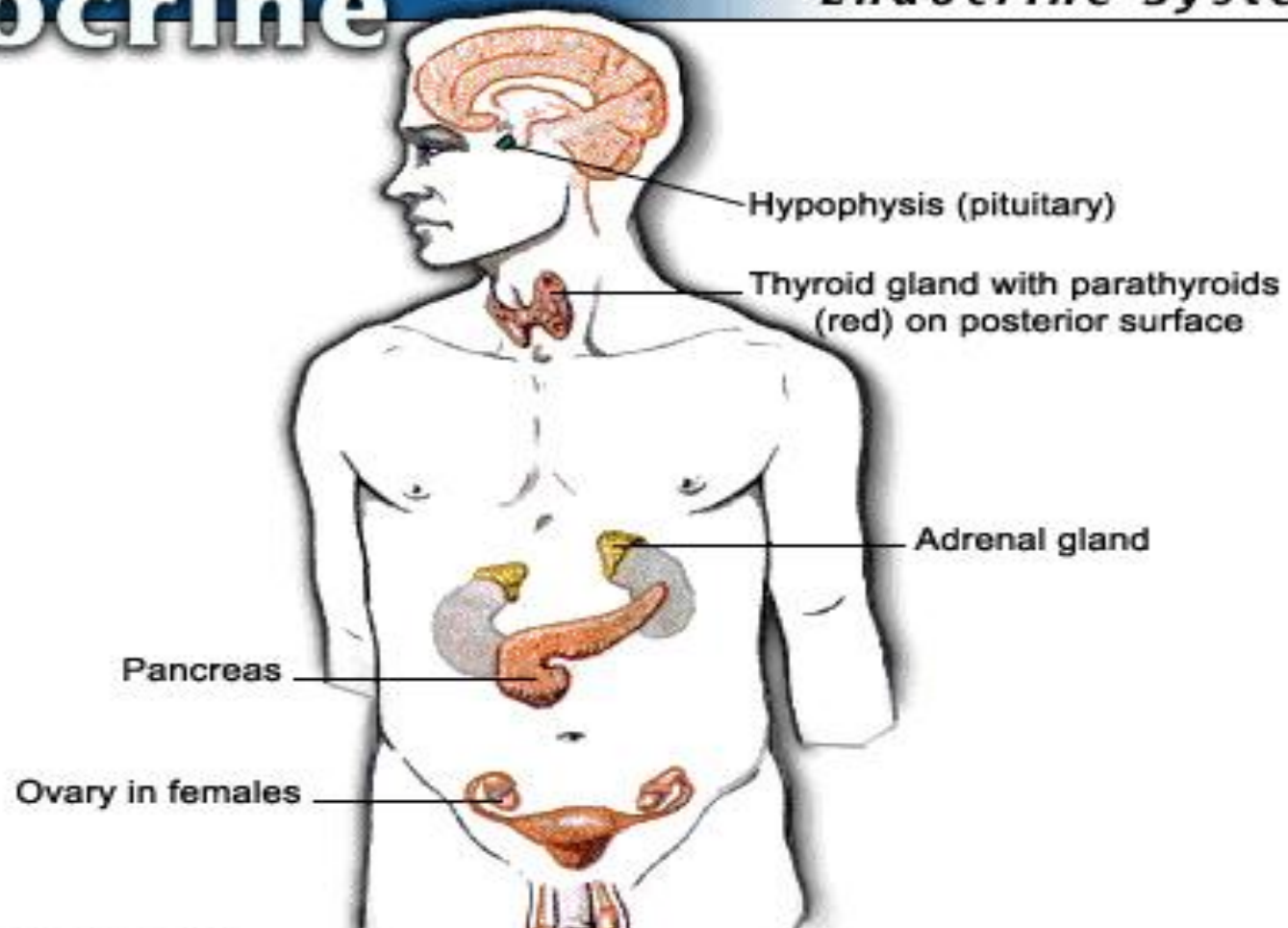
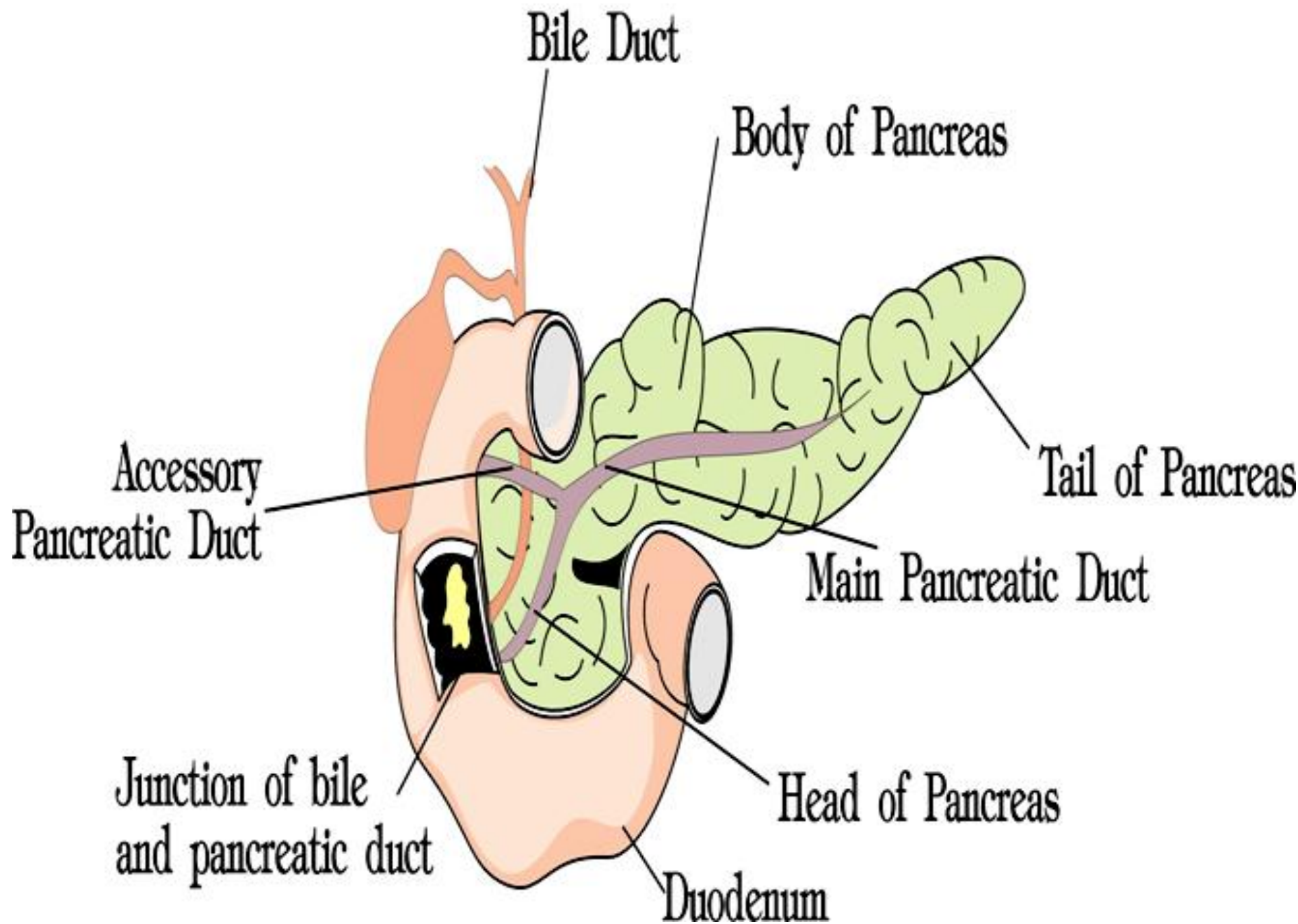


DIABETES IS A DISEASE WHERE THE
BODY DOES NOT PRODUCE OR
PROPERLY USE INSULIN.

Endocrine

Endocrine System



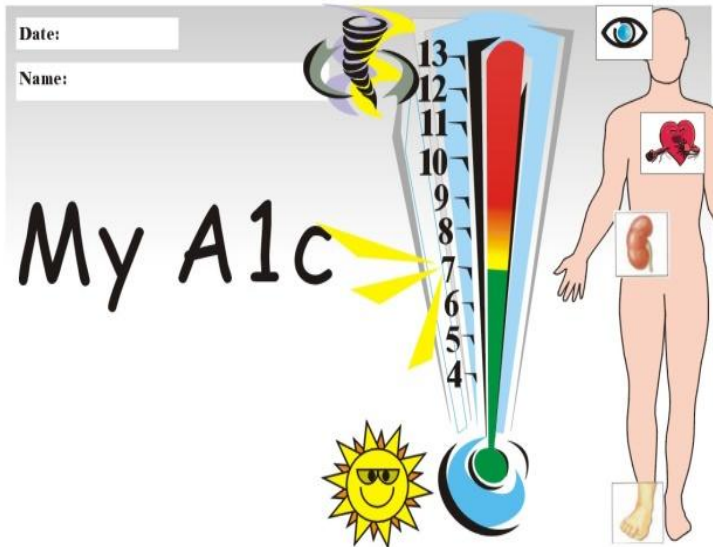


Targets

- Fasting Blood Sugar : Less than 120
- Post lunch blood sugar : Less than 160

Target

HbA1C < 7%



- **Good control < 7%**
- Fair control 7- 8 %
- **Poor control > 8 %**

Targets

- Blood Pressure
- Less than 130/80

Targets

- **Cholesterol**
 - **Less than 200 mg/dl**
- **LDL**
 - **Less than 100 mg/dl**
- **Triglycerides**
 - **Less than 200 mg/dl**
- **HDL**
(good cholesterol)
 - **More than 40 mg/dl**

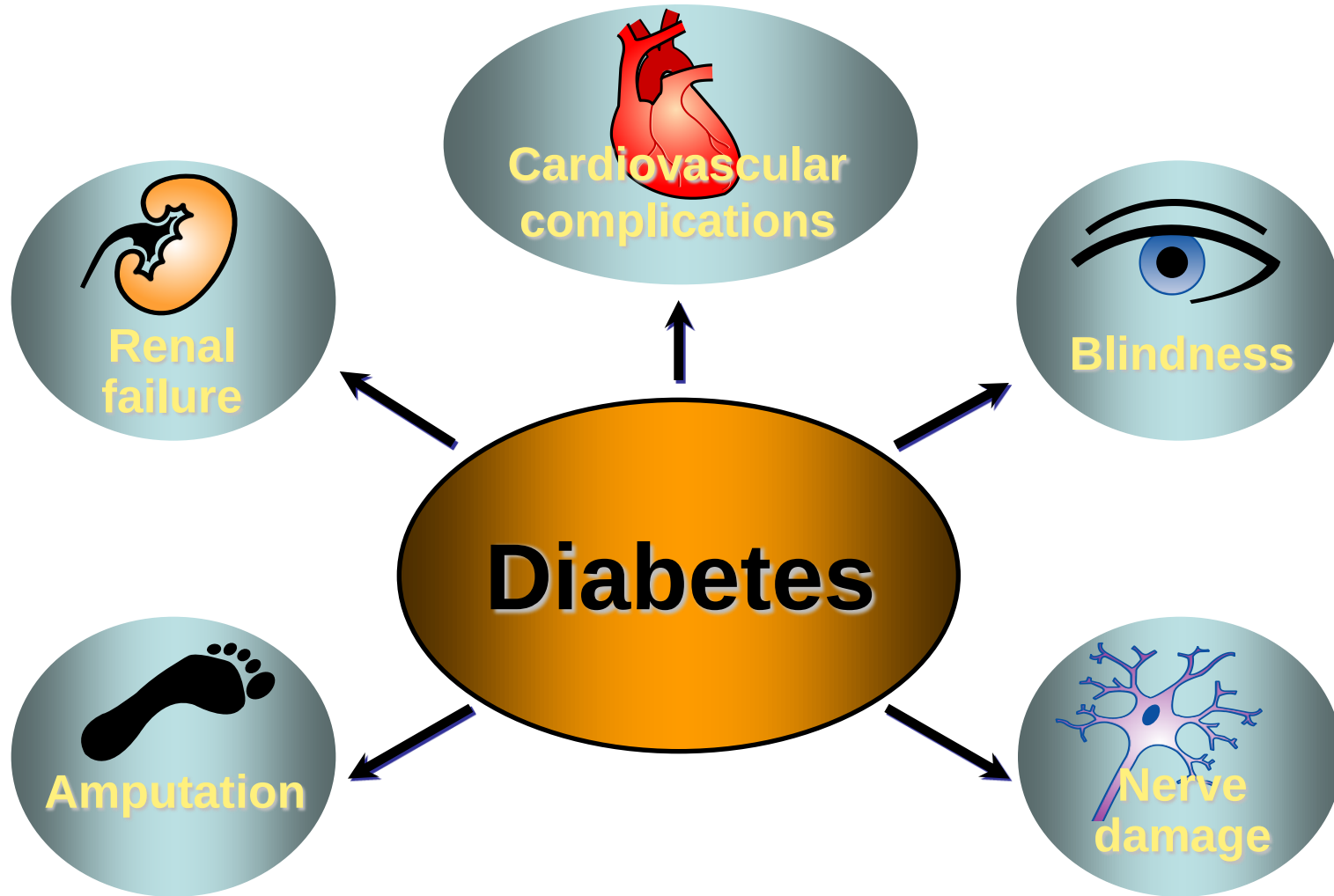
Slow poisons

- Sugar

- BP

Cholesterol

Complications of Diabetes



Managing diabetes

Everything is in your hands...

Exercise

Diet control



Medicine

Testing

(Blood sugar,
Cholesterol,
Eyes, Kidney,
ECG)

No sweets / sugar / Honey

- r



Tea/Coffee without sugar



Artificial sweeteners, permitted in moderate quantity



No Fruit Juice



No soft drinks



Permitted



Breakfast just like other family members



Healthy snacks



Rice & Roti both 50/50%



Fruits to avoid



Fruits to eat, any one



Vegetables all allowed



Vegetable juice, permitted



Roots & Tubers

Eat in moderation, mix with other vegetables



Avoid junk, fatty food and bakery products



Restrict Oily Food



Restrict Non veg food

- Fish better than chicken,
- chicken better than mutton
- Over all reduce intake by 50%
- Restrict more if you have heart / kidney disease



How much oil to consume?

Rotate oil monthlywise



$\frac{1}{2}$ Lit per
person per
month



Tender coconut,
once in a while



Eat better, eat less, eat in time
Fight obesity, Prevent Diabetes



Types of Exercises

Cycling



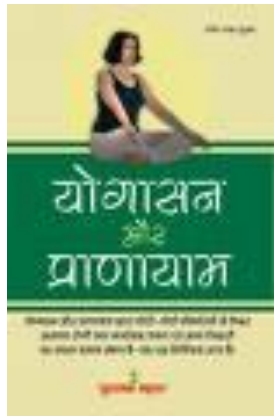
Walking



Jogging



Treadmill



Walley ball



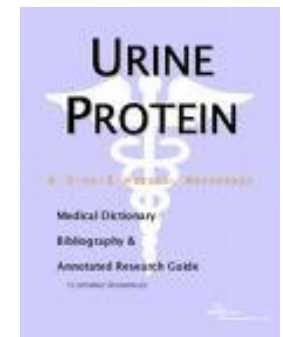
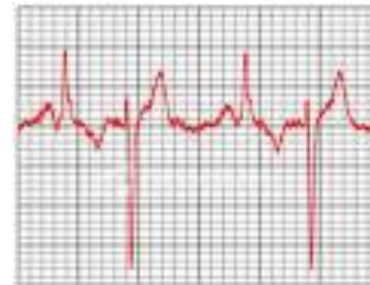
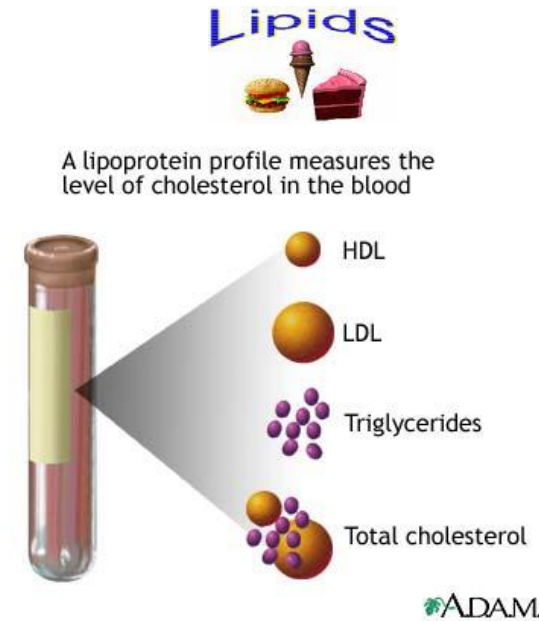
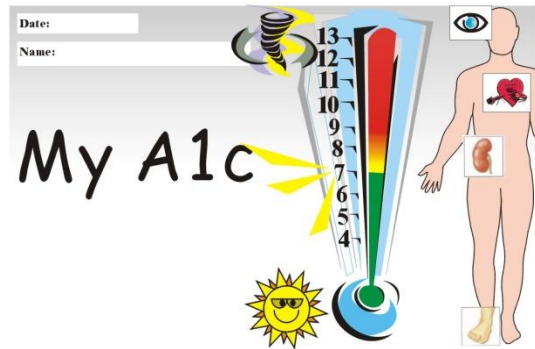
Swimming



Sit ups



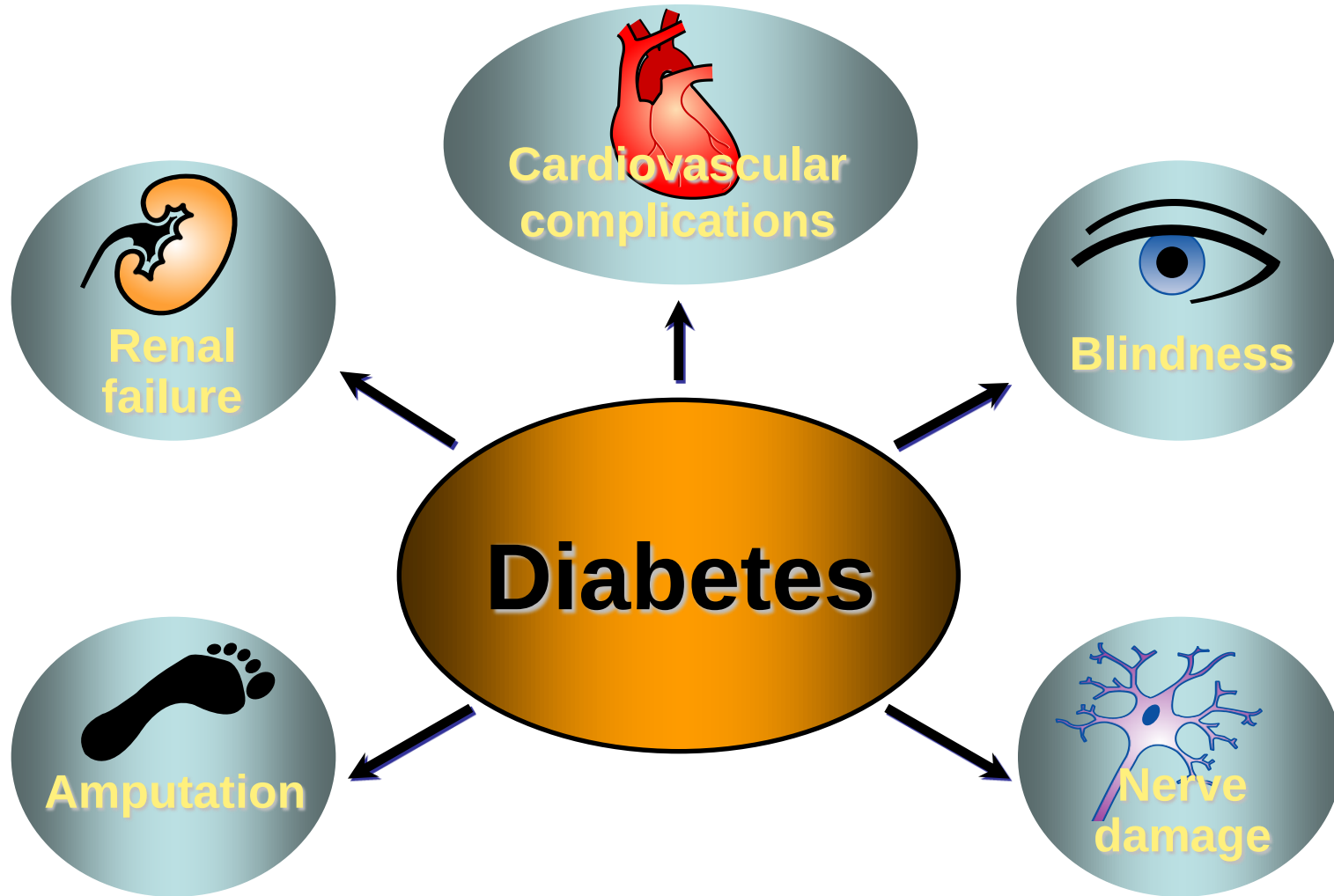
Monitoring



Message

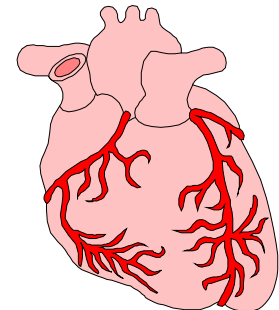
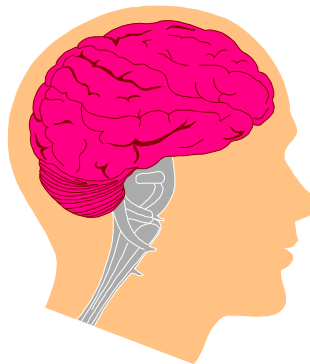
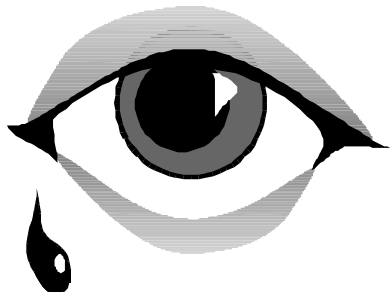
- **You respect your diabetes,
Diabetes will respect you**
- **You neglect your diabetes,
Your diabetes will neglect
you**

- A Diabetic Patient



Why to control Diabetes ?

- If not controlled Diabetes can lead to serious complications of eyes, kidneys, heart, nervous system.
- Therefore, diabetes needs to be controlled strictly.



Complications of Diabetes

Eye Diseases: Retinopathy

What you can do to Preserve your Vision

Fortunately, retinopathy can be prevented
and controlled

- Practice tight control.
- Get an eye exam every year.
- Reduce your blood pressure.



b



NPDR

Severe NPDR

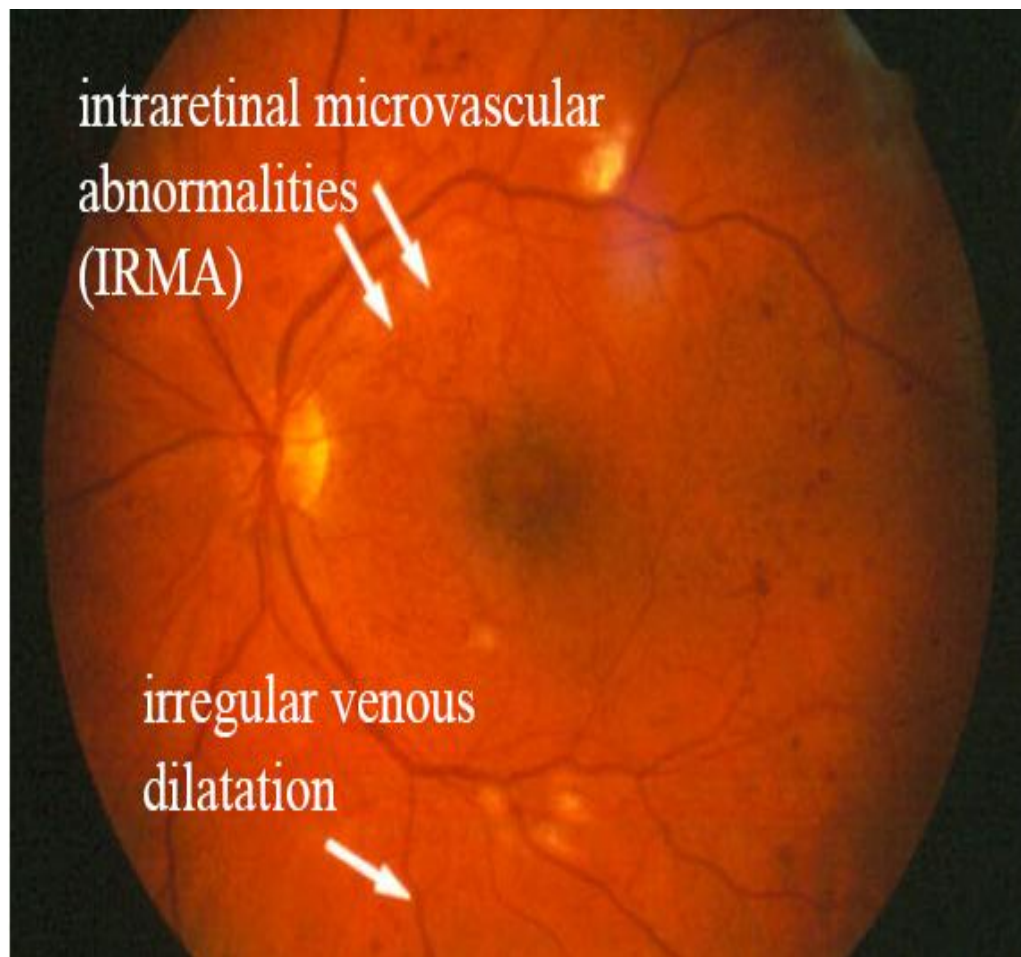
Any of the following:

≥ 20 Intraretinal hemorrhages
in 4 quadrants

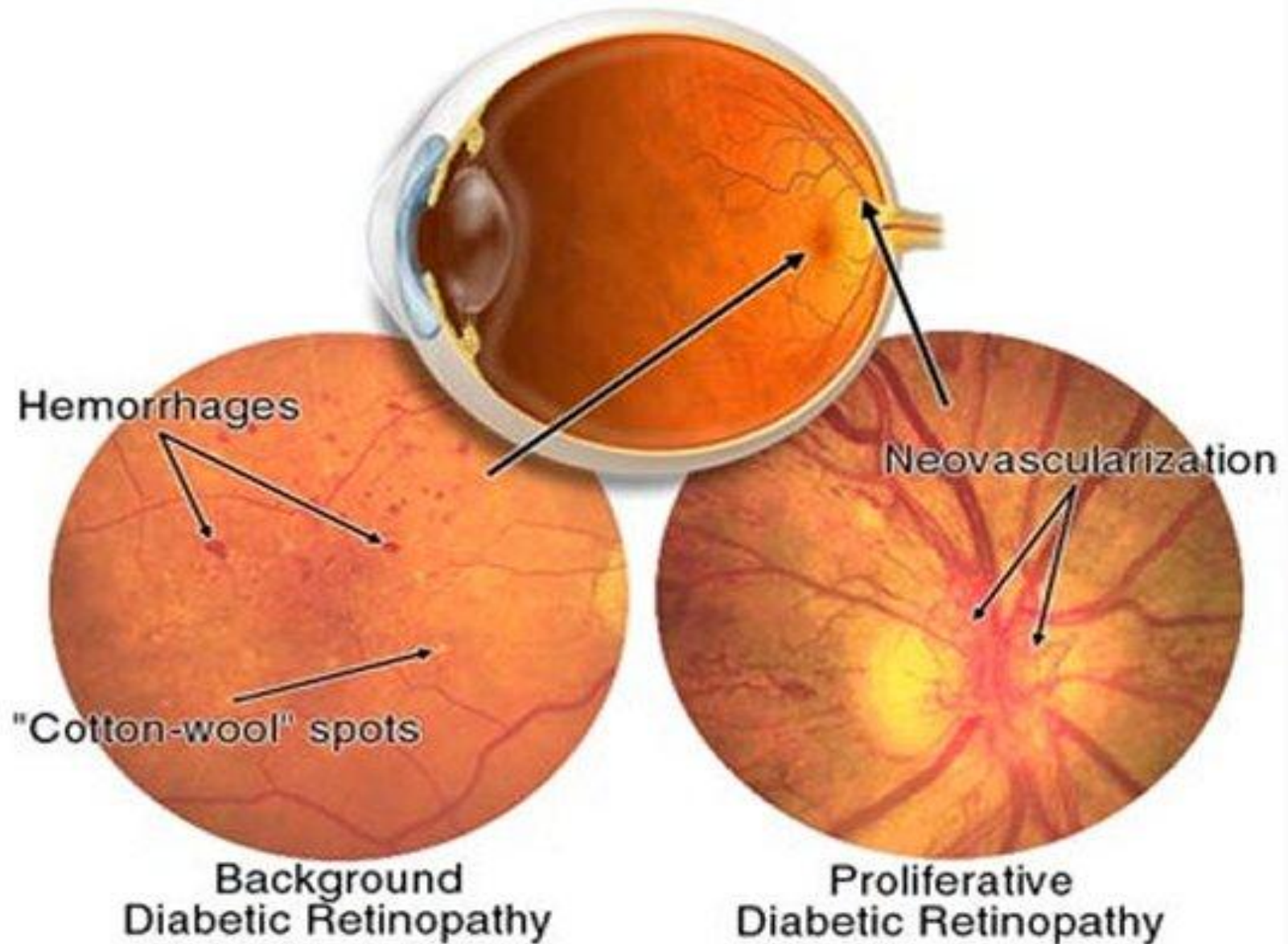
Definite venous beading in
 ≥ 2 quadrants

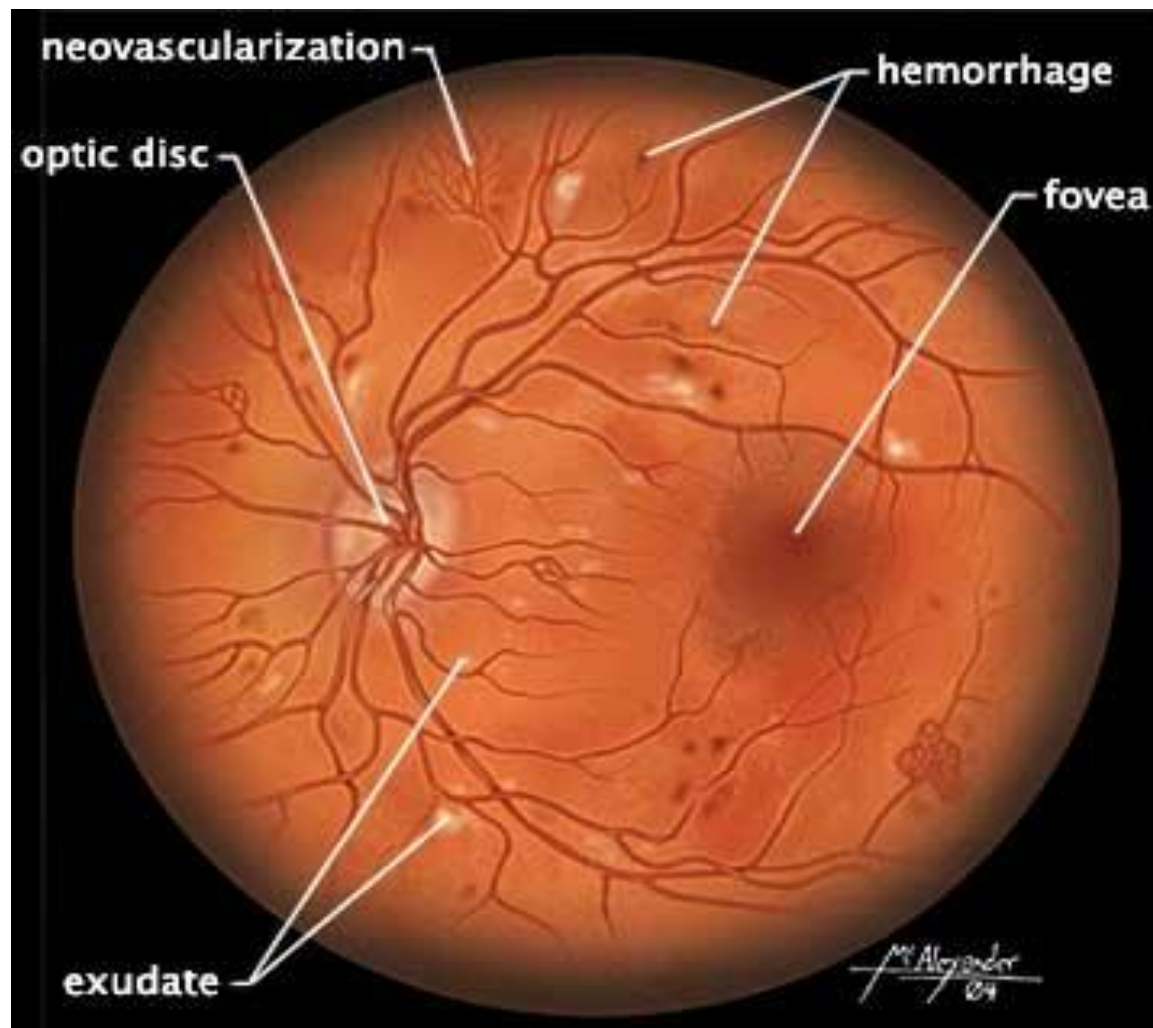
Prominent IRMA in ≥ 1
quadrants and no
neovascularization

Very Severe NPDR
 ≥ 2 of above

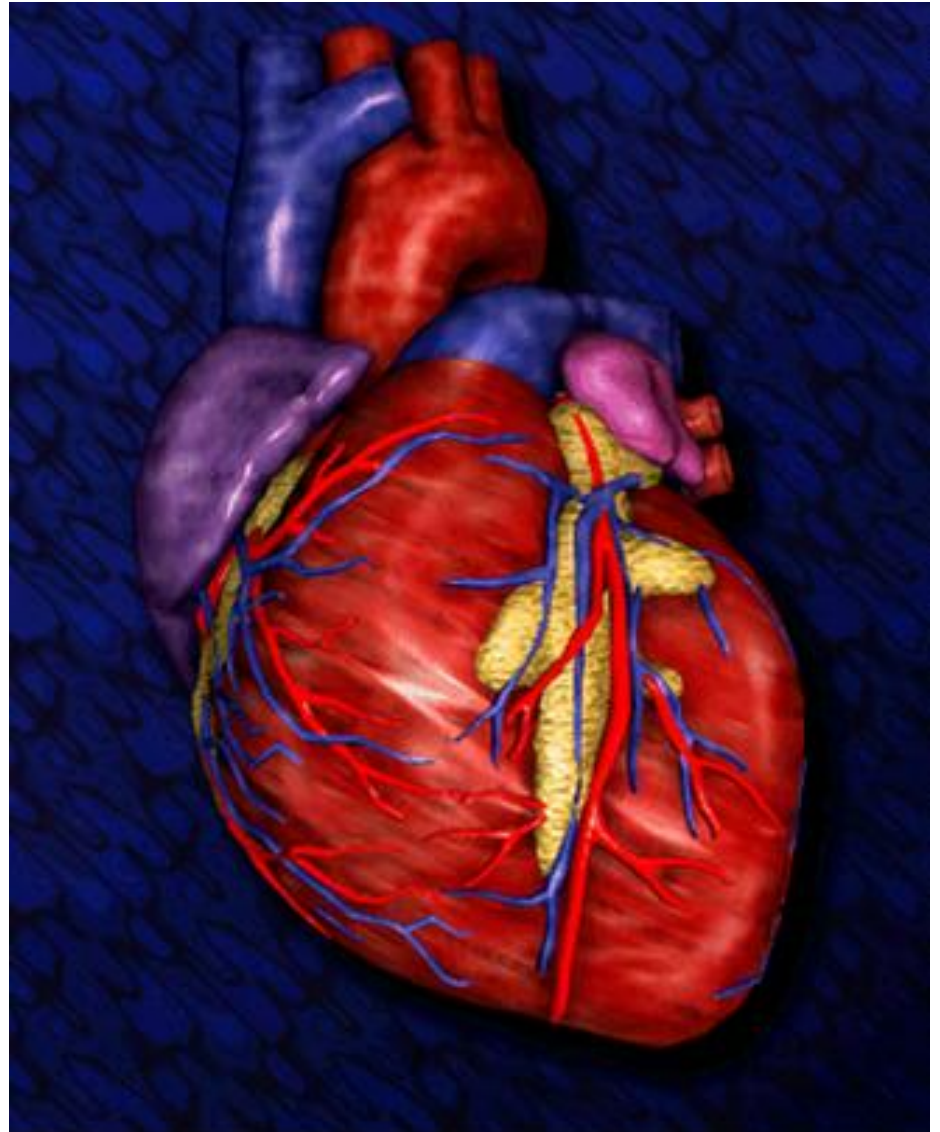


Diabetic Retinopathy



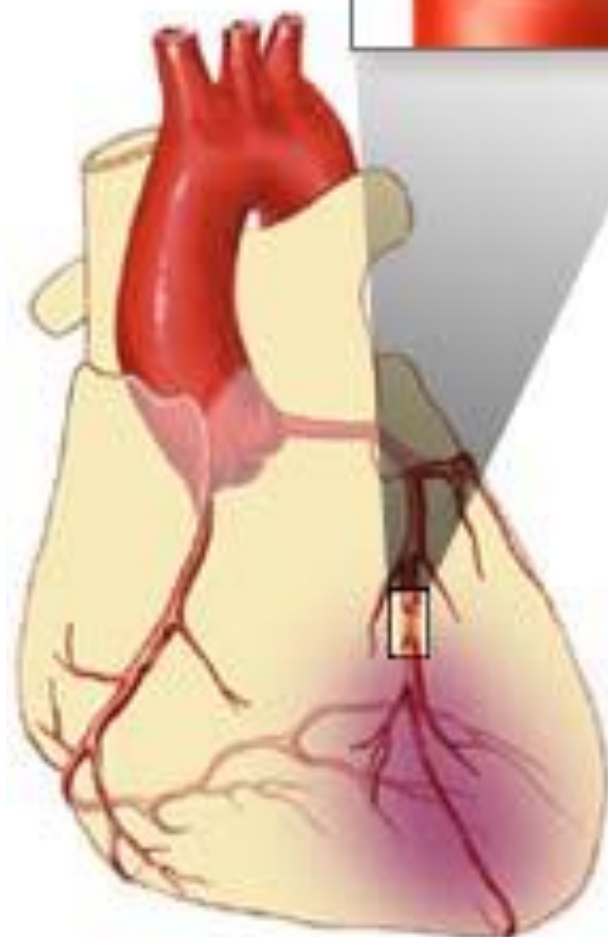


- 80% of diabetic patients die of cardiovascular disease
- 75% Heart disease, 25% Brain Stroke
- Heart disease 2-3 times more
- MI equivalents

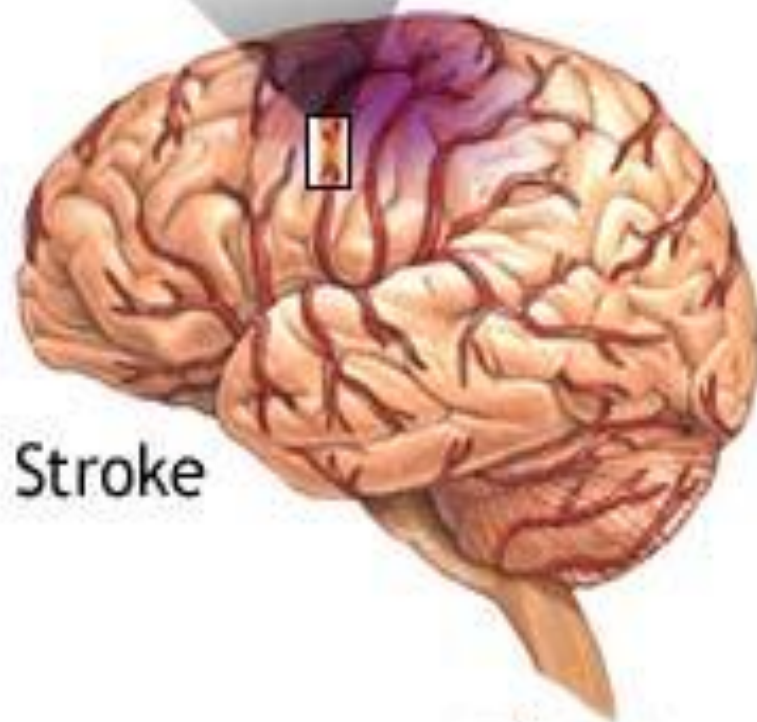




Blood
flow
blocked
by plaque



Heart
attack



Stroke



Intrinsic - Minus Foot



Sign of Motor Neuropathy





Hammer toe



Burion

- The best way to prevent neuropathy is to practice tight blood glucose control.







5-15-2018
15-2-2018



**Oedema
of Legs**

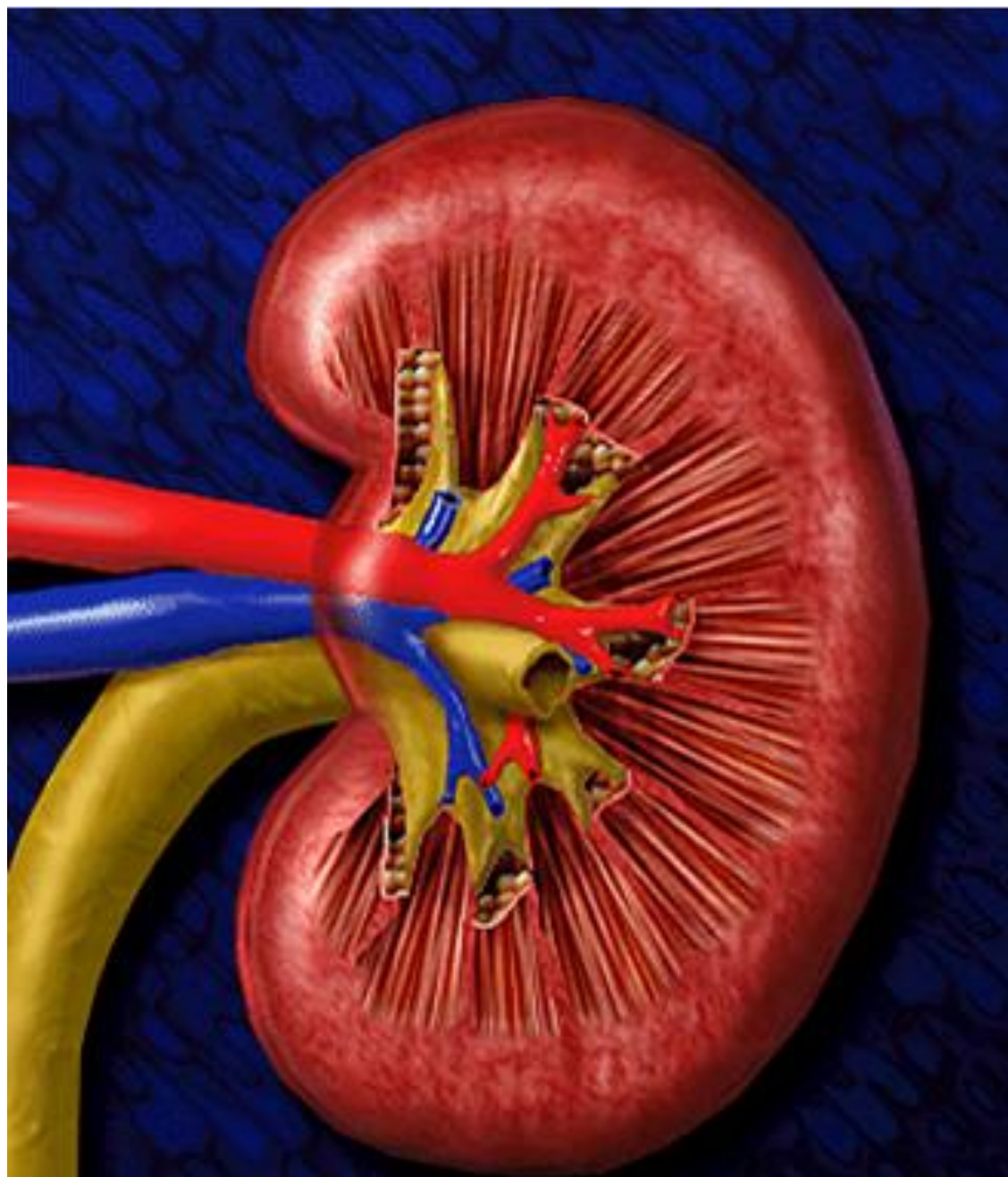
Role of Surgery

Skin grafting

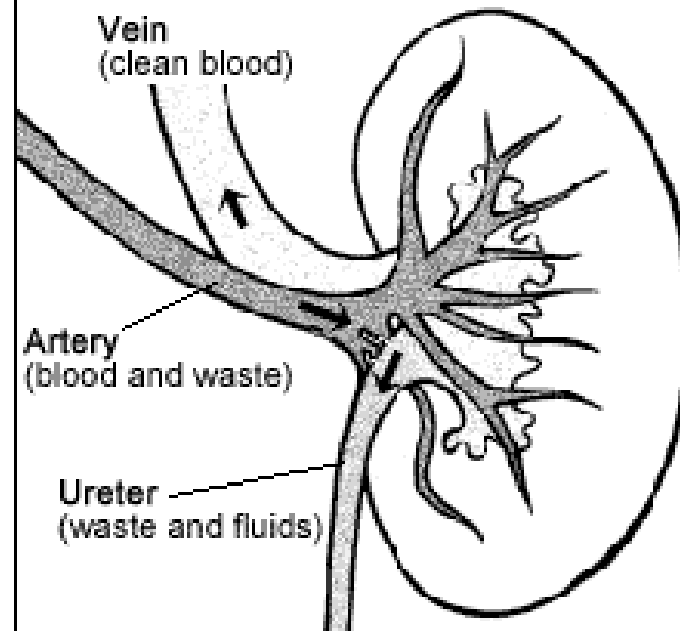


Late presentation

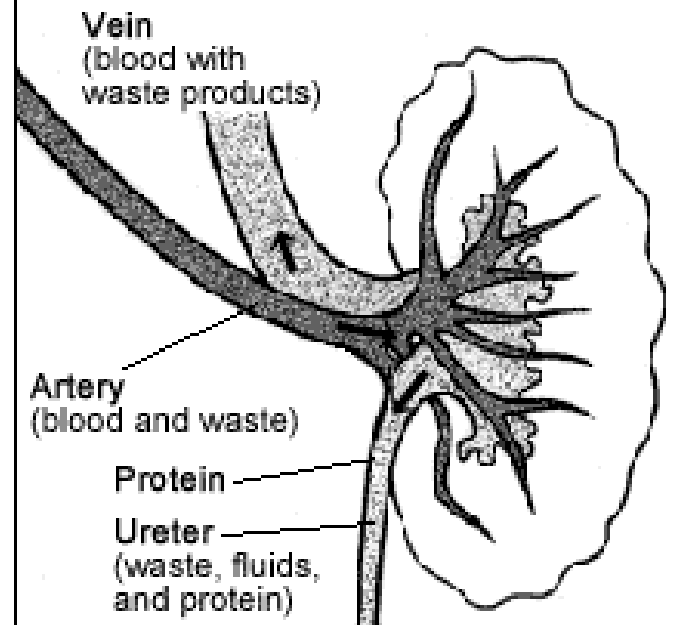


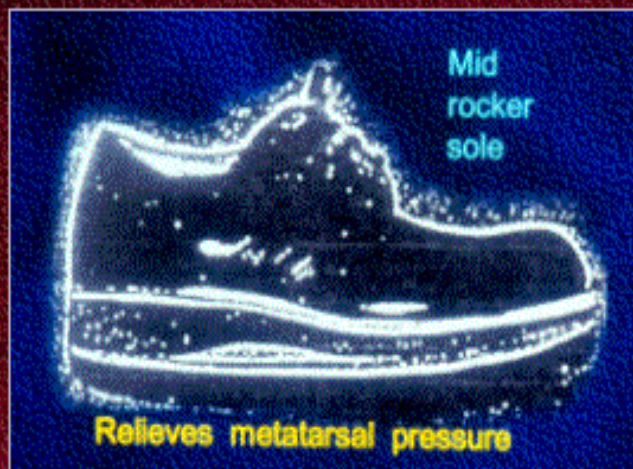


Healthy kidney

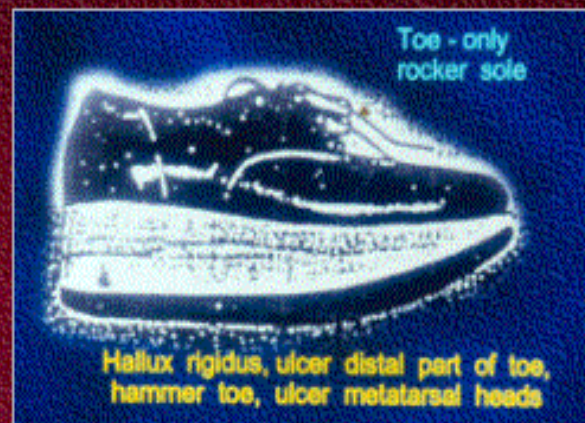


Unhealthy kidney





Mid-rocker sole



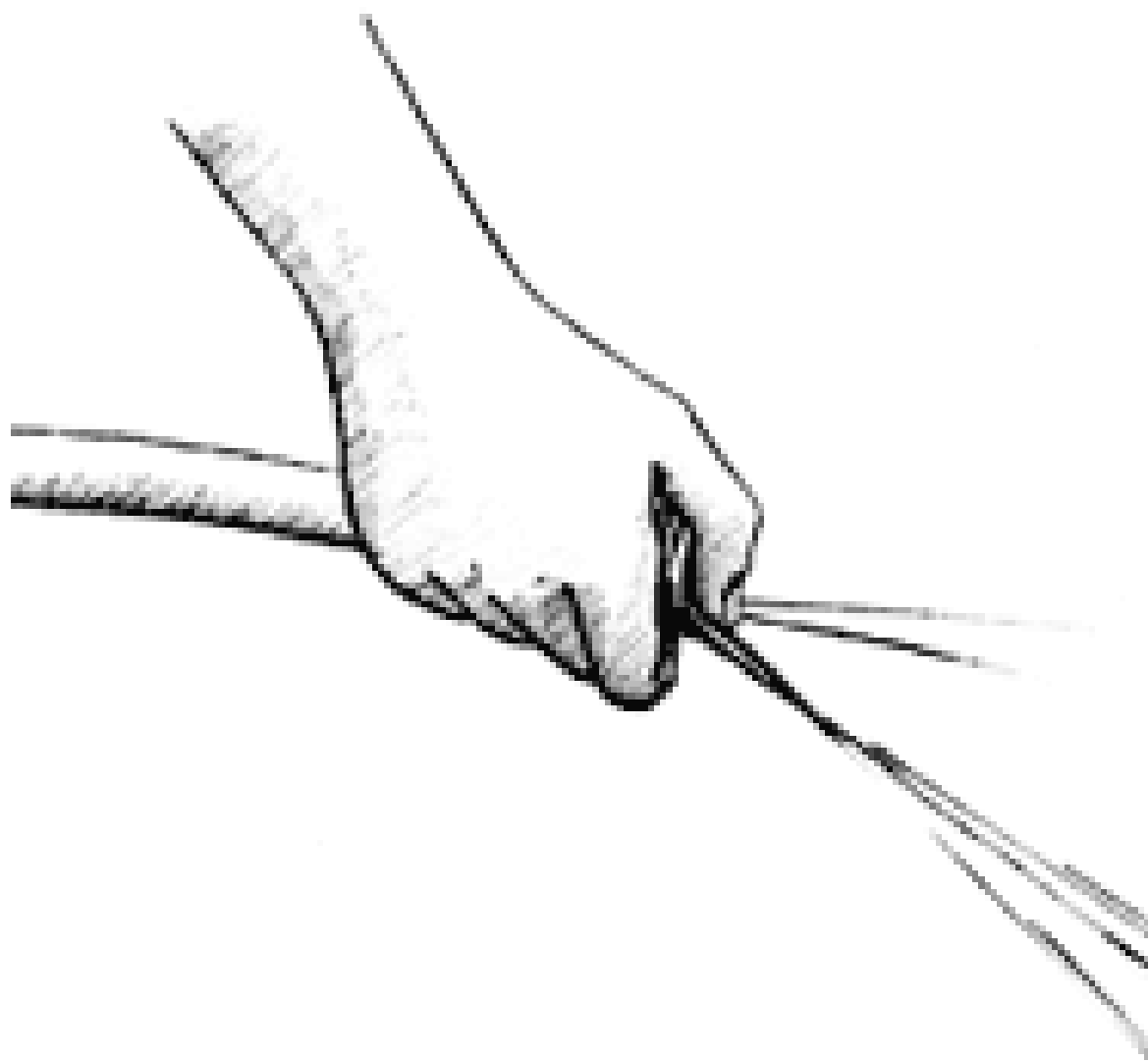
Toe-only rocker sole



Double rocker sole

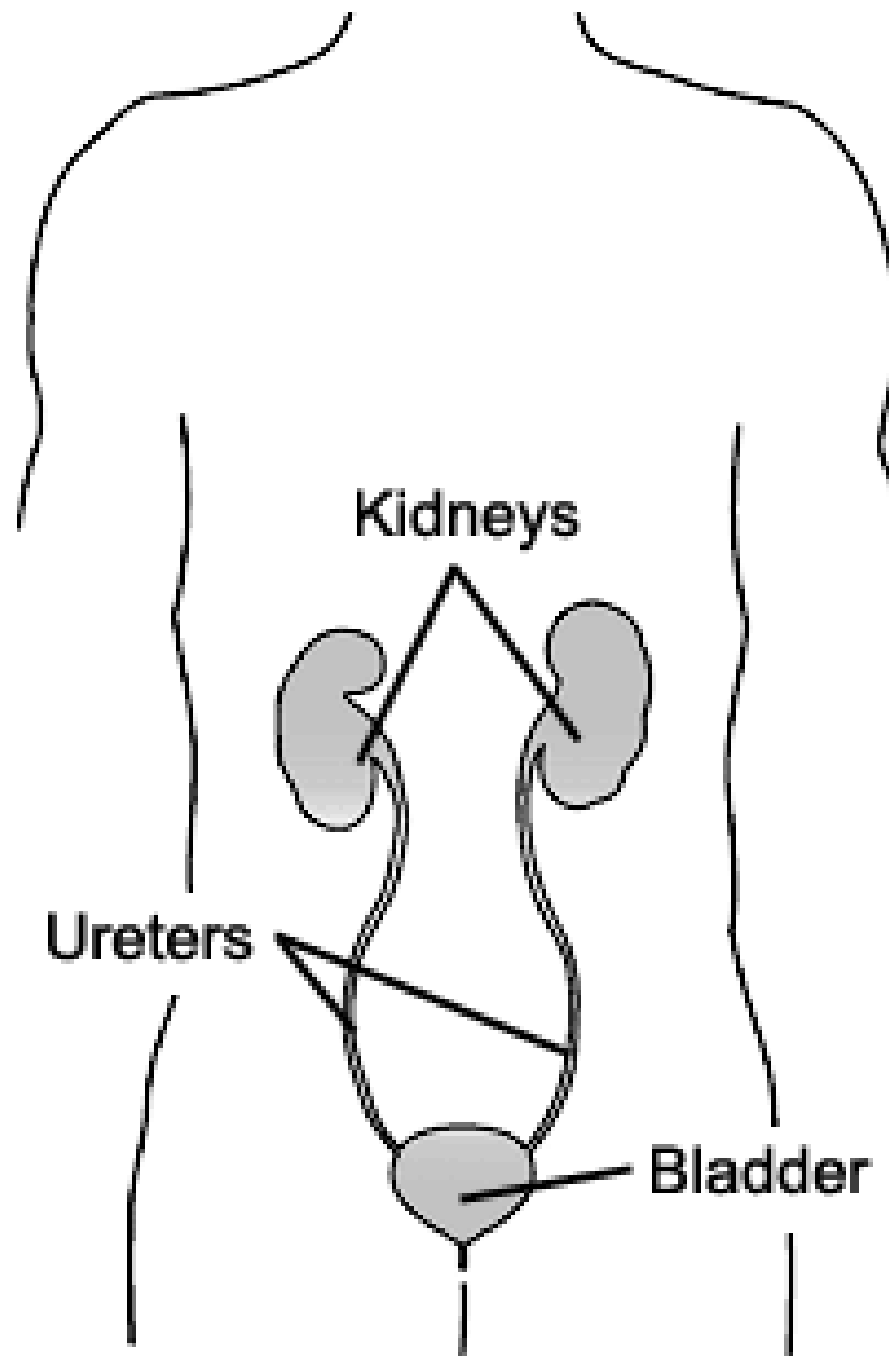


Severe angle rocker sole



Magnitude of the problem

- 20 % of all diabetic patients get diabetic kidney disease (DIABETIC NEPHROPATHY)
- 25 % of all patients undergoing dialysis & Kidney transplant are diabetic patients



Symptoms of Diabetes

Excessive thirst



Prevention of diabetic kidney disease

- **Target group approach:**
 - a) Hypertensive diabetic patients
 - b) DM with f/h/o DM-Nephropathy
- Glycemic control
- Aggressive HTN control
- Quit smoking
- Dietary protein-restriction

Complications of Diabetes

Nervous System Problems - Neuropathy

- It affects 65% of people with diabetes.
- Poor blood glucose control is at the root of neuropathy.
- Symptoms may include:
 - A loss of bowel or bladder control.
 - Problems with digestion.
 - Muscle weakness.
 - Sex problems.
 - Pain
 - feeling in the hands or feet, or a loss of pain sensation in the extremities, which may contribute to such problems as foot ulcers.

Symptoms of Diabetes

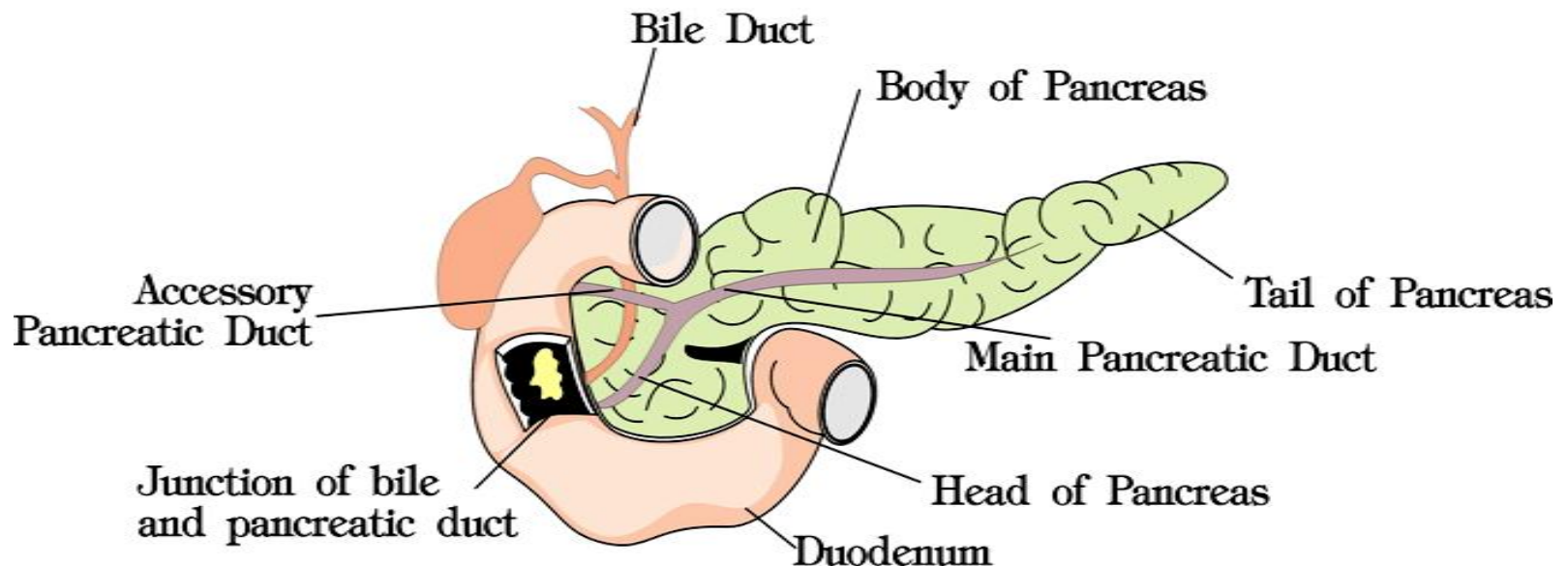
Excessive hunger



Foot complications in Diabetic patients

- 50% I-limb amputations other than trauma are a consequence of diabetes
- ↑ Risk of amputations – 15 times high
- 50% of diabetes related hospital admissions are for foot disease
- 50%, contra lateral limb amputation in 4 yrs

DIABETES IS A DISEASE WHERE
THE BODY DOES NOT
PRODUCE OR
PROPERLY USE INSULIN.



Artificial sweeteners, permitted in moderate quantity



No Fruit Juice



No soft drinks



Permitted



Symptoms of Diabetes

Excessive thirst



Symptoms of Diabetes

Excessive hunger



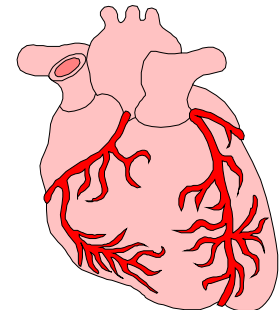
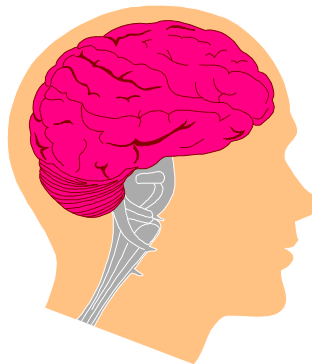
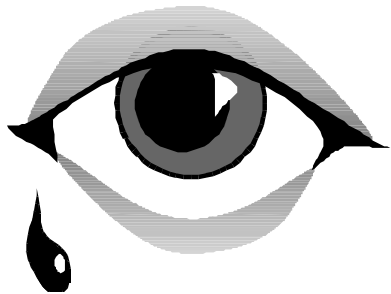
Symptoms of Diabetes

Weight loss



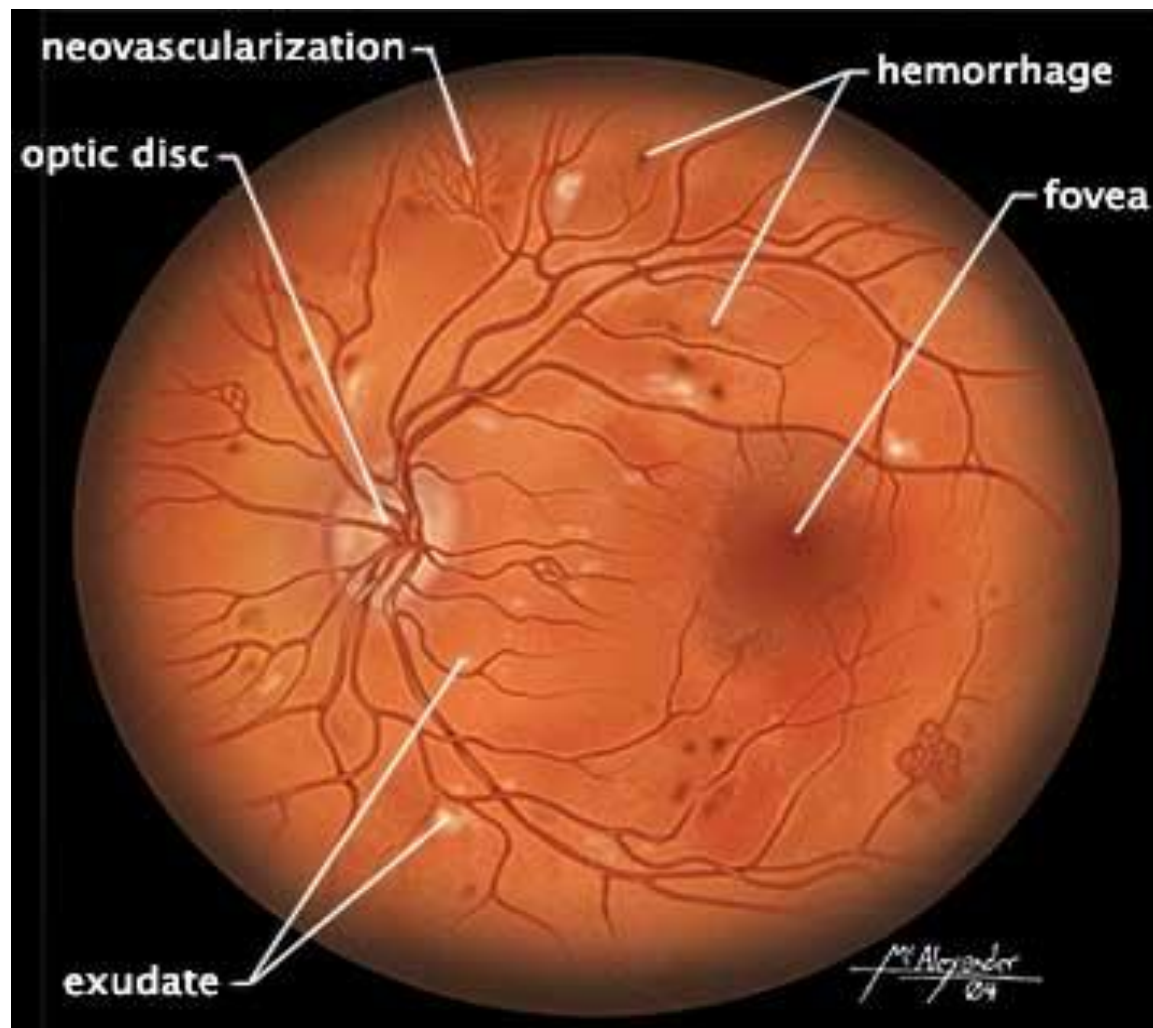
Why to control Diabetes ?

- If not controlled Diabetes can lead to serious complications of eyes, kidneys, heart, nervous system.
- Therefore, diabetes needs to be controlled strictly.



Type 2 Diabetes : Impact of Cardiovascular disease

- **Framingham Study: (Mortality in DM patients)**
 - 80 % due to Cardiovascular disease
 - 75% : CAD
 - 25% : Stroke
- 2-4 fold increased risk



Foot complications in Diabetic patients

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Diabetic neuropathy

Diagnostic tools

Biothesiometry

Tip Therm



MONO FILAMENT





Hammer toe

Intrinsic - Minus Foot



Sign of Motor Neuropathy







No sweets / sugar / Honey

- r



DIABETES & Blood pressure control

Tight blood pressure control (BP < 140/80 mm of Hg)

Reduces the risk of
Any diabetes related end points : 24%

Diabetes related deaths:
32%

Stroke : 44%

Microvascular end points
:37%

Diabetic neuropathy

Diagnostic tools

Biothesiometry

Tip Therm



MONO FILAMENT



Symptoms of Diabetes

Weight loss





**Oedema
of Legs**



5-15-2018
15-7-2018

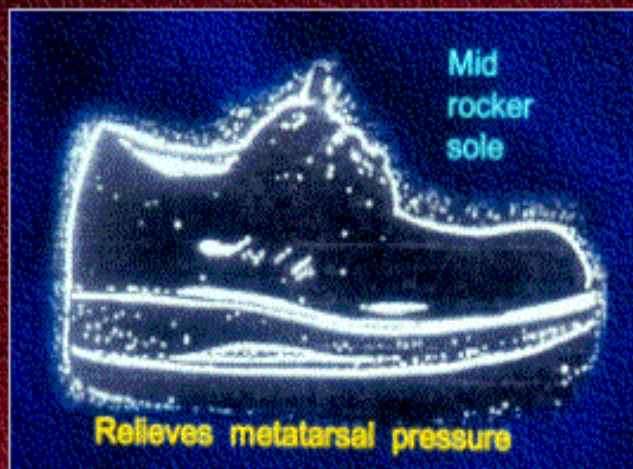
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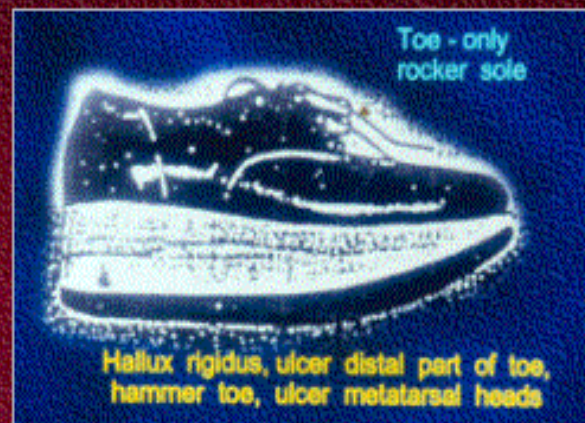
Role of Surgery

Skin grafting





Mid-rocker sole



Toe-only rocker sole



Double rocker sole



Severe angle rocker sole

- The best way to prevent neuropathy is to practice tight blood glucose control.





Trapezium

DIABETES & Blood pressure control

Tight blood pressure control (BP < 140/80 mm of Hg)

Reduces the risk of
Any diabetes related end points : 24%

Diabetes related deaths:
32%

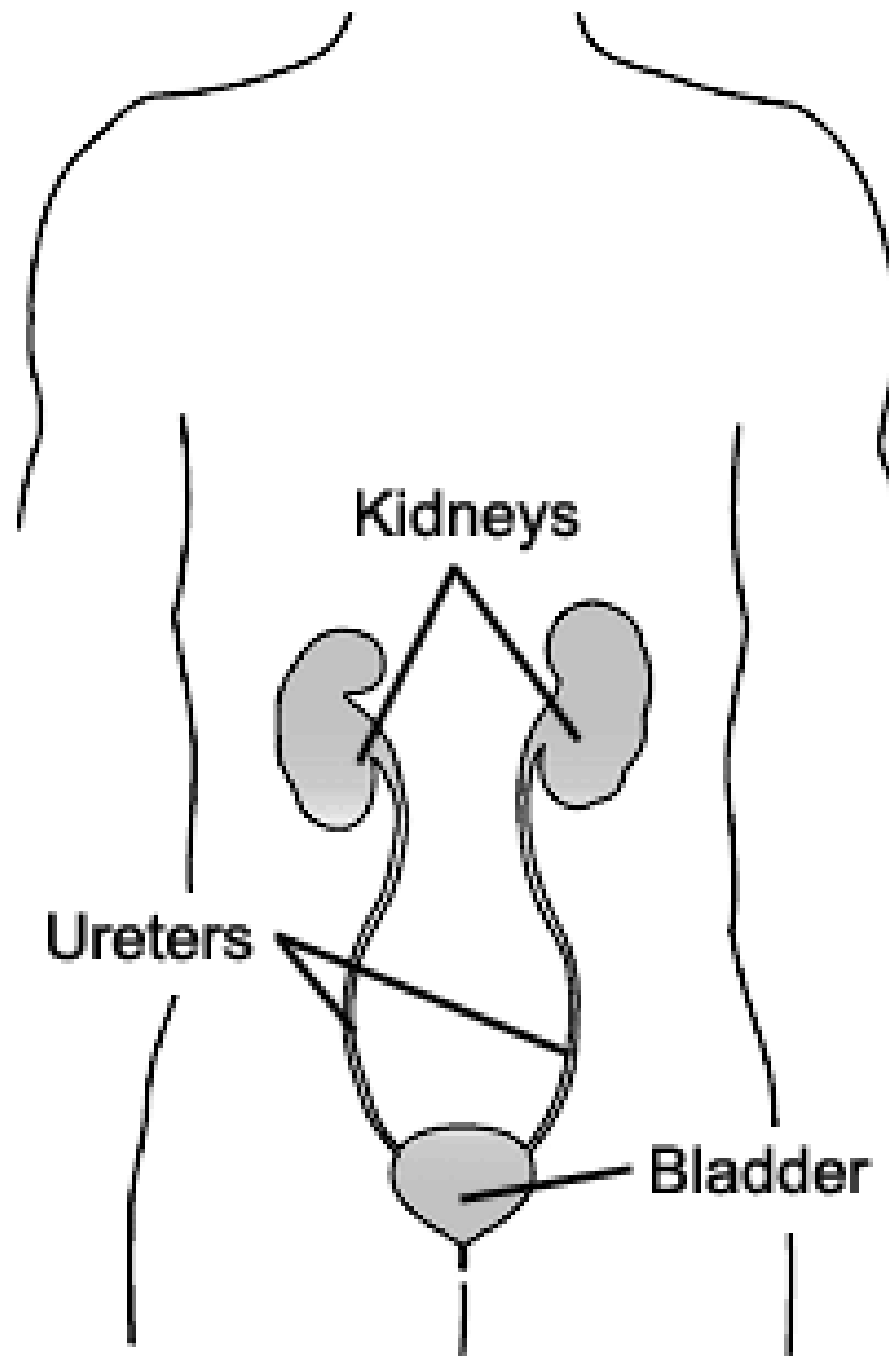
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:37%



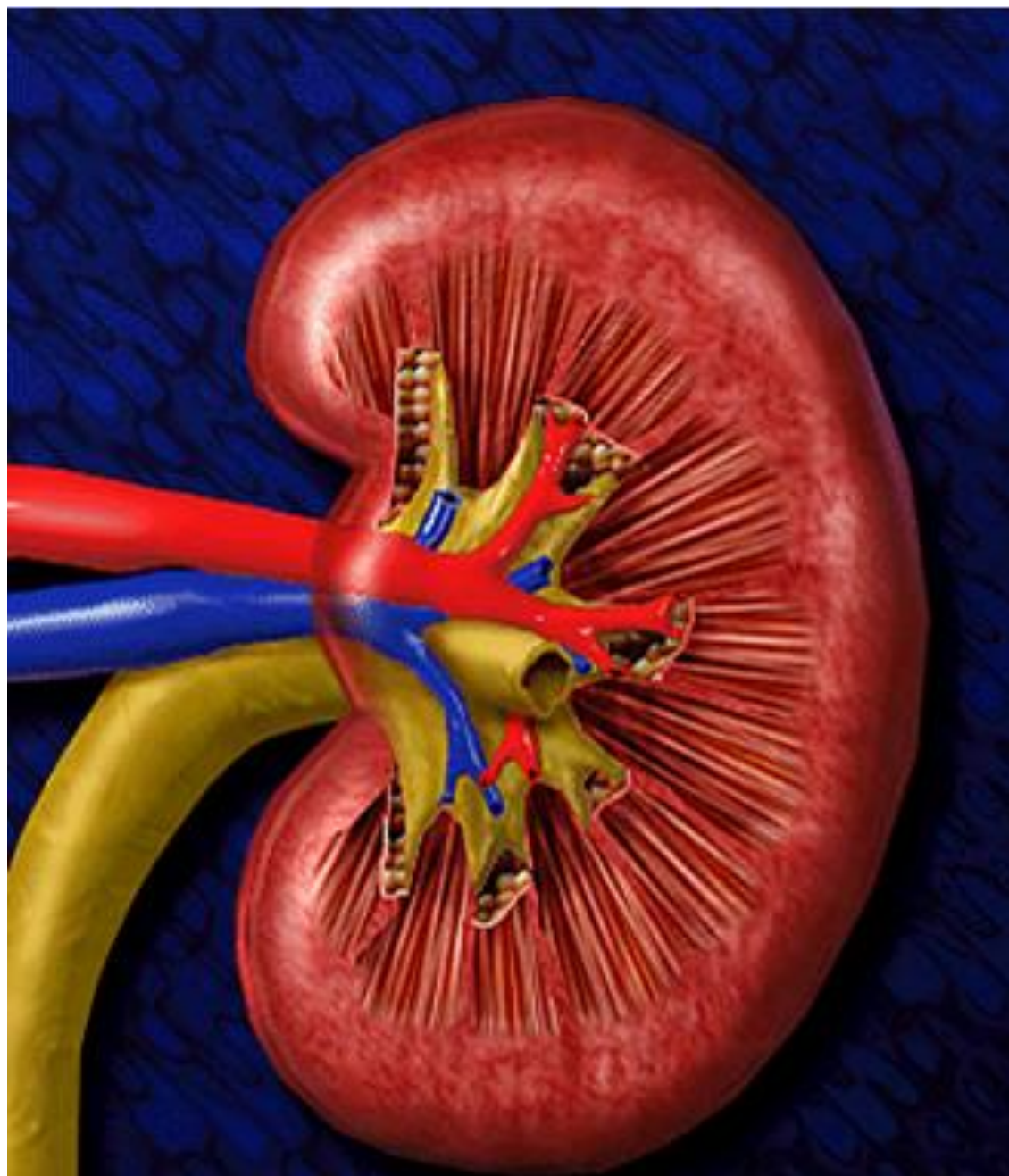
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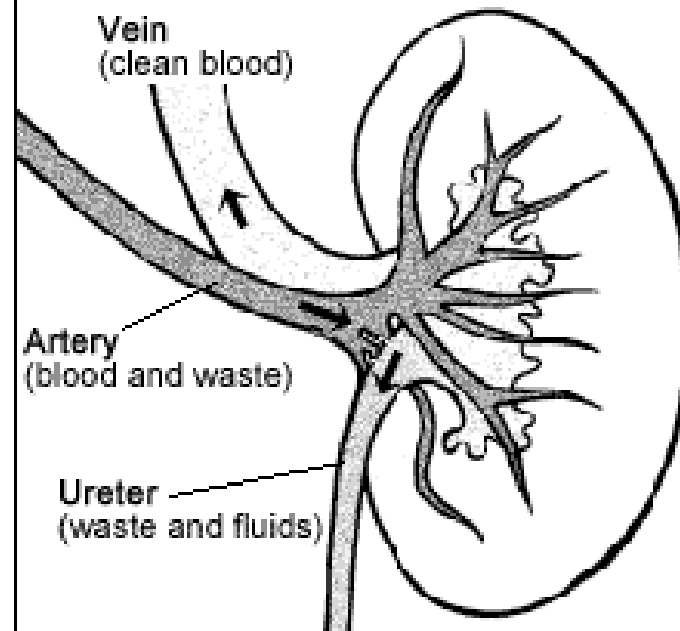


Prevention of diabetic kidney disease

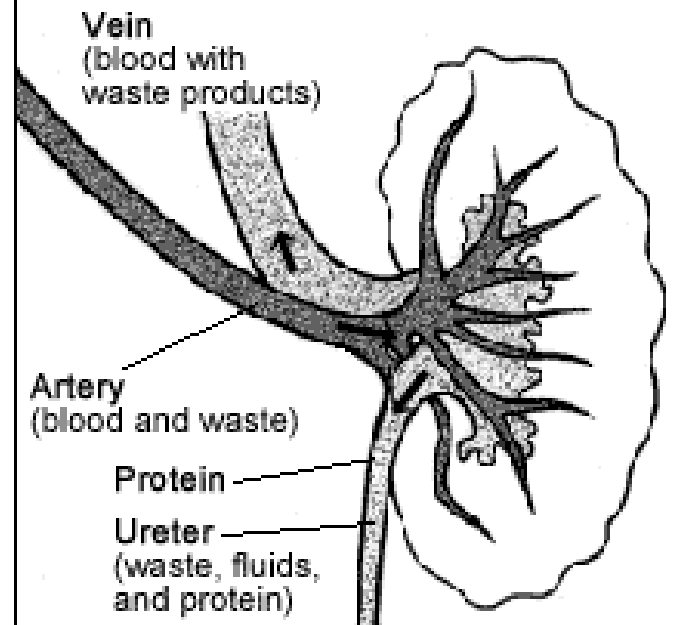
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Healthy kidney

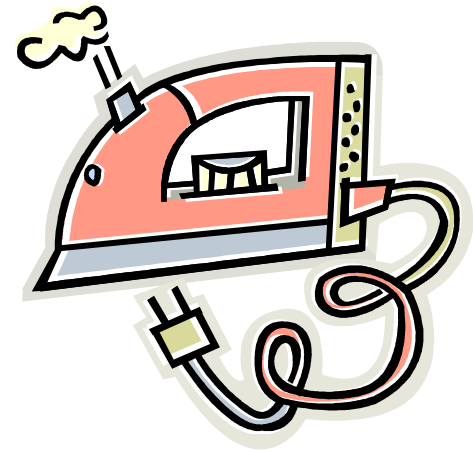


Unhealthy kidney



Diabetes Future

- No insulin injections
- Liberal diet
- Computerized wrist watch to monitor blood sugar
- Blood sugar without drawing blood
- Vaccines to prevent certain types of diabetes
- Artificial pancreas



Prevention of Type 2 Diabetes

Target group

- **Obesity**
- **Intrauterine exposure to diabetes**
- **Low birth weight → Over fed afterwards**
- **Sedentary life**
- **Family History**
- **Urban life**

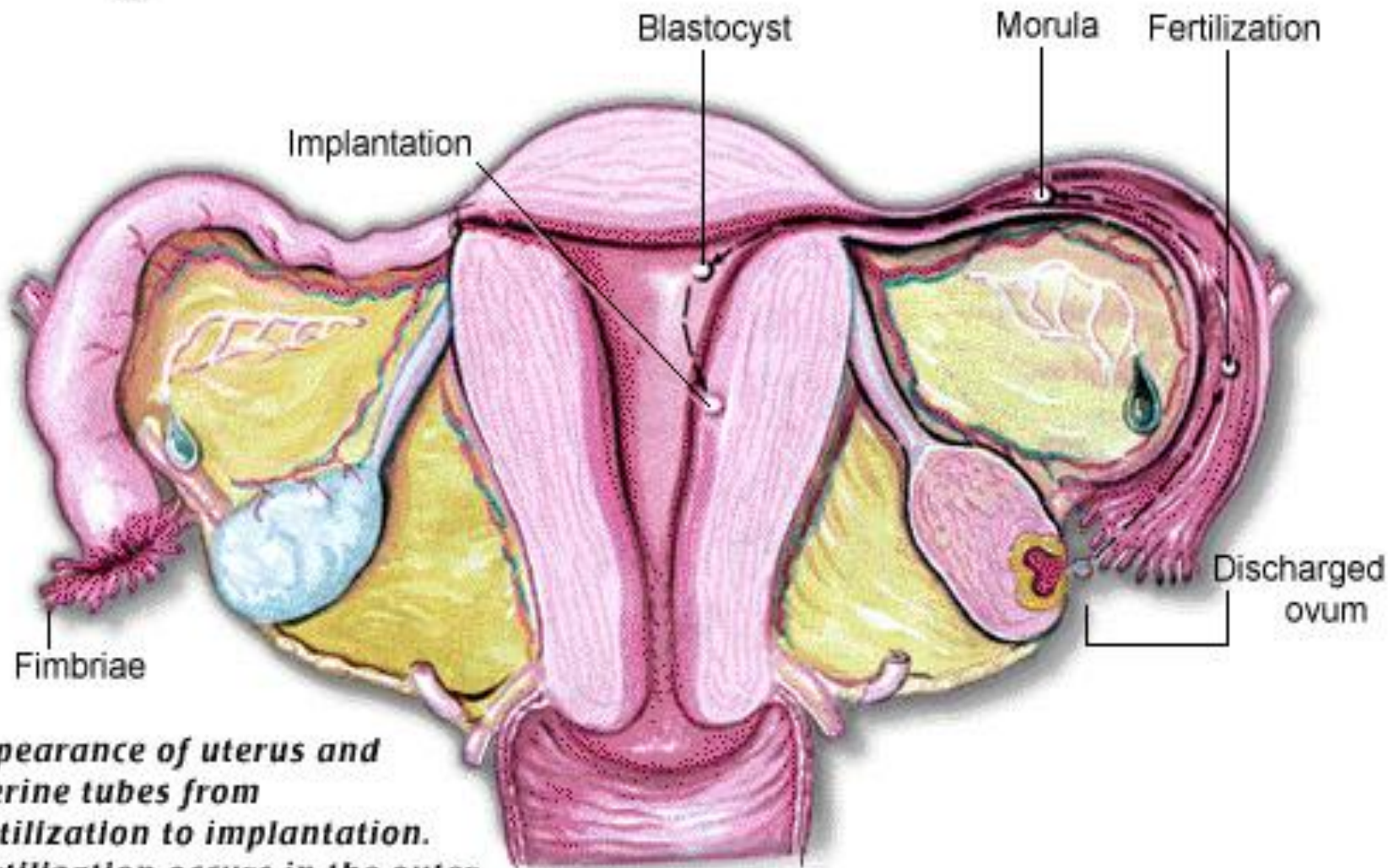
Prevention of Type 2 Diabetes

Prevention measures

- Life style modification: 5-10 % wt reduction, ½ hour walk – 5 days/week→ Prevents diabetes by 55 %
- Pharmacological measures: 21- 33% prevention
- Getting healthy new born, preventing childhood obesity, avoiding marriages in near relatives
- Natural food, Eat less, Walk more

Reproductive

Uterus and Uterine Tubes



Appearance of uterus and uterine tubes from fertilization to implantation. Fertilization occurs in the outer third of the uterine tube. Development reaches the blastocyst stage after the embryo has entered the uterus.

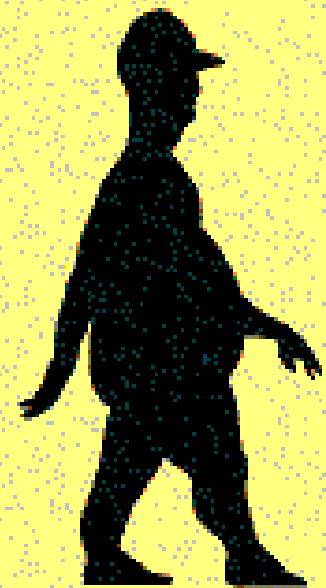
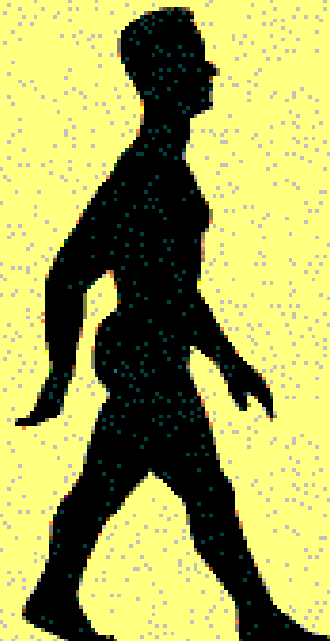
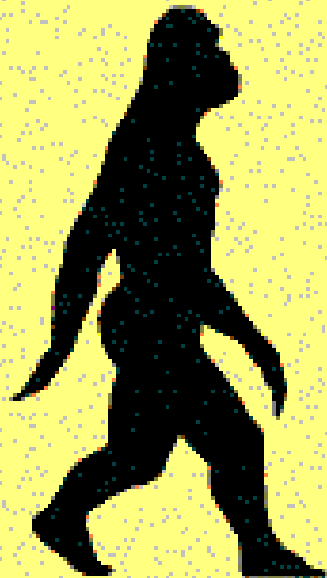
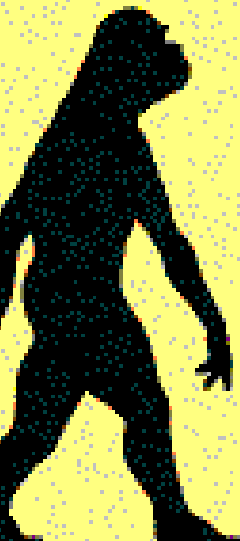
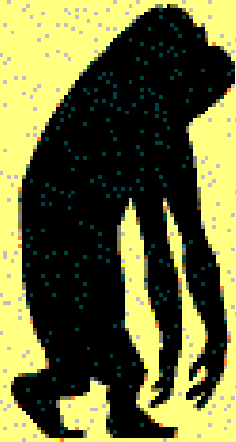
Problems with existing Insulins

- Unpredictable action profile
- No physiological mimicking of endogenous insulin
- Hypoglycemia is THE issue
- No flexible Life style – Dependence on diet
- Inability to aggressive titration to treat target

Designer insulins

- Insulin Glargine,
- Insulin Lispro
- Insulin Aspart,
- Inhaled insulins
- Insulin aerosols
- Implantable insulin pumps







Behavior Modification

- Eat slowly -- this way you are less likely to be tempted to overeat.
- Do not snack between meal
- Try using a smaller plate



Eat better, eat less, eat in time
Fight obesity, Prevent Diabetes



Medicines: Insulin

Preparing the injection (one t

- Wash your hands and mix the insulin



- Remove the flat, colored cap from the bottle; do not remove the rubber stopper or the metal band under the cap



Medicines: Insulin

Preparing the injection (one type of insulin)

- Insert the needle through the rubber stopper of the bottle, making sure that the tip of the needle is not in the insulin.
- Depress the plunger to push air into the bottle.



Medicines: Insulin

Preparing the injection (one type of insulin)

- Turn the bottle and syringe upside down, so that needle is in the insulin.
- Pull back on the plunger of the syringe. This will draw insulin into the syringe.
- Stop pulling when the plunger reaches the line for your prescribed dose.



Medicines: Insulin

Preparing the injection (one type of insulin)

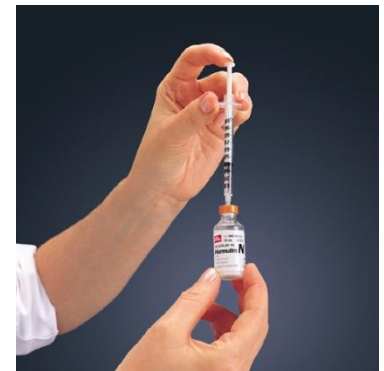
- If bubbles are present, push the insulin back into the vial and start again with the previous steps. Repeat the process until there are no bubbles.
- Pull the needle out of the rubber stopper. If you need to lay the syringe down, put the cover back on the needle.



Medicines: Insulin

Preparing the injection (two types of insulin)

- Mix the insulin, remove the flat plastic cover and clean the stopper.
- Inject air into the vial of NPH in the number of N units prescribed by your doctor. Do not draw insulin into the syringe. Remove the syringe from the vial.



Medicines: Insulin

Preparing the injection (two types of insulin)

- **Inject air into the vial of R in the number of R units prescribed by your doctor. Then turn the vial and the syringe upside down. Pull back on the plunger until you have drawn your prescribed dose of R into the syringe.**
- **Remove any air bubbles, then remove the needle from the vial of R.**



Medicines: Insulin

Preparing the injection (two types of insulin)

- **Insert the needle into the vial of NPH. Then turn the vial and the syringe upside down. Pull back on the plunger until the syringe contains your prescribed total dose of R and NPH. Be careful not to push any R into the vial of NPH.**



Medicines: Insulin

How to take the injection

- Choose an injection site
- “Pinch” up a large area of skin
- Insert the needle into the skin at a 90° angle
- Push the plunger all the way down. Release the pinched skin and count to five slowly.
- Pull the needle straight out
- Do not rub the injection site.



Medicines: Insulin

Preparing the injection (two types of insulin)

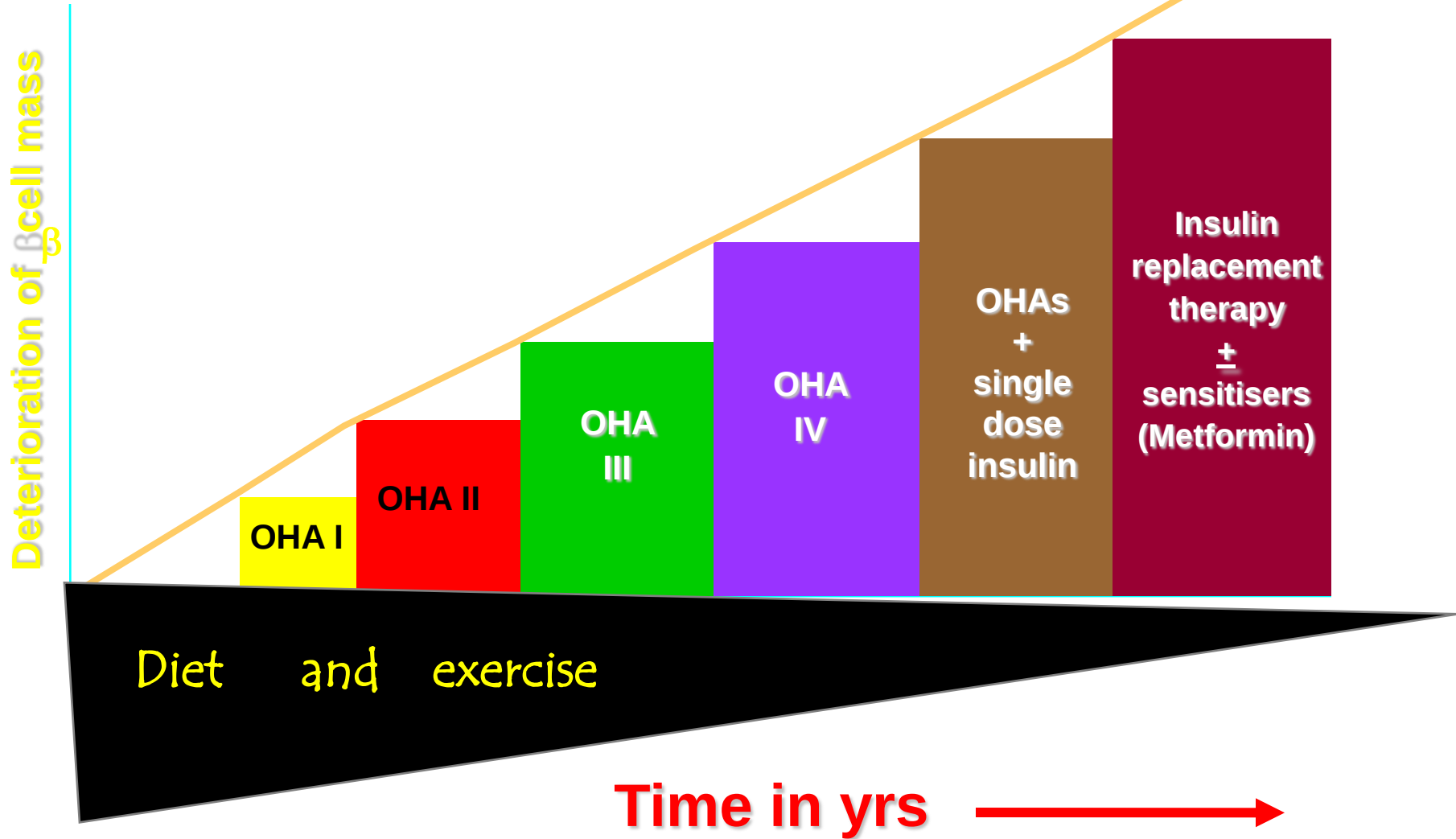
- **R should be drawn into the syringe first. This prevents cloudiness in the R vial due to inadvertent contamination that may occur if the NPH is already in the syringe.**
- **Caution: Do not push the extra insulin (more than the dose) that you draw from the from the NPH vial back into the vial. This will cause insulin in the vial to be contaminated. Discard the insulin in the syringe and start over again**







Natural history of Type 2 Diabetes



Preventive measures

- Diabetes prevention programme
- **Finish Study – NEJM May, 2001**: 522 Obese pts ($\text{BMI} > 31\text{kg/m}^2$) with IGT: Life style modification (diet & exercise): Incidence of diabetes after 4 yrs: 11% vs 23% (58% reduction) in intervention vs control group
- **Intervention for IGT pts**: Pharmacological / Nonpharmacological

Pregnancy and diabetes

- Pregnant ladies more prone for diabetes

Body Mass Index (BMI)

- **BMI** = Weight (kg)
[Height (m²)]

e.g. wt 80 kg,

Height 160 cm

BMI: WHO guidelines

- Obesity 30-34 (Class I)
- Severe Obesity 35 - 39 (Class II)
- Extreme Obesity ≥ 40 (Class III)



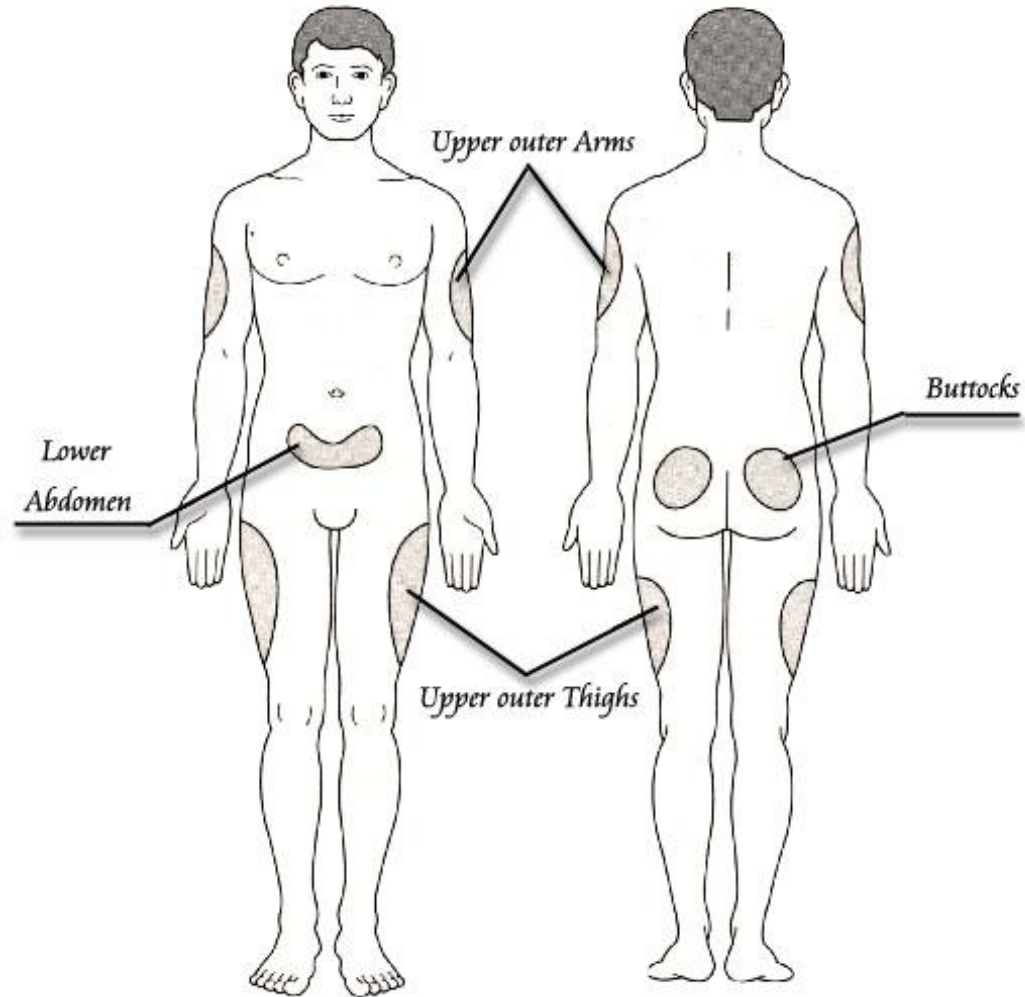
BMI: WHO guidelines

- **Underweight** **< 18**
-
- **Normal** **18 - 24**
-
- **Overweight** **25 - 29**
-

Medicines: Insulin

Injection sites:

- Injections are taken at sites where there is enough fat
- Rotate the sites of injection every day



Type 2 Diabetes : Impact of Cardiovascular disease

- **Framingham Study: (Mortality in DM patients)**
 - 80 % due to Cardiovascular disease
 - 75% : CAD
 - 25% : Stroke
- 2-4 fold increased risk