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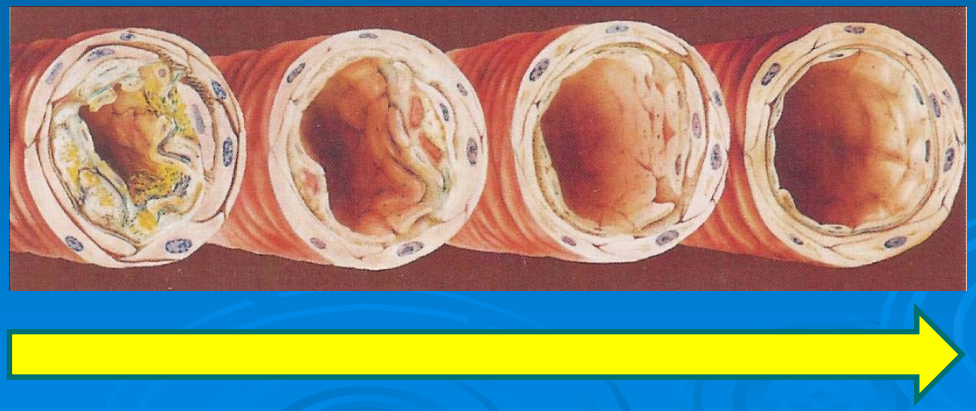
Intravenous Phosphatidylcholine Application for the Treatment of Atherosclerosis



Phosphatidylcholine (PC)

- 1. What is Phosphatidylcholine ?
- 2. Effects of Phosphatidylcholine
- 3. Practical Application

Phosphatidylcholine (PC)

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Phosphatidylcholine (PC)

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Phosphatidylcholine (PC)

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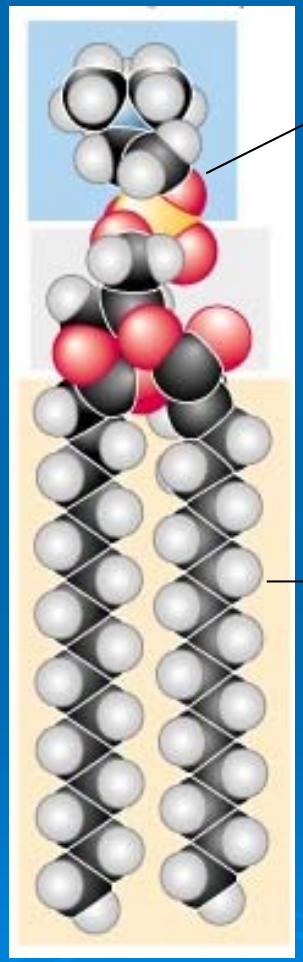
What is Phosphatidylcholine ?

One of 3 essential Phospholipids.

<u>The other two are:</u>
Phosphatidylserine
Phosphatidyethanolamine



<u>Choline head group:</u>
Hydrophilic part

<u>Fatty acid tails:</u>
Eg. Linoleic acid from soy
= both tails unsaturated ➡
1,2 Dilinoleoylphosphatidylcholine, also called Polyenyl PC = **Plaquex®**
or
Palmitic acid from egg yolk
= both tails saturated, eg . Distearoyl PC
or
a combination of both unsaturated and saturated fatty acids eg. Linoleoyl-palmitoyl PC

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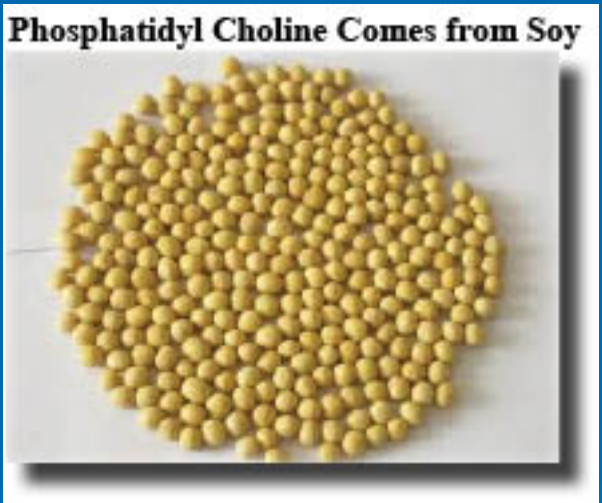
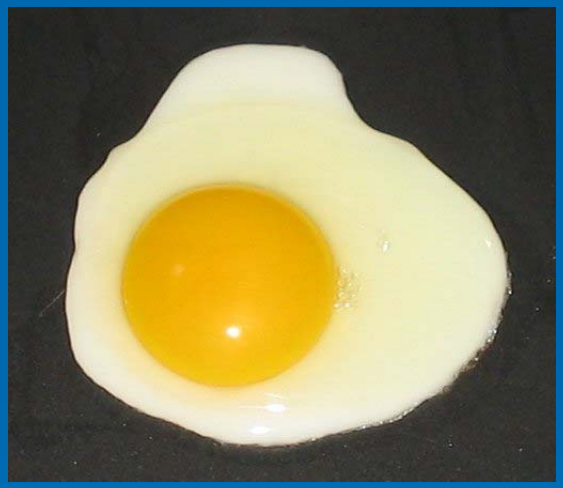
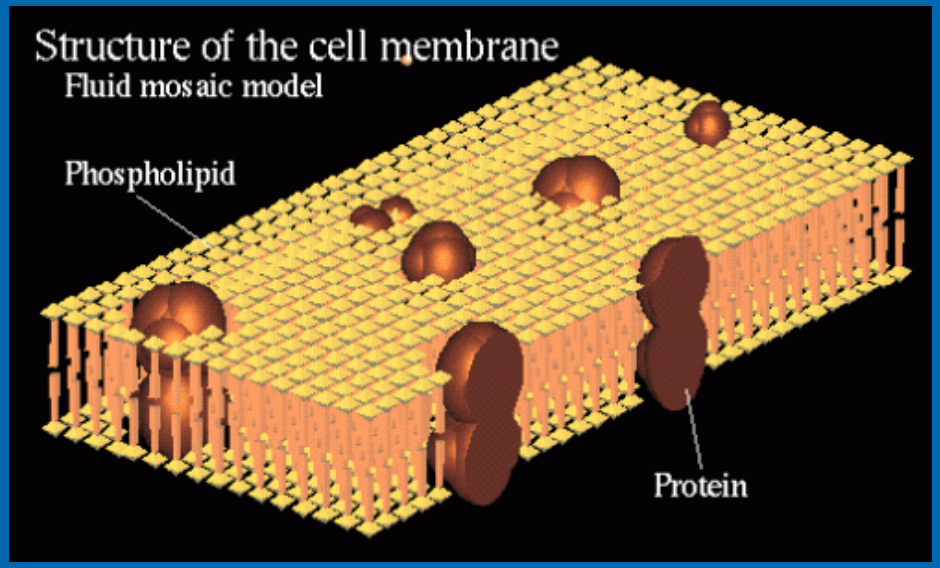
The PC to use is:
1,2 Dilinoleoylphosphatidylcholine from Soy



PC from egg yolk contains saturated fatty acids. Origin of the term Lecithin Lekithos = Greek for egg yolk.



PC builds cell membranes



At birth our cell membranes consist of 90 % Polyenyl-Phosphatidylcholine. As we age we lose more and more until there are only 10 % left in old age.

- Loss of cell membrane fluidity
- Loss of enzyme function within the membranes
- Loss of waste elimination/nutrient uptake through the membranes
- Loss of integrated LDL
- Loss of cell integrity, cell death

Solution: Supplement with 1,2 Dilnoleoylphosphatidylcholine

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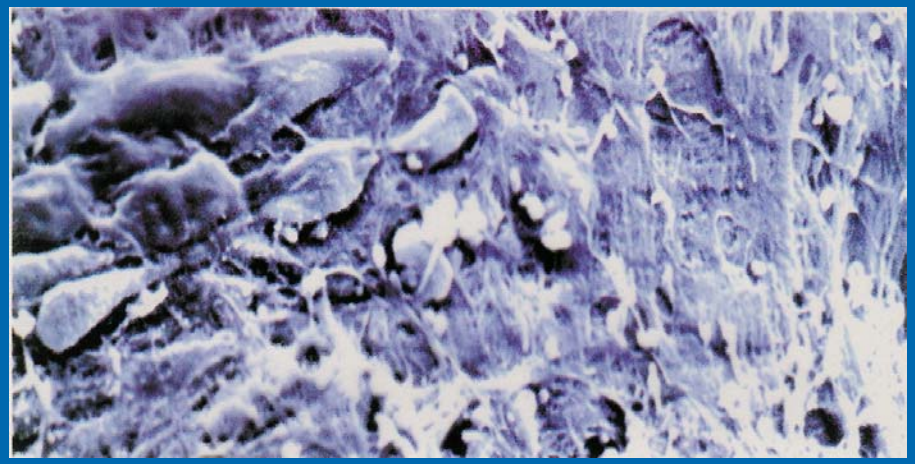
Cell Membrane Damage

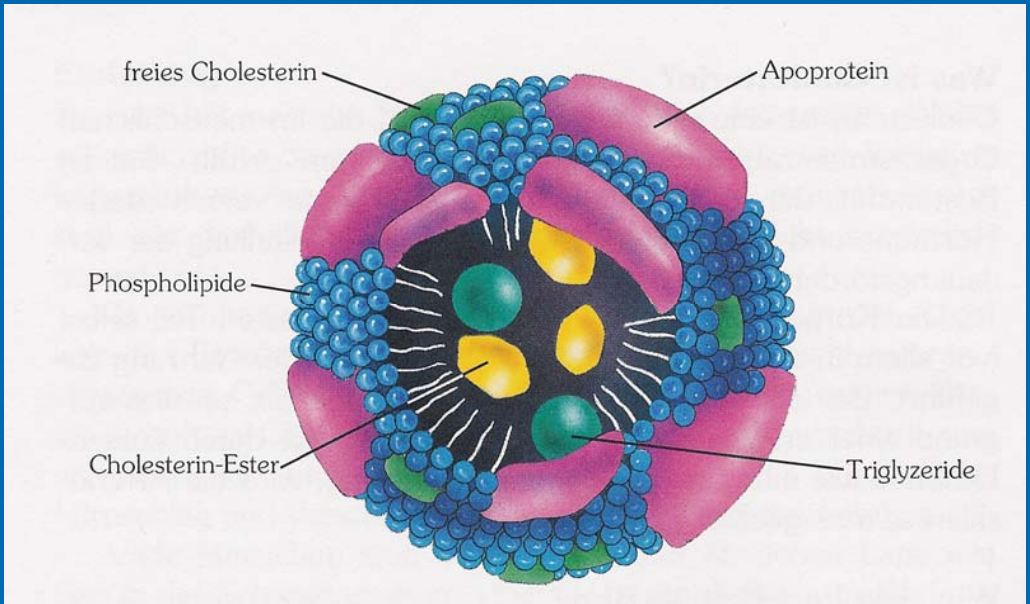


- Free Radicals
- Toxic Substances
- Heavy Metals
- Detergents
- Mechanical (Heart catheter!)

Result of the damage

- Scar tissue
- Formation of Plaque
- Elevated LDL Cholesterol in the Blood
- Cell malfunction
- Reduced Micelle function

...and micelles



Micelles surround cholesterol, TG

2. Effects of Phosphatidylcholine

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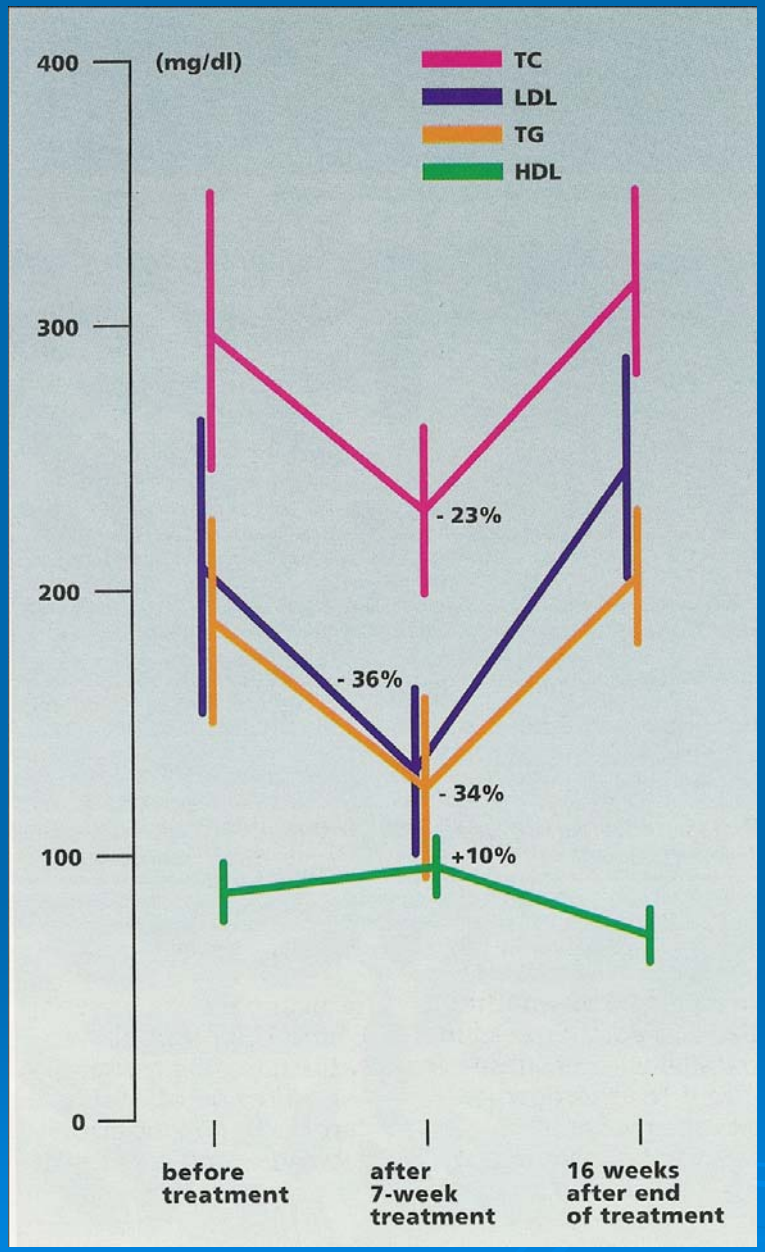
2.1 Effects on total serum cholesterol

3836 patients were assessed in regard to the response of total serum cholesterol and PC.

- In the majority of trials an average reduction of total cholesterol by 12 – 19 % was observed. In some of the trial groups mean values were reduced by more than 20 % against initial values.

- In a documentation of 15 clinical trials with a duration of PC treatment between 1 and 12 months, total cholesterol was lowered 8.8% to 28.2 %. The initial values, route of administration, PC dosage and duration of the treatment determine the percentage of reduction.



Investigation on Rhesus monkeys (1) after a 10-year period of high cholesterol diet and a 7 week period of PC application.

Assessment of serum total cholesterol, LDL, HDL and TG at baseline, 7 weeks after start of PC and 16 weeks after completion of PC.

Total Cholesterol: - 23 %

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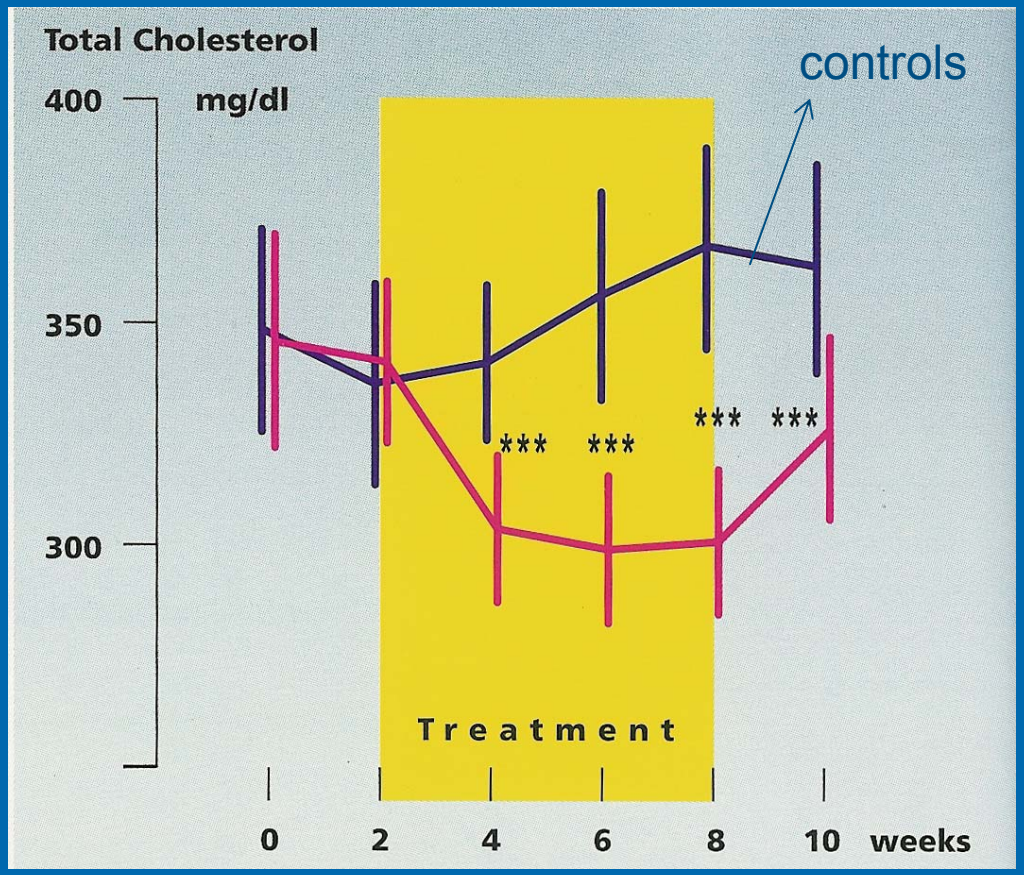

Total cholesterol in serum during a 6-week double-blind treatment with PPC (2.7 g/day orally) and a 2-week follow-up period without medication in patients (n=10; red line) undergoing dialysis for at least 1 year in comparison with controls (n=10;blue line).(2)

Summary: Give a high enough dosage, treat long enough and do maintenance Therapy

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Transient Increase of Serum Cholesterol

Some investigators reported a slight transient elevation of serum cholesterol at the beginning of treatment.

According to the authors, mobilization of cholesterol from vascular walls can be offered as an explanation for this phenomenon in atherosclerotic patients.

Moreover, it is assumed that with increasing age there is a slowing down of cholesterol clearance which may also be responsible for the effects observed.

2.2 Effects on LDL cholesterol in Serum

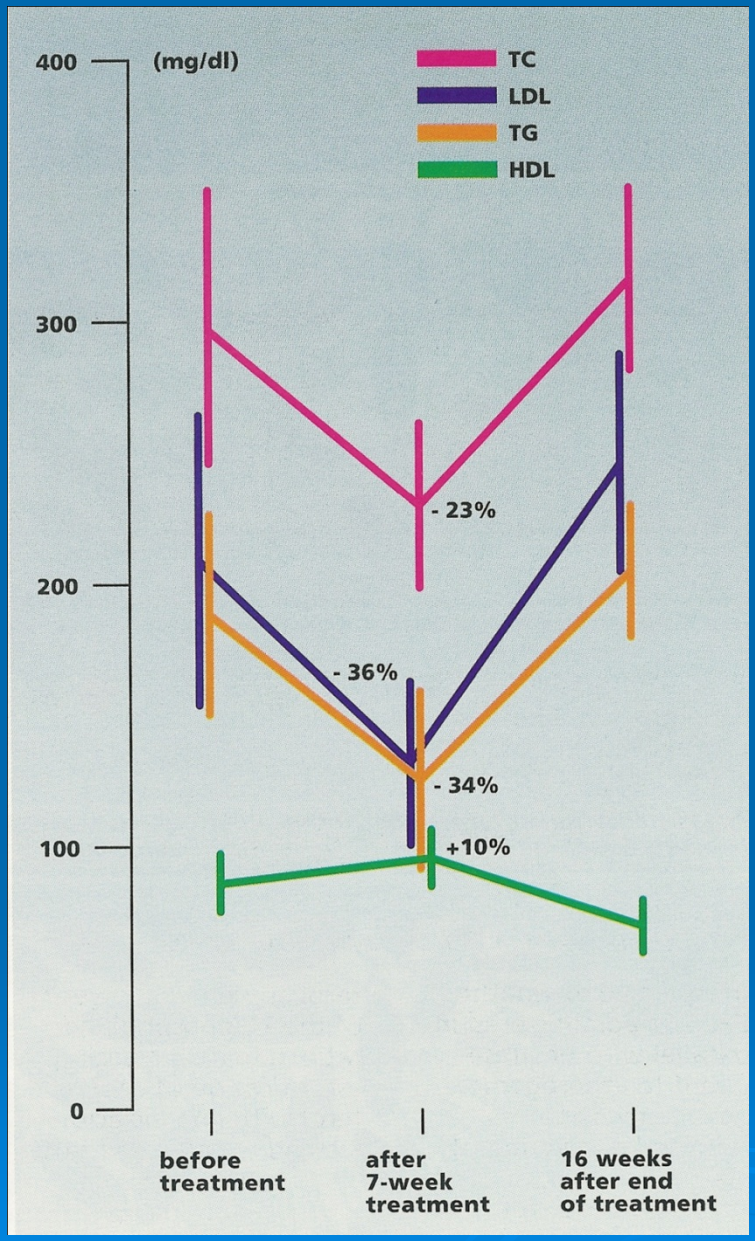
- Reduction of LDL cholesterol in serum has been observed in clinical studies in approx. 1160 patients with the reduction ranging from 10 – 31 % of mean values.

- The extent of the reduction was determined by the type of hyperlipoproteinaemia, the PC dosage and treatment duration.

- In a controled cross-over study mean reduction was 25.8 % of the initial LDL cholesterol levels within 2 months treatment (3).

- Double blind trials against placebo for 14 days did not show distinct changes in the serum profile of lipoproteins.

→ the treatment time most be long enough



LDL – 36 %

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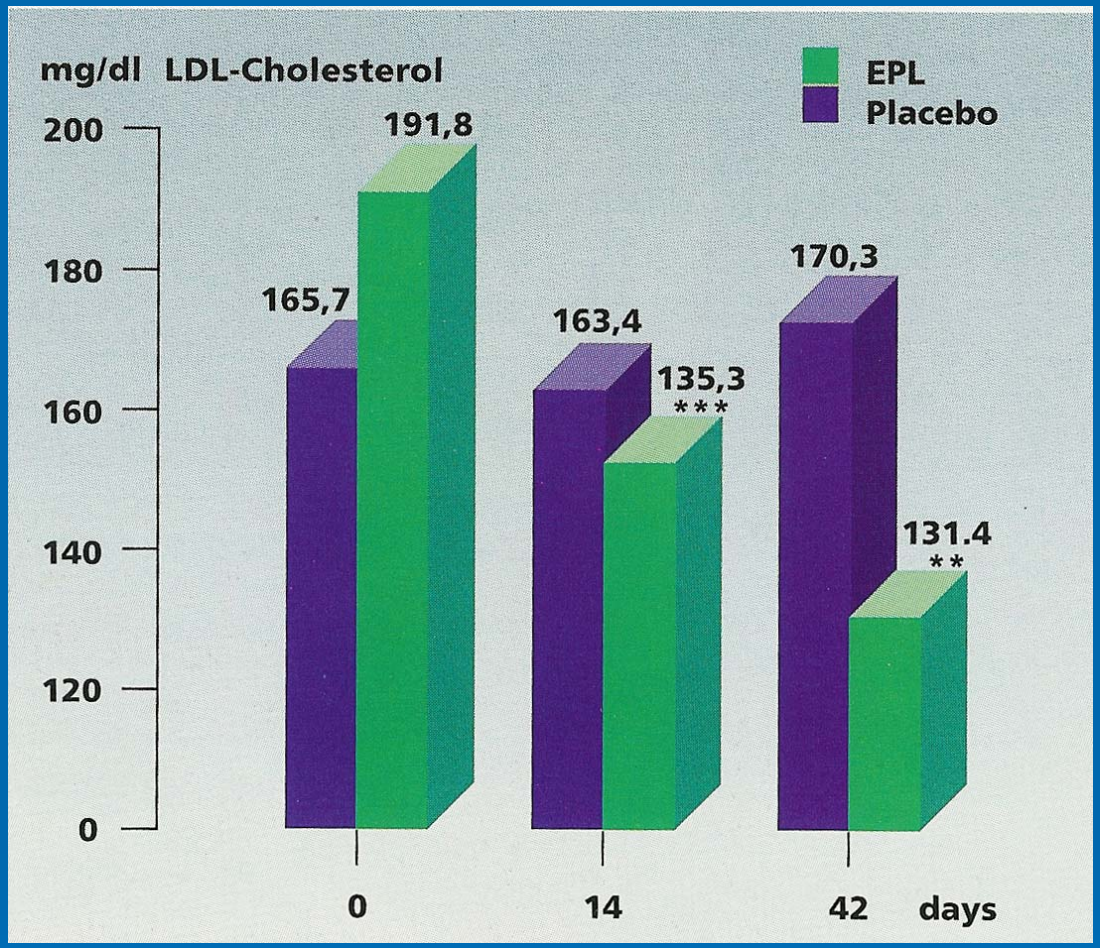

Lowering of serum LDL-cholesterol in patients (n=13) with hypercholesterolaemia type IIb and IV after a 14-day and a 42-day double-blind treatment with 1,8 g PC/d in comparison with controls (n=15).

(4,5)

Summary: Give a high enough dosage, treat long enough and do maintenance Therapy

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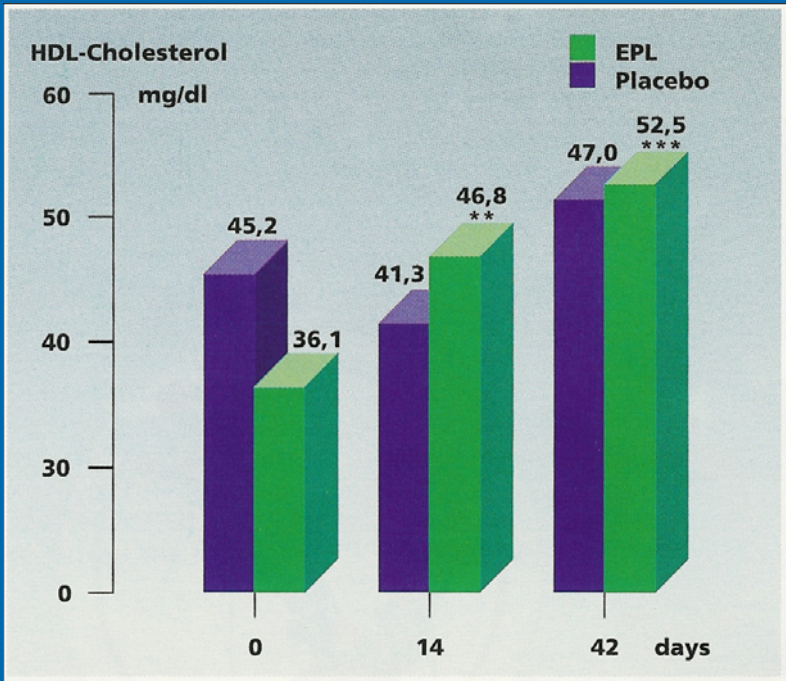
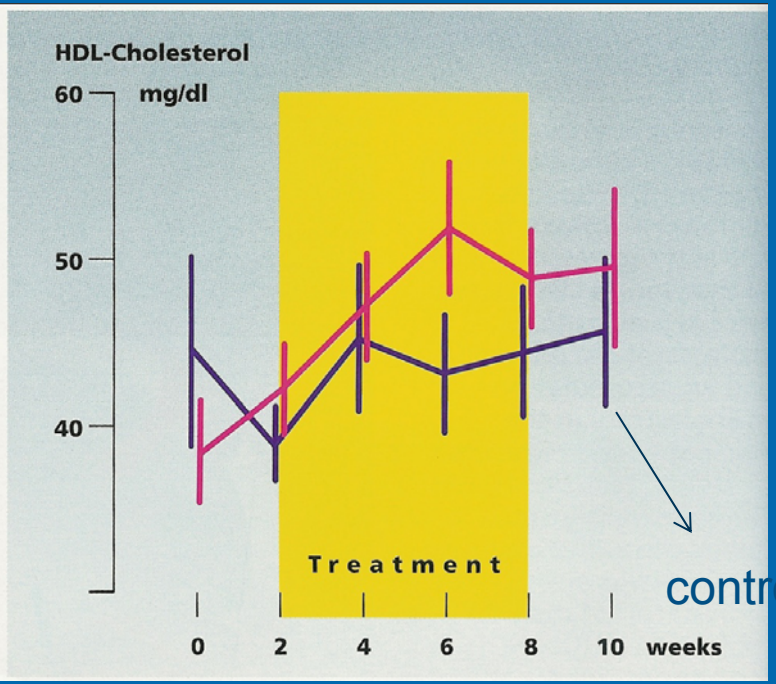
2.3 Effects on HDL Cholesterol in serum

- H. Iszumi observed an increase in HDL cholesterol from 13.4 – 20 % in diabetic patients with 12 months treatment with 1.5 g PC daily (oral). (6)

- Other authors found an increase between 10 and 45 % with various initial values. Very low initial values were raised while high initial values were hardly influenced. (7-19)





Increase of serum HDL cholesterol in patients with hypercholesterolaemia type IIb and IV after 14 and 42 day treatment with 1.8g PC / day

HDL cholesterol in serum during 6 weeks double blind treatment with 2.7g PC/day and 2 week follow up without medication undergoing dialysis for at least 1 year in comparison with controls

Summary: Give a high enough dosage, treat long enough and do maintenance Therapy

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LDL/HDL Ratio

- An open study for 4 weeks with iv PC of 0.5-1 g/d showed decrease from 4.3 to 2.8 in the LDL/HDL ratio. (20)
- A controlled study by S. Uchida showed that the decrease is dose related: most noticeable at doses of 1.5-2.25 g/d showed a 24 % reduction. (21)
- The rise of HDL was more pronounced in non-smokers compared to smokers.

2.4 Effects on Serum Triglycerides

- Elevated TG were treated with PC in a total of 2734 patients.

- The extent of the reduction depends on the length of treatment and the inital TG level. Close to normal levels were lowered only slightly while high levels were lowered significantly. The mean values showed a 25 % drop.

Authors	Reduction in TG in %	Treatment with EPL
KUKES et al. (130)	33.4	oral / 2 months
FAKHRI et al. (106)	34	oral / 2 months
UCHIDA (174)	34–37	oral / 2 months
UNGER et al. (176)	58	i.v. / 3 months
SABA et al. (151)	58	oral / 4 months

Compilation of the various studies done on TG levels and PC treatment

Most effective reduction: intravenous for 3 months

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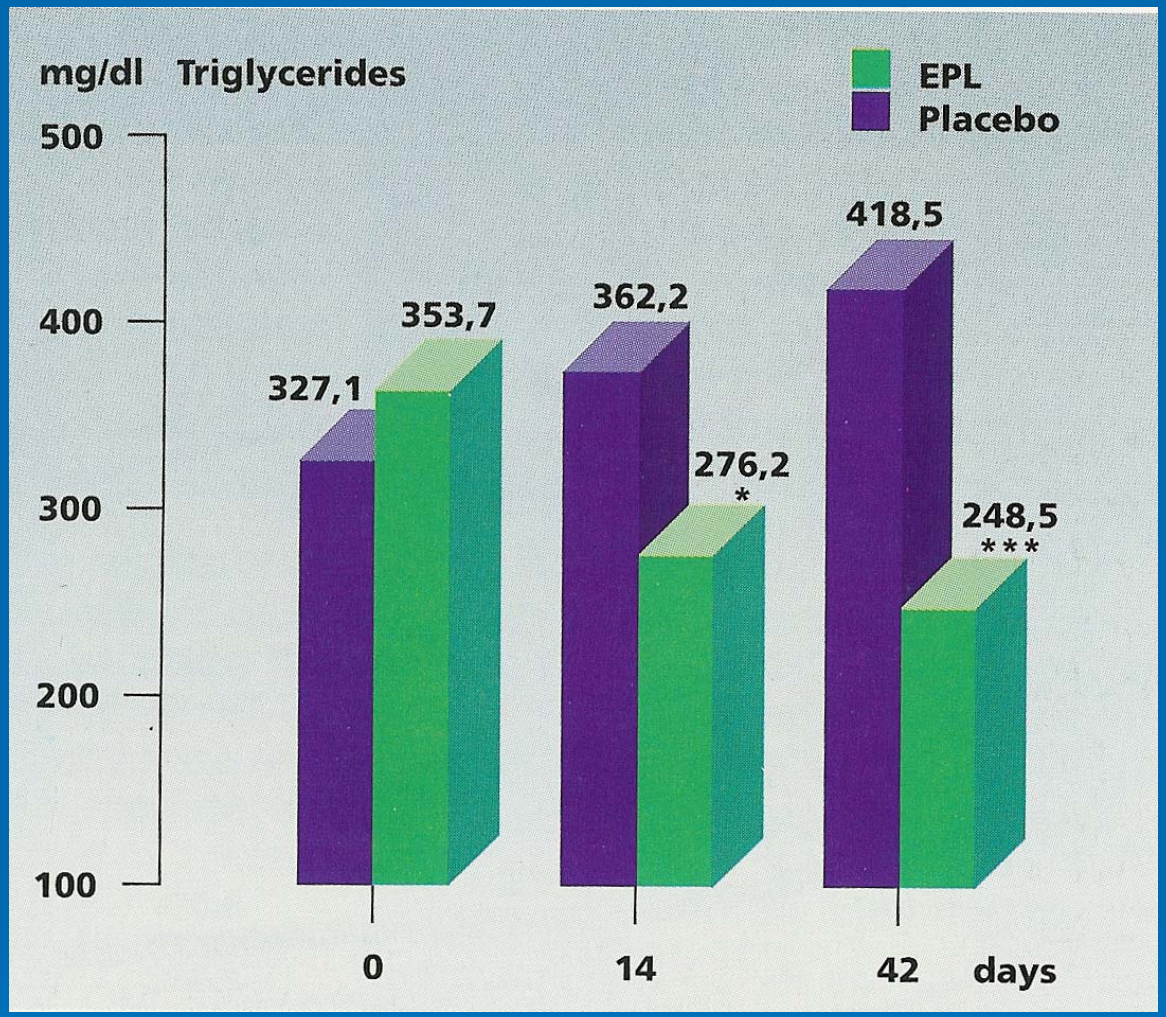

In a double-blind trial (117) with patients on a standardized diet mean values had dropped from 353,6 to 276,2 mg/dl (-21.9%) after only 14 days. (22)

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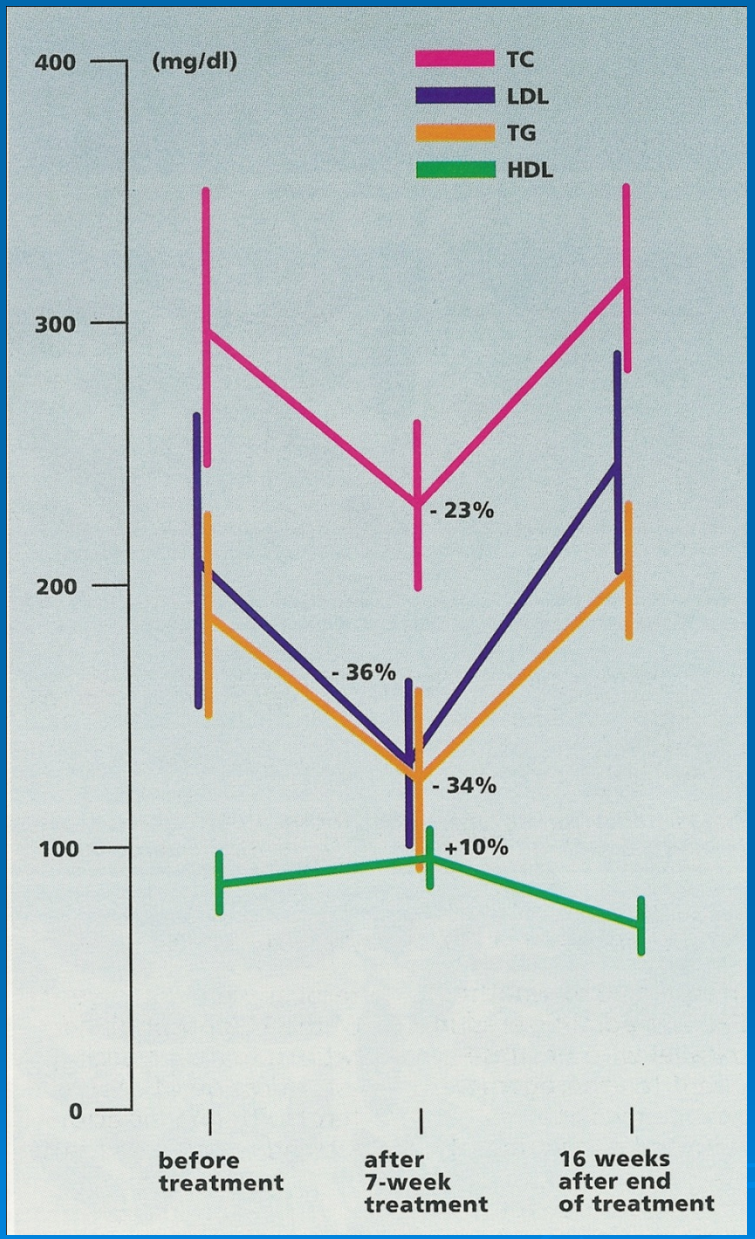

Triglycerides – 34 %

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Influence of nutrition on PC effectiveness

- A 6 week treatment with PC produced mean TG reductions of 22.7% in winter when high caloric intake can be assumed and 58,6 % drop in summer with lower caloric intake. (23)

Winter: TG – 27.7 %

Summer: TG – 58.6 %

➡ Higher caloric intake reduces the effect of PC on triglycerides

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2.5 Influence on Lipid Peroxidation

- Lipid peroxides contribute to the progression of atherogenic lesions in vascular walls.

  A controlled study by V.K. Serkova in a group of patients with angina pectoris was done with 3 week PC treatment 1.8g/d.

  At the end of treatment, there was a reduction in atherogenic serum lipids, rise in HDL and reduction of lipid peroxidation parameters. (15)

- In vitro LDL from humans show increase in lipid peroxidation under oxidative stress. Simultaneous incubation with PC significantly inhibited this increase. (26,70)

- Excessive lipid peroxidation in rats with liver damage induced with tetracycline was suppressed by concurrent or subsequent PC administration. (27,28)

PPC reduces LDL oxidation

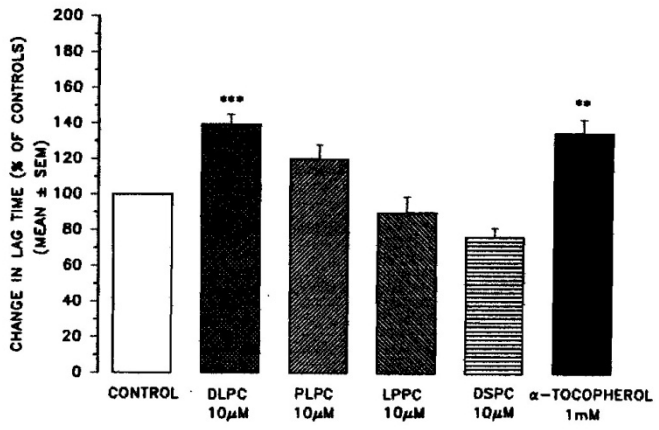

Fig. 1. Effects of various phosphatidylcholines and α-tocopherol on the lag time during copper-mediated LDL oxidation, assessed by the conjugated diene method and expressed as per cent of the corresponding controls. Values are mean ± S.E.M. ($n = 5–15$). α-TOC, α-tocopherol; DLPC, 1,2,dilinoleoyl phosphatidylcholine; DSPC, 1,2,distearoyl phosphatidylcholine; LPPC, 1,linoleoyl-2,palmitoyl phosphatidylcholine; PLPC, 1,palmitoyl-2,linoleoyl phosphatidylcholine. ** $P < 0.01$, significantly different from control; *** $P < 0.001$, significantly different from control.

An in vitro study (70) by Khursheed et al. tested the time it took for LDL to be oxidized.
6 samples including the control were treated with an oxidizing agents (copper sulfate) and different forms of PC.
Dilinoleoyl PC – the one used in PPC formulas- showed a better lag time for LDL to be oxidized than alpha tocopherol. The other PC's such as Palmitoyl-linoleoyl, linoleoyl-palmitoyl or distearoyl PC had much shorter lag times.

Lag time for Dilinoleoyl PC: 140 % compared to control (both chains unsaturated)
Lag time for alpha tocopherol: 135 %
Lag time for Distearoyl PC: 76 % (both chains saturated)
Lag time for Linoleoyl-palmitoyl PC: 90 % (one chain saturated, one unsaturated)

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PPC increases Glutathion levels

- A 10-week application of 100 to 300 mg PC/kg to aging rats not only resulted in a decrease in aortic lipid peroxidation products, but also an increase in glutathione levels in the liver, plasma and aortic tissue. The glutathione dependent antioxidative capacity in the aortic walls was increased significantly.

→ PC produces distinct antioxidative effects.

2.6 Effects on enzyme activity

LCAT

- Lecithin-acyl-transferase is synthesized in the liver. It catalyzes the esterification of free cholesterol so it can be taken up by HDL and eventually eliminated from plasma. (29,30,31)

- The supply of PPC activates LCAT activity while saturated fatty acids diminish its activity. (32, 8, 33, 34, 35, 14, 29-31, 15, 17, 36)

- A.S. Blagosklonov et al. (8), who used PC in 83 cases, considered the observed increase in HDL cholesterol to be related to PC-induced intensification of LCAT activity and an enhanced mobilisation of cholesterol from vascular walls. V.K. Serkova (15) supported this view.

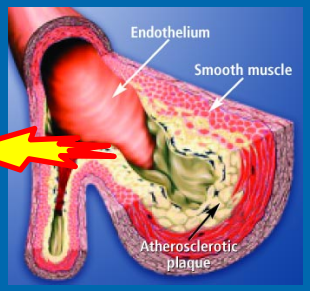
- Summary: PPC activates LCAT which leads to an increase of esterification of cholesterol and in turn an increase in HDL, leading to an increased elimination of cholesterol from vascular walls.

- A controlled study by G. Salvioli with PC infusions for 5 days at a dose of 2 g/d in patients with liver disease found the LCAT activity increased from 31.2 to 65.5 micromol/l/h. (29-31)
- Another trial involving patients with chronic liver disease showed after 2 weeks treatment with1.8 g/d PC an incrase in LCAT activity and improved liver function. (35)

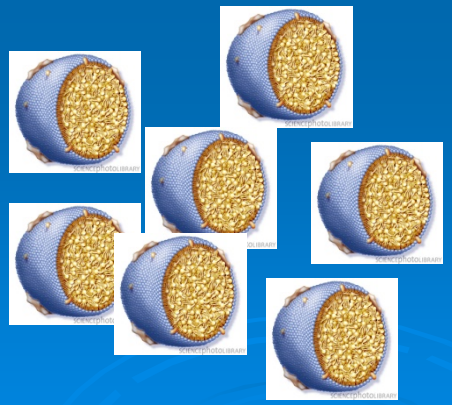
Summary of what LCAT does

LCAT

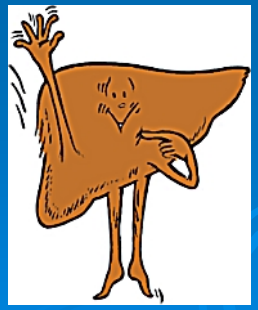
Esterification



HDL with esterified cholesterol



Good bye



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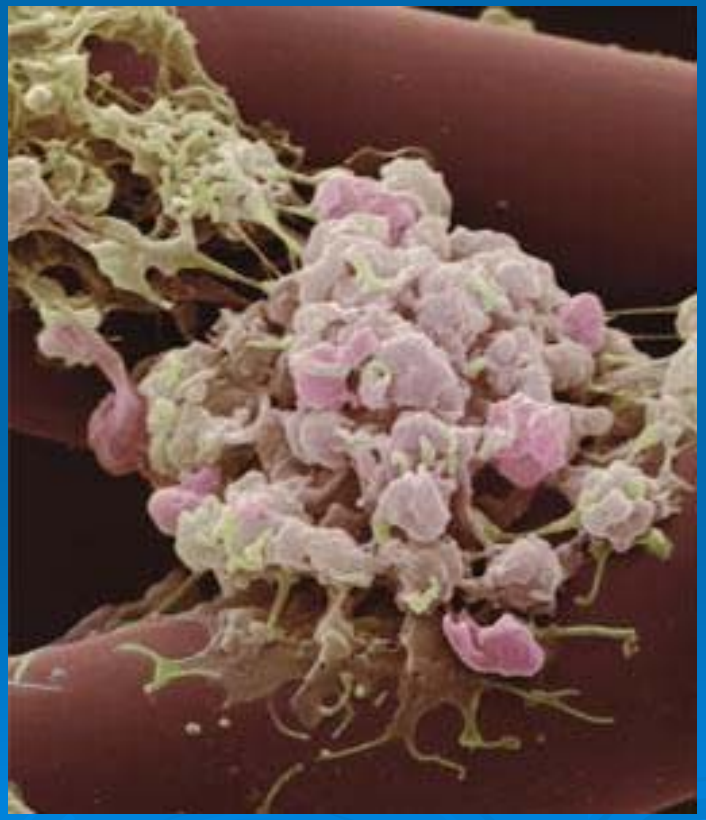
2.7 Influence on Platelets and Red Blood Cells:

a) Influence on Platelet Aggregation

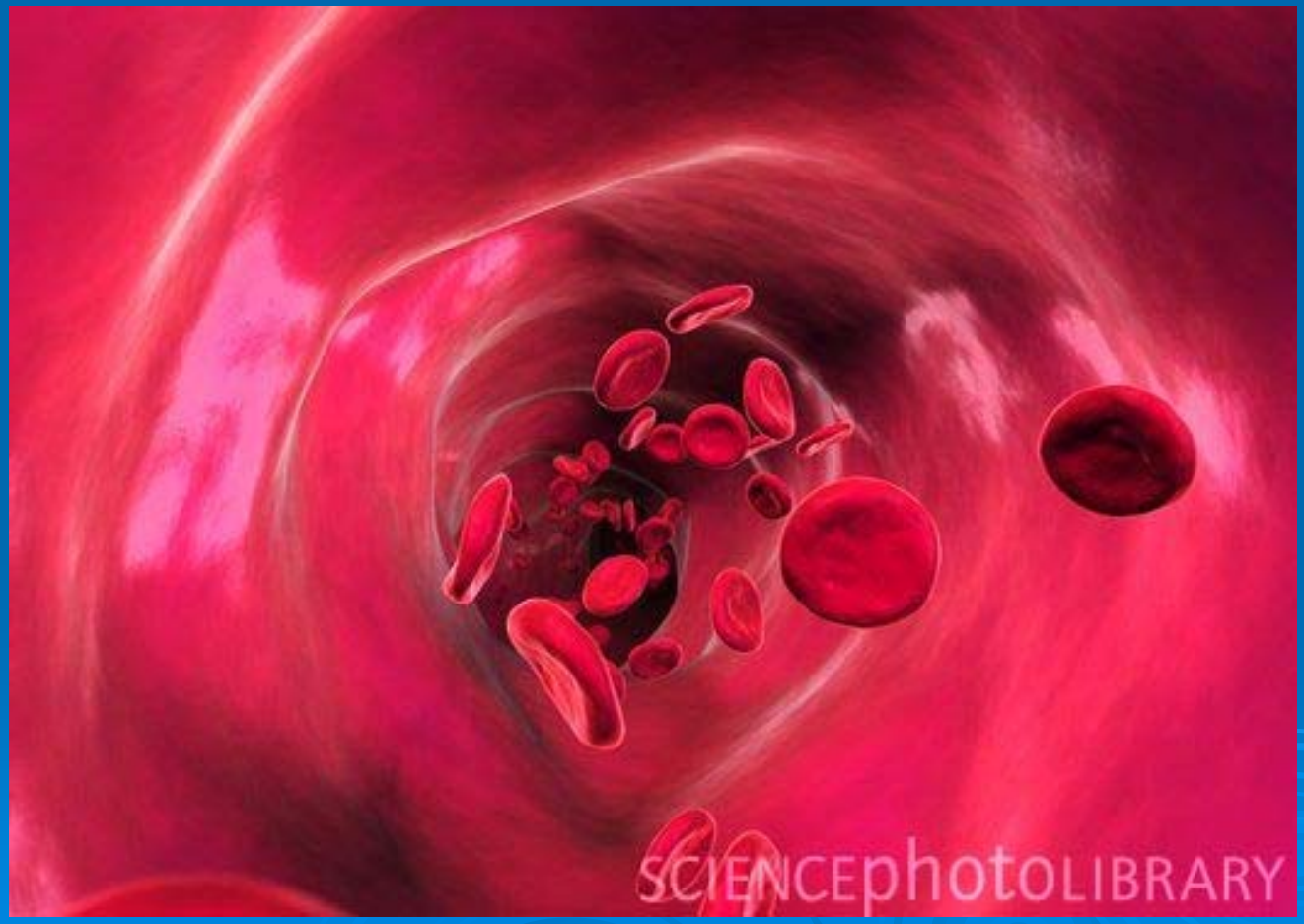


- There is a close relationship between high lipid levels and an increased tendency to adhesion and aggregation of platelets. (40)
  Deposits of platelets on vascular walls enhance the sensitivity of the wall towards substances released from the platelets, increasing the wall permeability, leading to deposits of plasma constituents (eg. Lipids) in the injured wall.
- During 14 days V.A. Almazov et al administered infusions of 500 mg PC/d to 24 patients. The reactive platetelet aggregation was reduced by 60 %. It was explained by the reduced cholesterol content in the platelet membranes and exchange of membrane PC with the infused PC. (41)
- „ Lipid Exchange Therapy“

- R. Merchan and his group arrived at similar results when administering i.v. injections of 250 mg/d of PC over a period of 30 days in cerebral insufficiency of the elderly with increased tendency to coagulation. (43)

- Fifteen and 22 days after the beginning of treatment the intensified spontaneous blood coagulation was found to decrease distinctly, while the thrombo-elastogram showed fibrinolytic acitivity to increase.

b) Influence on red blood cell fluidity



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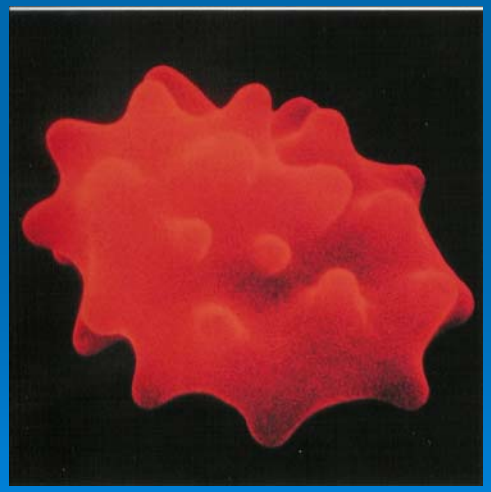
- Structural changes in the RBC membrane resulting in increased accumulation of cholesterol impair the fluidity and functioning of the membrane and RBC deformability.

- A.S. Blagosklonov et al. confirmed an improved passage of red blood cells through microfilters and the normalisation of RBC aggregation in their patient group. Their patients had received i.v. injections of 500 mg of PC and after that had taken 1.8 g of PC/d orally for 3 months. (8)
- The favourable influence on rheological findings and on lipid parameters correlated with an improvement of the clinical picture: depending on the severity of the coronary condition involved, these favourable changes persisted for up to 12 months after withdrawing from PC.

- G. Savioli et al. carried out extensive controlled investigations on the type and incidence of morphological RBC changes in liver disease. According to their report, the cholesterol increase in RBC membranes following a reduction in LCAT activity, provokes expansion and rigidity of the membranes with changes in RBC morphology in the form of uneven contours. (29-31)



2.8 Effects on Atherosclerotic Changes

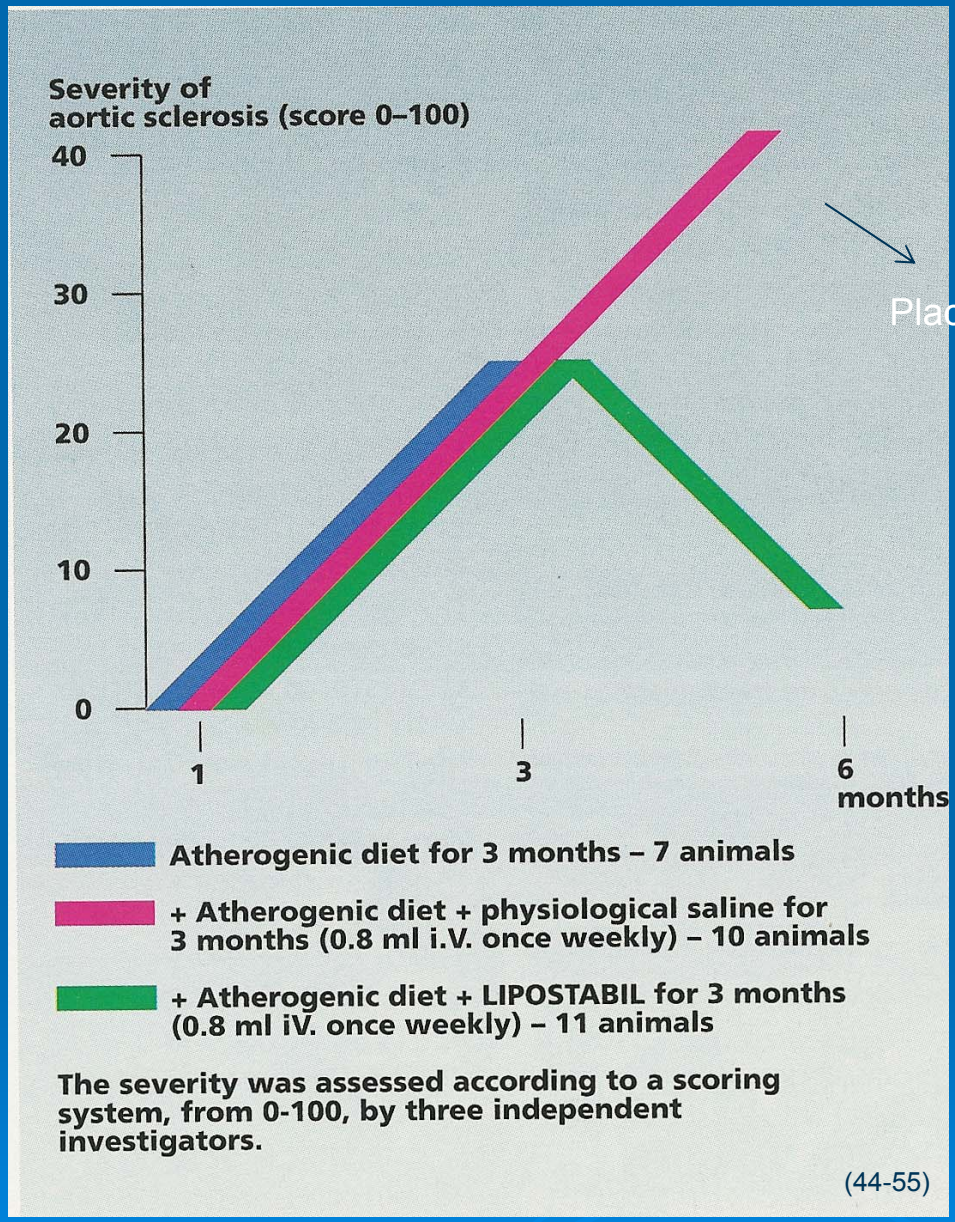
I: The release of cholesterol from cells and tissue was measured following incubation with PC of subendothelial cells from the intima of atherosclerotic human aortas and tissue sections from the aortic intima.

Cellular cholesterol content was lowered in comparison to that of untreated cell cultures by up to 40 %.

II:Atherosclerotic changes simililar to those in humans were induced by diet in different species.

→ concurrent PC treatment prevented formation of atherosclerotic changes

→ PC treatment after discontinuation of the 6 month diet showed marked or complete regression of atherosclerotic changes.



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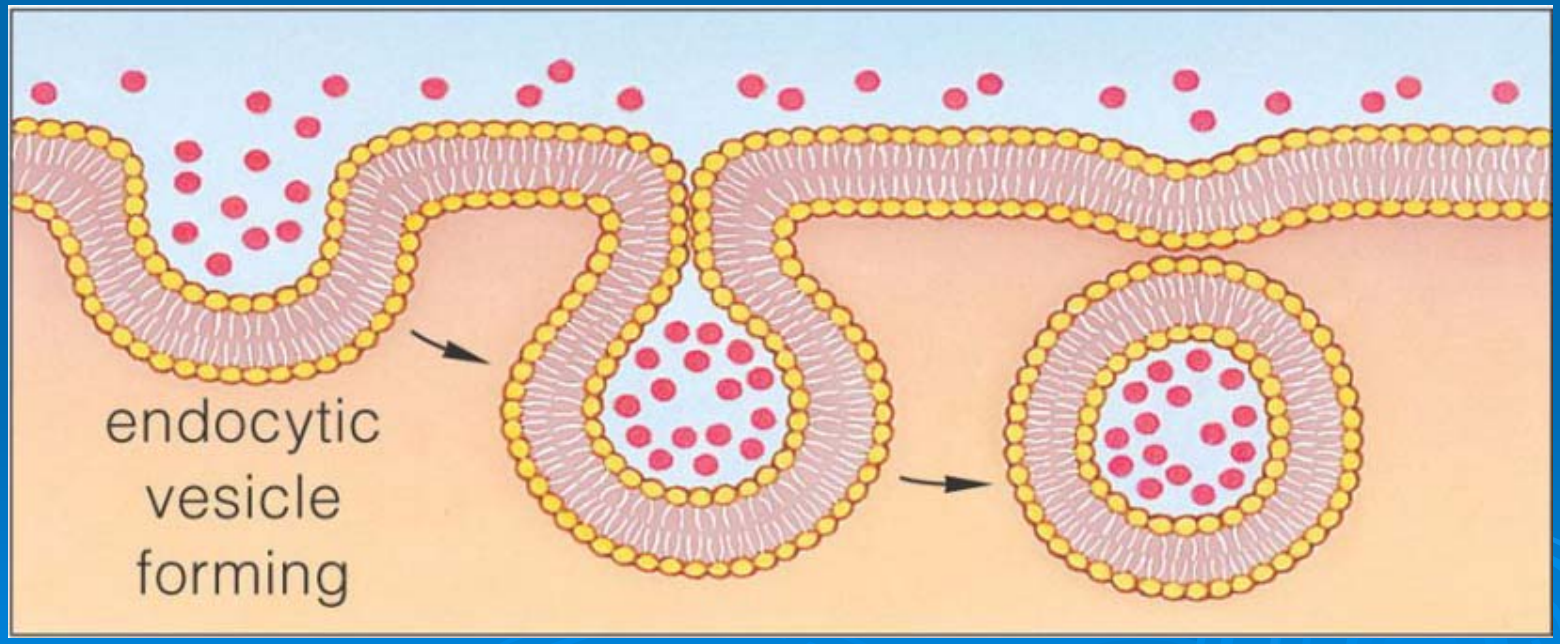
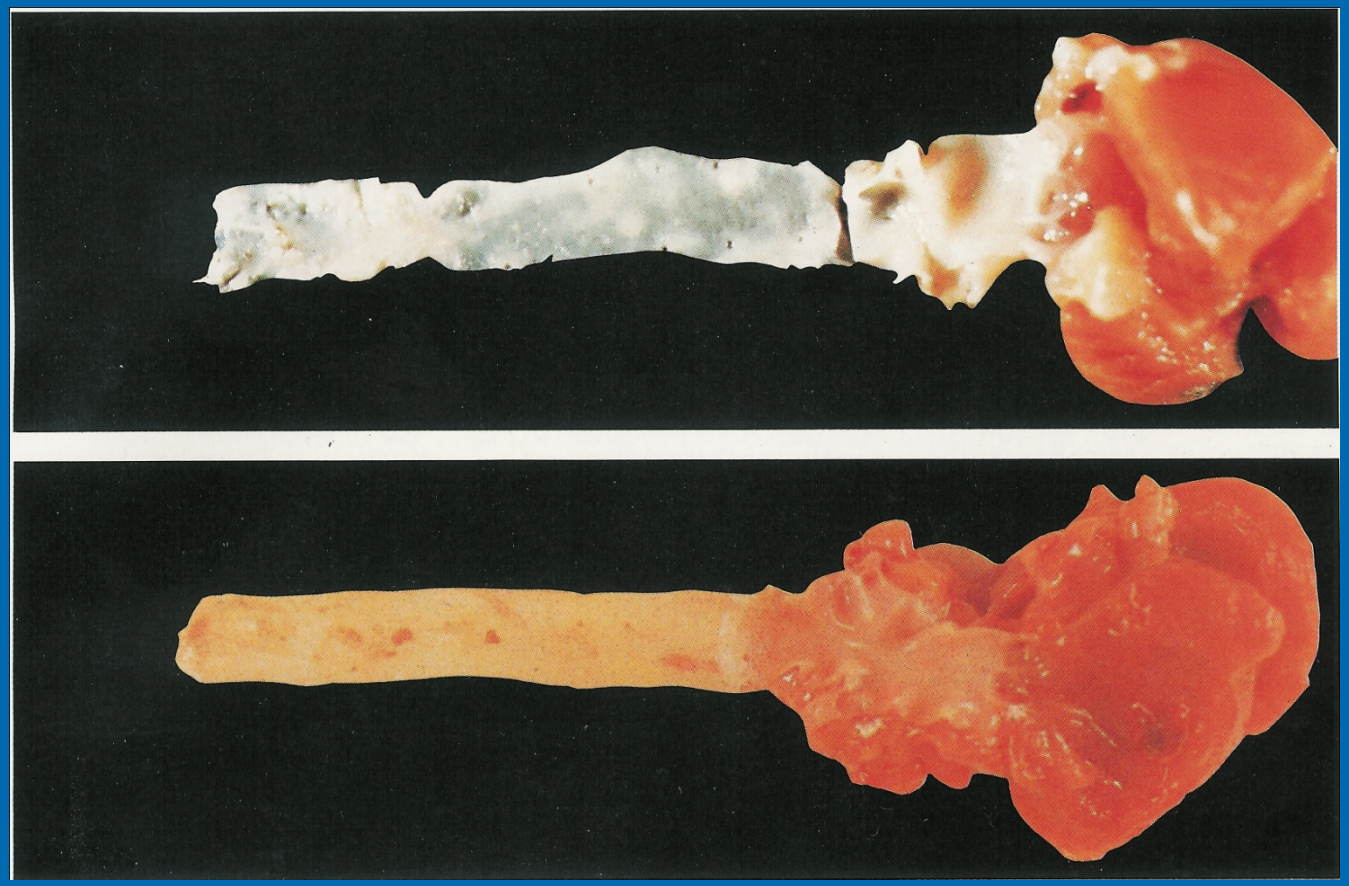
PPC inhibits endocytosis in smooth muscle cells

D.E. Bowyer et al (69) described a highly significant inhibition of endocytosis in the smooth muscle cells of pig aortas after in vitro incubation with PC. According to the authors these results suggest that PC effected an inhibition of atherogenic processes by reducing the endocytosis of plasma contituents.





After 2 months of high cholesterol diet. Note the nodular changes on the aortic valves and the intima.

After 2 months of high cholesterol diet and subsequent 2-month PC administration together with normal diet.

Semilunar valves, ascending & descending branches and aortic arch of a rat

L. Samocheowiec et al. (53)

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Animal Studies

- **Atherosclerosis induced in hypercholesterolaemic baboons by immunological injury; and the effects of i.v. polyunsaturated phosphatidylcholine** (56)

  Hower, Patelski,Bowyer and Gresham, Atherosclerosis 14: 17-29,1971

Groups of 5 – 8 baboons were fed either a control or a hypercholesterolaemic diet for 6 months. During the last 90 days each group was given either bovine serum albumine (BSA) to induce atherogenic injury or saline injections.

Only those animals with the cholesterol rich diet and BSA injections developed aortic and coronary sclerosis.

An i.v. injection of polyunsaturated soy phosphatidylcholine 3x/week

reduced the incidence and severity of aortic atherosclerosis.

Baboon Groups: 1. Atherogenic Diet, BSA
2. Atherogenic Diet, BSA, Phosphatidylcholine
3. Atherogenic Diet, Saline
4. Control Diet, BSA
5. Control Diet, no injections

Group	Number	Diet	BSA	PC	Aortic athero-sclerosis % area
1	8	A	+	-	46.4 ± 12.5
2	8	A	+	+	9.5 ± 4.4
3	5	A	-	-	0 ?!
4	5	C	+	-	0
5	5	C	-	-	0

Modification of aortic atheroma and fatty liver in cholesterol fed rabbits by iv. injection of saturated and polyunsaturated lecithins.(57)

14 Adams, Abdulla, Bayliss, Morgan J Pathol Becteril 1967 Jul; 94(1):77-78

New Zealand rabbits were divided into 3 groups. All groups were fed a cholesterol rich diet. One

group received ovolecithin injections (saturated) twice weekly and another group received phosphatidylcholine injections 4 times weekly.

Results

The control rabbits fed with a cholesterol rich diet showed fatty streaks and small atheromatous plaques in the arch and descending aorta from 4.5 weeks diet onward. Their livers appeared grossly fatty from 5th week on.

Cholesterol fed rabbits given ovolecithin injections showed more aortic atheroma than the control group, but their livers appeared less fatty.

Cholesterol fed rabbits given phosphatidylcholine showed no macroscopic evidence of either aortic atheroma or fatty liver. The blood plasma of this group appeared relatively clear and translucent, whereas the plasma of the other 2 groups was opaque.

Human Studies

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Effects on impaired coronary circulation

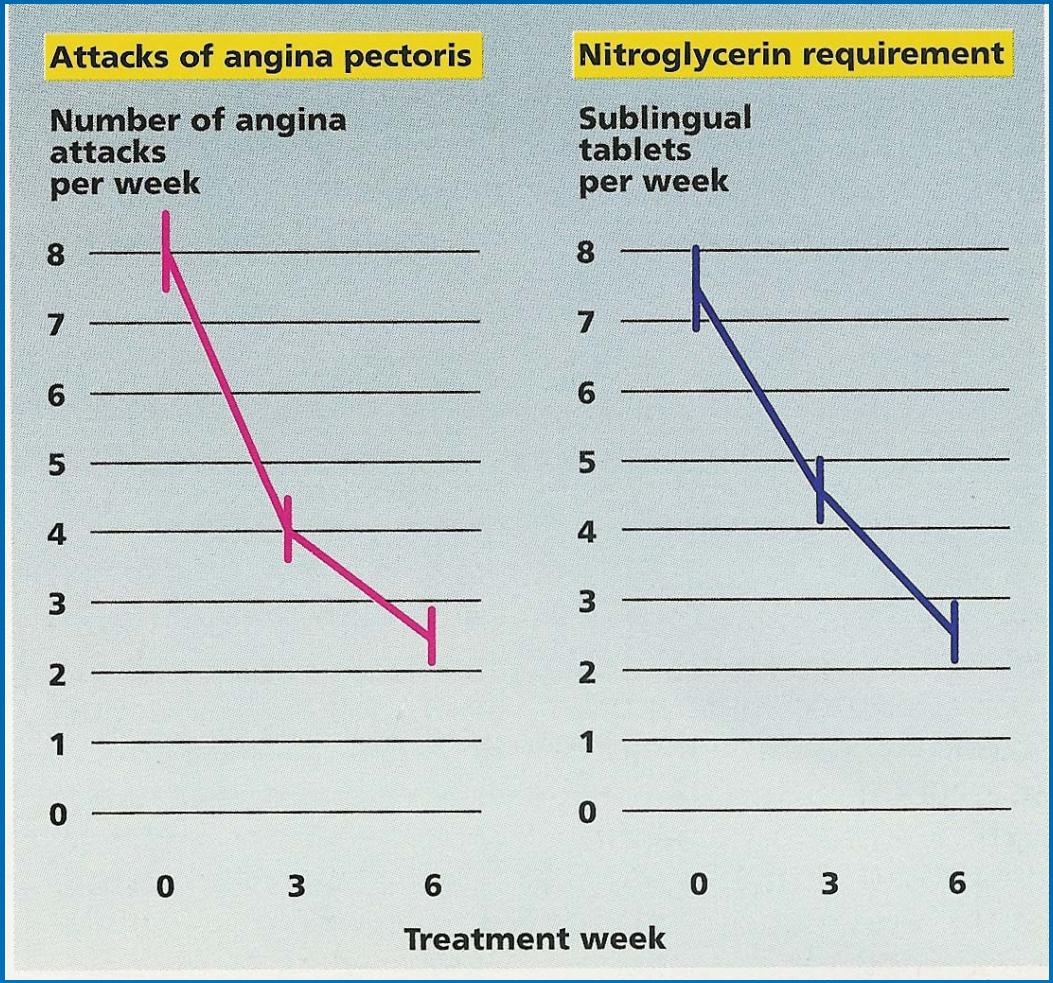
- On the basis of objective findings and subjective symptoms patients with coronary heart disease (various stages of angina pectoris) or postmyocardial infarction conditions were assessed for a possible improvement of their condition.
- **ECG:** (15,41, 59,60,61,62, 43,63,64,65,66,71)

  A number of studies have included ECG diagnostics
- Depending on the severity of the disease, the PC dosage and the duration of therapy, an improvement of ECG findings could be achieved in many cases.
- Among others, this was reflected in a dose-related reversal of pathologically changed terminal segments. S-T depressions were found to disappear; previously negative T-waves were reversed to positive.
- These favourable changes indicated a relief of stenocardiac complaints.
- Exercise tolerance as tested on the bicycle ergometer improved. The phase until S-T depression occurred became longer, with the depressions themselves being less distinct.

- **Incidence of Anginal Attacks, Nitro-Consumption:**

- All authors reported a decrease in anginal attacks.

- The investigations of V.A. Almazov et al. (41) included 34 male patients suffering from ischaemic heart disease and angina pectoris (stages III-IV); they received 500 mg/d of intravenous PC for a period of 14 days. 20 of the 34 patients reported an absence of anginal attacks already at the end of the first/beginning of the second week of treatment. The other 14 patients experienced a reduction of attacks from 8 to 10 within 24 h to 1 to 3 attacks within 24 h, with the severity decreasing as well. Daily nitro-consumption therefore, could be reduced to 2 to 5 doses as well.



Mean incidence of anginal attacks per week and consumption of nitroglycerin per week for patients with diminished coronary blood flow rates before and during a 6-week treatment with PC.(n=507)

Study by Hevelke et al

Symptoms decline fast → Motivation to continue Tx

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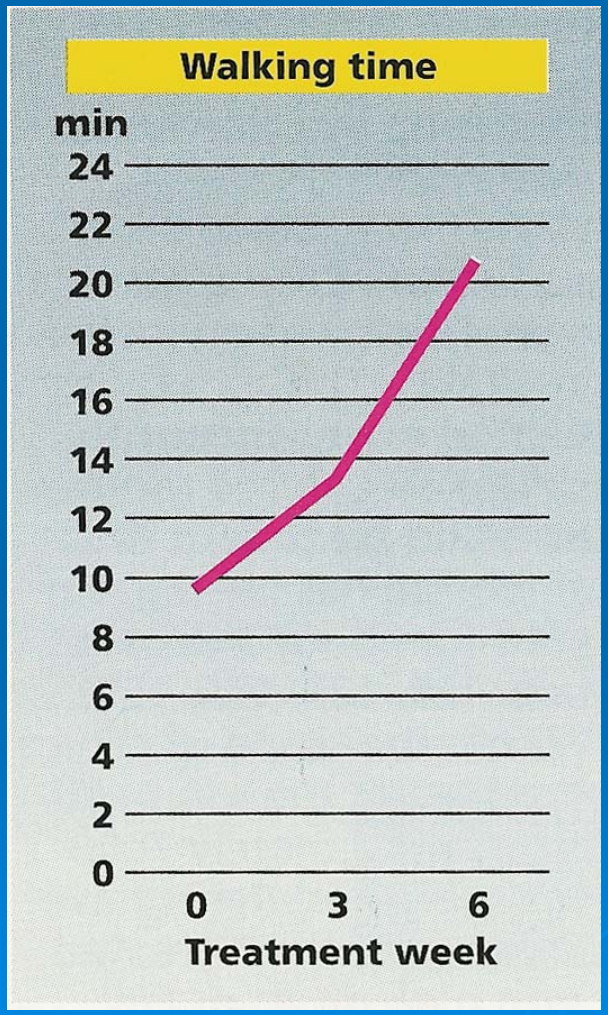
- **Subjective Symptoms:**

- For patients, the PC-related subsidence of subjective complaints was of particular significance. In many cases patients experienced an increase in their exercise tolerance without pain after prolonged treatment.

In the trial group of V.A. Almazov et al.[41] the walking distance without Stopping or requiring Nitroglycerin was extended from 30-50 m to 3000 m.

C) Effects on impaired peripheral circulation



Mean walking time in minutes of patients (n=282) before and during treatment with PC of 6 weeks.

Plaquex® Therapy

- **Improved well being & mental activity**
- In a controlled trial by L.D. Itkina et al. (62) geriatric patients with atherosclerosis suffered from fatigue, decrease in vitality, disturbed sleep, retrosternal pain, palpitation. On completion of the PC treatment 88 of the 94 patients reported a decrease in complaints and an increase in vitality. These changes were more pronounced after 2 months of treatment than after 1 month. Six of the patients did not experience any improvement due to the severity of the disease.

- An increase in the physical and mental activity of the patients after PC treatment was also observed by S.M. Idu et al. (61)

Case Histories

Patient 1

- **Calcium Score:**

  Before: 271.88 After:138.4

  Calcium Volume:

  Before: 220.16 After:140.4

Tx time: 3.5 months with 2 PC + 1 Chelation /week

Reduction of 49 % in Ca score and 36 % in volume

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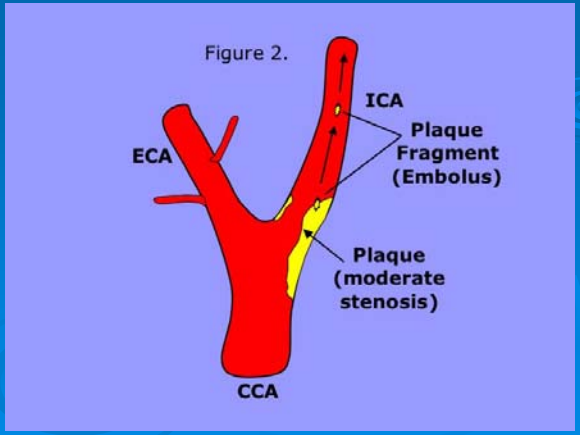
Patient 2

Carotid Stenosis

- This patient had a carotid stenosis of 75%. After 30 PC treatments it was reduced to 40%. 1.5 years later the stenosis increased to 95% due to the lack of maintenance therapy. She now had another 40 treatments and the stenosis is down to 60%. She will continue treatments to get it back down to 40% and then need maintenance therapy.



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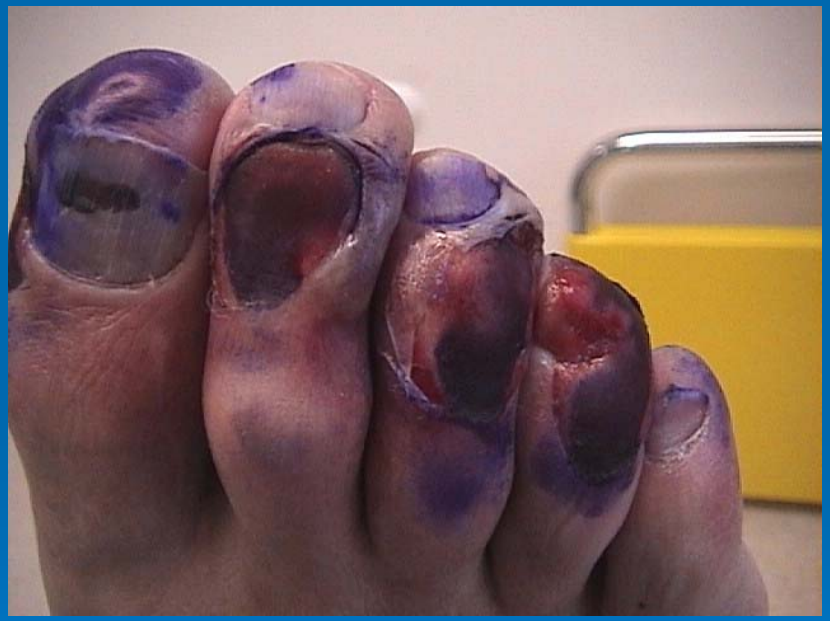
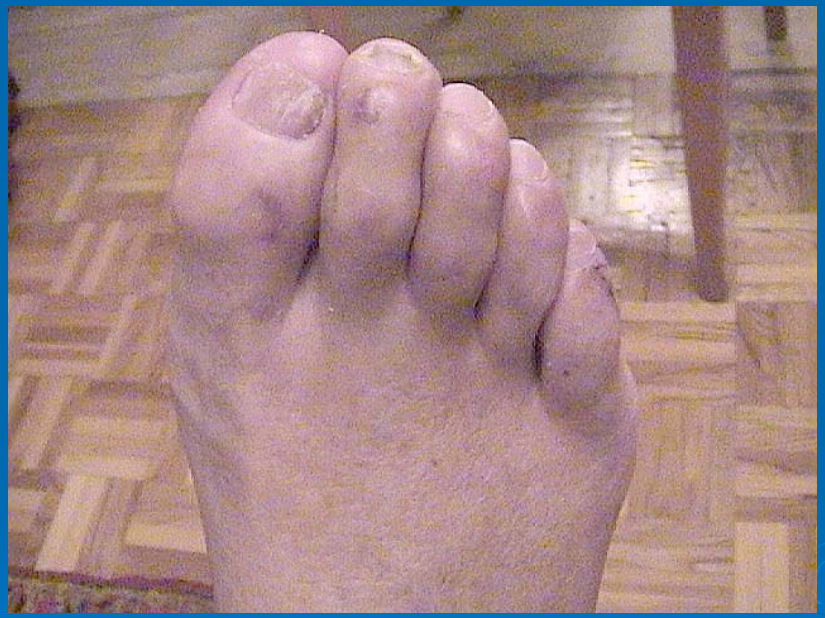
Patient 3

54 year old male Diabetic with Hepatitis C and Vasculitis of the toes and peripheral circulatory disease, causing difficult wound healing





After 6 Months with 20 Plaquex Infusions as well as 10 Vitamin C Infusions (7 g each). Completely healed after receiving the treatment.

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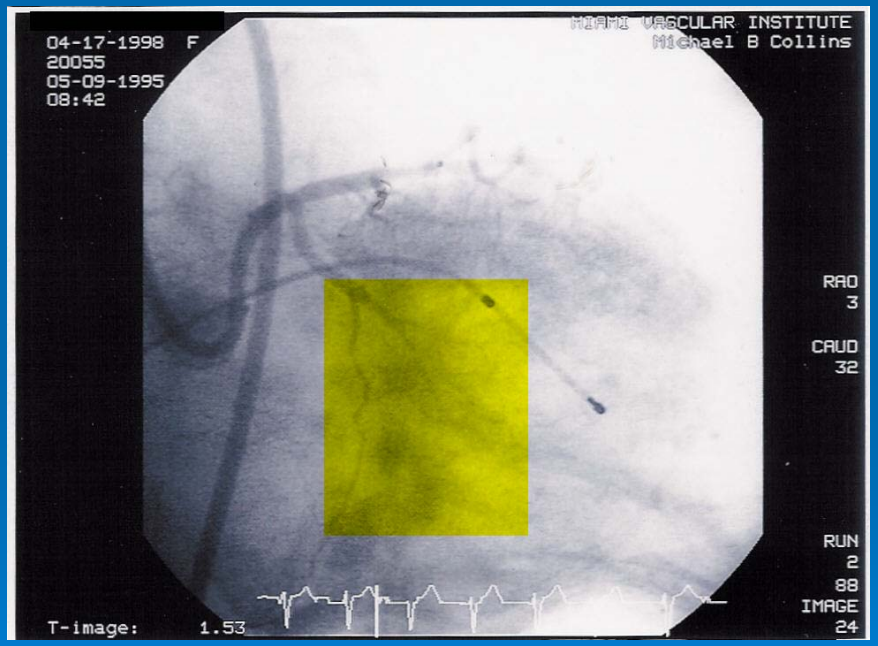
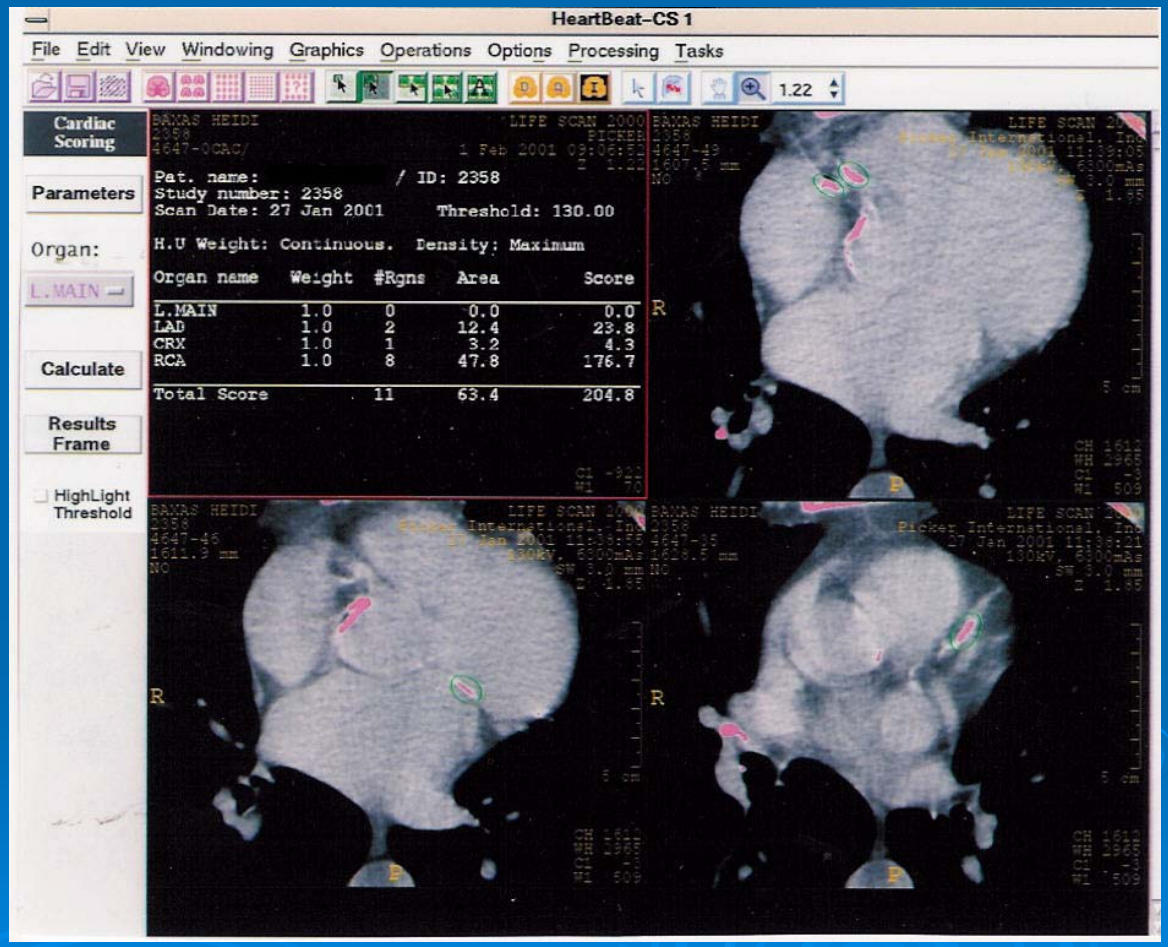
Patient 4

- 65 year old female patient with 90 % stenosis of the right coronary artery.



Plaquex® Therapy

- Fast CT results with Calcium Score 4 years following the Stenosis and after 20 Chelation and 20 Plaquex Treatments



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Score Summary:

Coronary Artery Name	Score
Left Anterior Decending	23.8
Left Circumflex	4.3
Right Coronary Artery	176.7
Left Main Artery	0
Total Score	204.8

!

Physicians' Report

___ Score of zero. Normal. No identifiable atherosclerotic placque.

___ 1 - 149. Mild identifiable placque. Possible mild or minimal coronary artery stenosis.

_X_ 150 - 499. Moderate identifiable placque. Possible mild or minimal coronary artery stenosis.

___ **500 - 999. Moderate to Severe identifiable placque. Likelihood of significant stenosis of at least one coronary vessel.**

___ **1,000 - to 10,000 or above. Severe identifiable placque. High likelihood of significant stenosis of more than one coronary vessel.**

Physician's Comments:

Report Date: January 30, 2001

Approving Physician: Virginia A. Syperda, D.O.

Signature on file

Patient 5

Fast CT Score	before	after
Total Score	1362.6	563.2
Number of Lesions	13	4

Treatment: 30 Plaquex infusions over 4-5 months.

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Patient 6

- 67 year old patient with claudication since several years. Pain in the right calf > left calf and a walking distance under 300 m, often even resting pain.
- Diagnosis: PAD Stage IIb.

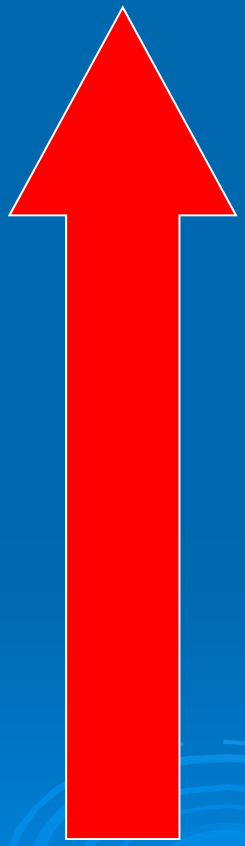
- Doppler Diagnosis: 90 % stenosis of the right A.poplitea and
- 70 % stenosis of the left A.femoralis sup.

Plaquex® Therapy

	Before Plaquex			After Plaquex	
	mmHg			mmHg	
A.tib.p. rechts	140			178	
A.tib.p. links	60			167	
A.dors.p rechts	170			180	
A.dors.p links	140			180	

Plaquex® Therapy

Summary of Effects

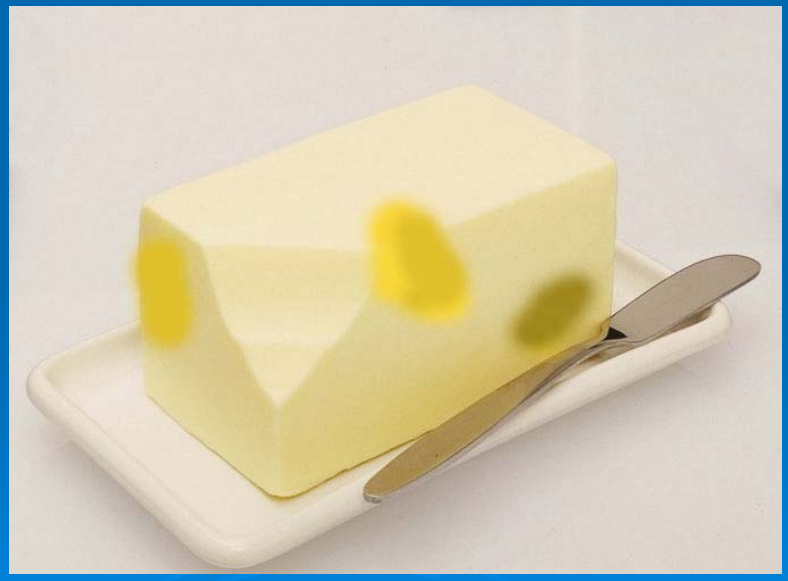


Plaquex® Therapy

Plaquex® Therapy

Plaquex® Therapy

2. Reduction of lipid peroxidation



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LCAT hard at work

3. Activation of Lecithin Acyl Transferase, Lipoprotein Lipase and Triglyceride Lipase

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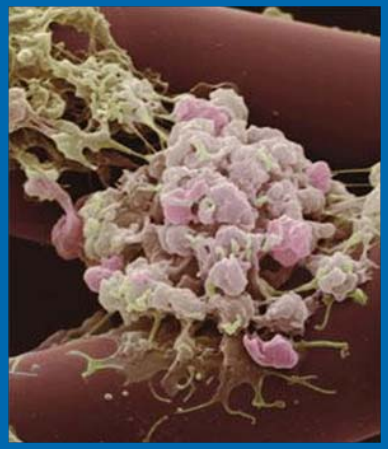
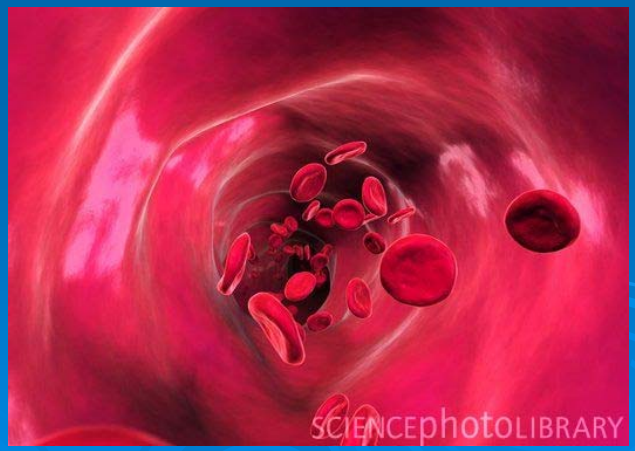
4 Effects on Hemorrheology

- Reduced Platelet Aggregation



- Increased RBC fluidity



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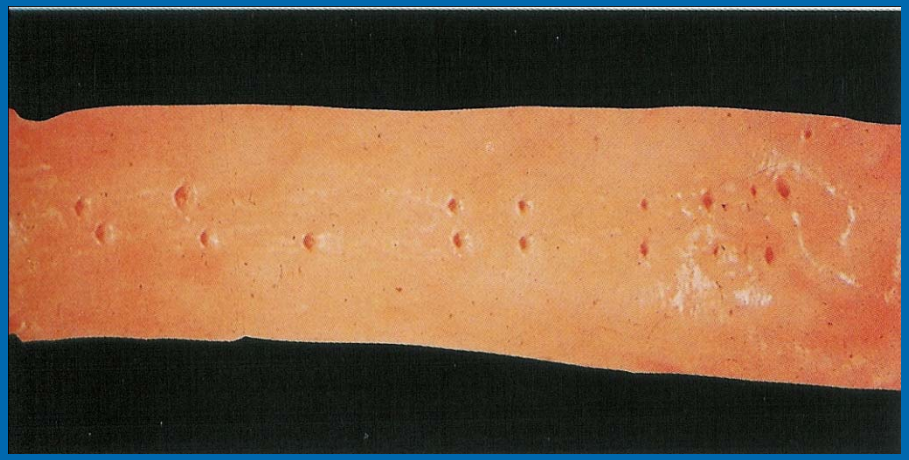
5 Atherosclerosis Reduction

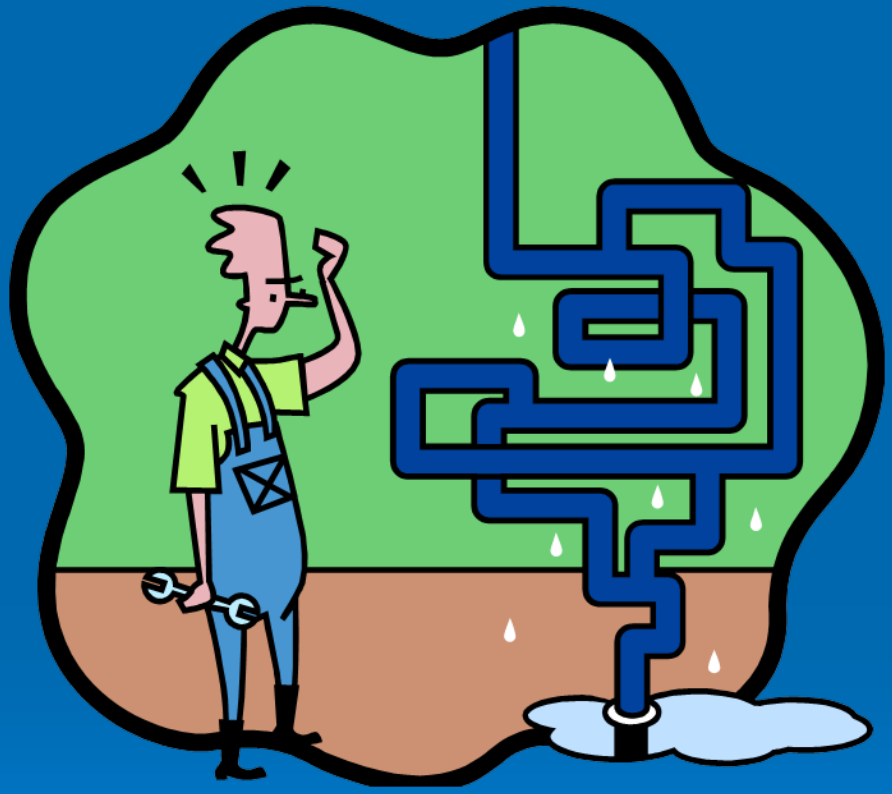


Aorta of a 44-year old woman. Status age-appropriate; remarkably tender intima virtually without lipid infiltration or fibrosis.

Aorta descendens of a 78-year old man with wide spread liposclerosis, hyalinosis, calcinosis and ulcerated atheroma.

Practical Application

How do I clean these pipes ?



Plaquex® Therapy

Indications

- Hyperlipoproteinaemia
- Atherosclerosis
  → Angina Pectoris, peripheral vascular disease, impaired cerebral and carotid circulation
- Nephrotic Syndrome
- Liver disease
- Fatty embolism
- Cognitive Dysfunction

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- **Contraindications:**
  due to the alcohol it should not be used in new-borns or premature babies
- **Side-effects:**
  Diarrhea, phlebitis* , drop in blood pressure when given too fast,very rare cases of hyper sensitivity, fatigue in Asians
- **Precautions:**
  To prevent thrombophlebitis the treatment protocol must be followed exactly.

* If using a bad product or not following instructions

Recommended Exams

- Lipid profile
- Homocysteine levels, CRP, Fibrinogen
- Liver profile
- Kidney profile (Dialysis patients have been able to reduce their treatments by 60% following 30 PC infusions and have 30% improved kidney function)

Prior tests: for ex. ECG, Angiogram, Fast-CT, Duplex Sonography, Echo cardiogram, Perfusion-PET, Carotid US depending on diagnosis

Medication history (earlier and actual Medications, Supplements)

Hair mineral analysis (toxic elements, such as heavy metals [lead, mercury], mineral deficiencies or excesses)

Urine status (Sediment, Microalbuminuria)

- **3. Important factor when choosing a PC product**
- **Most formulas use raw ingredients that have a low concentration of PC (30-60% PC). This can lead to the dissociation of deoxycholic acid from PC. This can lead to phlebitis and haemolysis that can even lead to kidney failure. It is important that the formula is made with a raw ingredient that contains at least 90 % PC.**

- There are only 2 raw ingredients, both made in Germany, that live up to this standard. One of them was the raw ingredient in Lipostabil and Essentiale N, both of which are no longer available.

- Only one compounded PC product in the US is made according to these standards and is identical to Lipostabil.

Application & Dosage

- Intravenous Application

With oral application only 5 –10 % of Phosphatidylcholine is found in the serum. 90 % ends up in the enterohepatic pathway during the first by-pass and is almost fully incorporated in to the liver cell membrane. With intravenous application 100 % of the biologically active Phosphatidylcholine is utilized.

Oral Application

-Reduces LDL

-Reduces Triglycerides

-Increases HDL

DOSAGE: start slowly with 1 x 900 mg/d and increase over a period of 2 weeks to 2 x 900 mg/d and then 3 x 900 mg.

Use after completion of the infusion series

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IV Treatment Schedule

- The half time time in Serum is 32 hours, therefore 2-3 treatments per week are recommended. If possible there should be 48 hour intervals between treatments.The basic treatment consists of 30 infusions.

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Maintenance Therapy

- In order to keep the patients condition stabilized it is recommended that they receive 1-2 treatments every month.

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➢ Dosage & Administration

PC should be mixed solely with

250 ml – 500 ml 5 % Glucose

or Dextrose (D5W)!

DO NOT MIX WITH ANYTHING ELSE !!

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- Length of the infusion

90 – 120 minutes !!!

If applied faster than the above time Phosphatidylcholine can very rarely cause thrombophlebitis. It can also cause a drop in BP.

Dosage schedule

1. Treatment: 20 ml PC (1000 mg)

2. Treatment: 30 ml PC (1500 mg)

From the 3rd treatment: 50 ml PC (2500mg)

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Caveat Dosage Changes

If the patient weighs less than **120 lbs.**, it is recommended to lower the dosage to **40 ml** for **treatments #3 – 30** (especially in Asian patients).

Asian patients should not be dosed higher than 40 ml as they tend to react with extreme fatigue.

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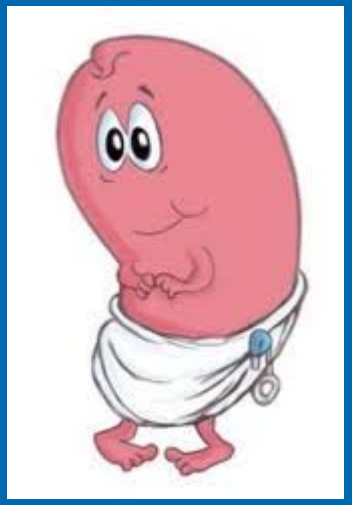
Make your patients comfortable

Plaquex® Therapy

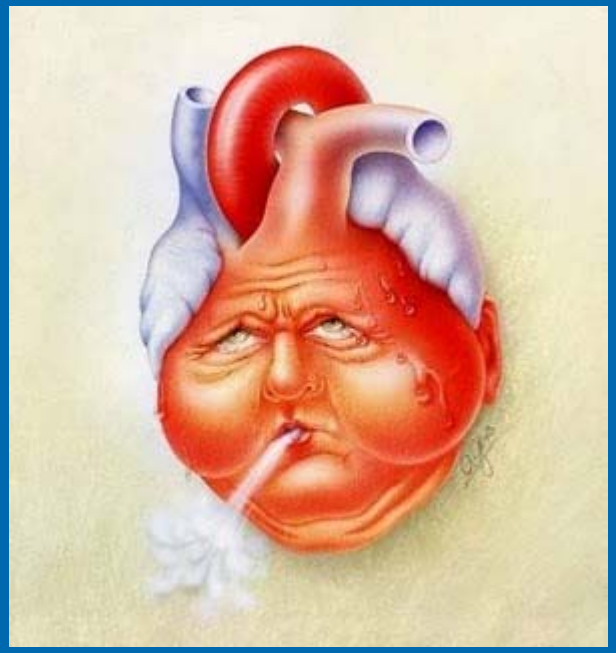
Plaquex® Therapy

Kidney Disease



- Dose depends on fluid tolerance

Congestive Heart Disease



- Fluid tolerance is limiting factor

5. FAQ

- Q: What ingredients are used in the ideal PC Formula ?
- A: *Polyenylphosphatidylcholine (PPC) 2500 mg, Deoxycholic Acid 1250mg, Vitamin E 0.01ml and Ethyl Alcohol 95% 0.12 ml* and sterile water.

  The raw ingredient used to make the formula must contain 90 % PC !!!
- Q: Can I mix the PC Formula with the chelation solution?
- A: *No. Chelation is a sodium chloride solution and the PC Formula can only be mixed with D5W (Dextrose 5% in water) or Glucose 5%.*
- *One after the other is OK*

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- Q: Can I mix the PC Formula into saline solution, e.g. for a diabetic patient?
- *A: No, PC can not be mixed in a saline solution. Only mix with D5W or Glucose 5%, even in a diabetic patient.*

. Q: What side effects can PC have?

- *Diarrhea in severely atherosclerotic patients, patients receiving treatments 3 times weekly*

- *Elevation of HDL, LDL and liver enzymes in the beginning, which will normalize with continuing treatment*
- *Fatigue*
- *Thrombophlebitis at the infusion site which can be avoided by observing the following rules of application:*

- How to avoid thrombophlebitis:
- *Use the correct PC product !*
- *Mix 500 cc D5W or Glucose 5% instead of 250 cc*
- *Use BD (Becton, Dickinson) or Braun Teflon catheters. Do not use Terumo catheters because they interact with the PC Formula and may cause thrombophlebitis. You can also use a Butterfly needle.*
- *Increase the infusion time to 120 minutes.*

Plaquex® Therapy

- Q:How should I store the PC Formula ?
- *A:Store PC in the refrigerator until it is ready to be mixed into D5W or Glucose for infusion. Do not store in the freezer.*
- *Q:What is the shelf life for PC ?*
- *A: If the vial has never been opened, shelf life is currently 6 months from the compound date. If the vial has had a needle insertion, USP standards are 30 days from the date of needle insertion, at which time any remainder should be discarded.*

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- Q: What is the pH of the PC Formula?
- *The pH is between 7.7 - 8.4.*
- *Q: Can I alternate PC and Chelation treatments?*
- *A: Yes, a recommended ratio of 2 PC to 1 Chelation, unless the patient has a severe heavy metal load, in which the treatment regimen should be 1 to 1.*
- *Q: Why does the PC/ D5W or Glucose 5% turn cloudy?*
- *A:The PC Formula should be at room temperature before mixing.*

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- Q: Can dialysis patients be treated with PC ?
- A: *Absolutely. It has been shown, that the PC can improve kidney function and these patients can reduce the frequency of dialysis treatments over time.* The limiting factor is the amount of fluids that can be tolerated.
- Q: How many treatments are recommended?
- A: *This depends on the severity of the problem. Some patients only need 20-30 treatments; others may need up to 60 treatments.*

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- Q:Is maintenance therapy necessary?
- A: *The underlying cause of plaque deposits will continue to cause a build-up of plaque in the blood vessels after PC treatments. For this reason, it is important to continue maintenance therapy after the initial 30 treatments. Severely ill patients should have maintenance treatments twice a month and all other patients should have maintenance treatments once a month.*

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IV Push ?

- Only low dose (5 – 10 cc/ 250 -500 mgPC)
- Given slowly over 5 – 10 minutes
- Serves only as PC supplementation
- Little effect on atherosclerosis and lipid profile

Plaquex® Therapy

References

- 1) Wong, E.K. et al: Lipids 15 (1980) 428 -433
- 2) A.K. Horsch et al Vasa 15 (1986) 275-279
- 3) Arsenio L et al ClinTer 114 (1985) 117-127
- 4) Murakami M., H. Sekimoto Unpublished reports no. 148 745
- 5) P. Saba et al Curr.Therap.Res 24 (1978) 299-306
- 6) H. Izumi et al. 11th Proceed Jap. Atheroscl. Soc., Tokyo 1979
- 7) Arsenio L. et al. Clin. Ter. 114 (1985) 117-127
- 8) Blagoskonov, A.S. et al. Kardologiya 26 (1986) 35-38
- 9) Cinosi, V. Sympos. Epidem. Prevenz dell`Aerteriscol. Cagliari, 1982 and: Round Table Phospholip. Atheroscleros. Rome, November 1984
- 10) Djuric, D. D. Manojlovic 1st Balkan Diabetes Congress, Beograd 1973
- 11) Fasoli, A. Therap. Select. Risk/Benefit Assess. Hypolip. Drugs, G. Ricci et al. (eds.) Raven Press: New York 1982, 257-262
- 12) Iwasaki, Y. et al. 11th Proceed Jap. Atheroscl. Soc., Tokyo 1979
- 13) Kataoka, A. Gendai no Shinryo 22 (1980) 1591-1583
- 14) Kirsten, R. et al. Int. J. Clin. Pharm. Therap. Tox 27 (1989) 129-134 and: in: Phosphatidylcholine (Polyenephosphatidylcholine/PPC): Effects on Cell Membranes and Transport of Cholesterol
- A.J. Archakov, K.J. Gundermann (eds.), wbn:Bingen 1989, 201-211
- 14) Maeda, A. et al. Gendai no Shinryo 22 (1980) 189-192 and 1461-1465
- 15) Serkova, V.K. Klin.Med. (Moscow) 64 (1986) 91-95
- 16) Suo, T. et al. Kiso to Rinsho 15 (1981) 3046-3051
- 17) Svanberg, U. et al. Nutr. Metabol, 17 (1974)338-346
- 18) Takeuchi, N. et al. Kiso to Rinsho 15 (1981), 5949-5967
- 19) Tomasevic, M. Unpublished reports no. 842 746
- 20) Goto, Y. H. Nakamura Praxis 55 (1966) 1235-1237
- 21) Uchida, S. Shinryo to Sinyaku 5 (1977) 1073-1076
- 22)Horsch, A.K. et al. VASA 15 (1986), 275-279
- 23)Zulic, J. et al. Medicinski Arhiv 39 (1985) 11-16
- 24) Zulic, J. et al. Medicinski Arhiv 35 (1981) 127-129
- 25) Kalmykova, V.I. E. B. Zakharova Sov.Med. 4 (1989) 5-9
- 26) Avogaro,P. et al. in: Phophatidylcholine (Polyenephosphatidylcholine/PPC): Effects on Cell Membranes and Transport of Cholesterol. A.I. Archakov, K.J. Gundermann (eds.), wbn:Bingen 1989, 65-68
- 27)Porokhnyak. L.A. et al. Antibiot.Med. Biotekhnol. 32 (1987)282-285
- 28) Skakun, N.P., N.Y. Steanova Antibiot.Med.Biotekhnol. 31 (1986) 781-783
- 29) Salvioli, G. et al. Il Fegato 21 (1975) 5-25 and: 4th Int.Sympos.Atheroscl. Tokyo 1976 and: Diab.Obes.Hyperlipoprot. Cupaldi, V. et al. (eds.) Academic Press:New York 1987

- 33)Blaton, V. et al. Artery 2 (1976) 309-325
- 34) Blaton, V. et al. Bull Soc.Pharm.Lille (1980) 3-4, 191-198
- 35) Gaskina, Tl.K. et al. Voprosy meditsiniskoi khimii 3331 (1987) 96-99
- 36)Takahashi, S. Shinryo to Shinyaku 17 (1980) 3051-3064
- 37) Desreumaux, C. et al. Arzneim.Forsch. (Drug Res.) 29 (1979) 1581-1583
- 38) Blaton, V. et al. FEBS Letters 44 (1974) 185-188
- 39) Zulic, J. et al. Medicinski Arhiv 23 (1978) 3-6
- 40) Yoritsune, M. et al. Gendai no Shinryo (1980) 836-842
- 41) Almazov, V.A. et al. Lipostabil Symposium Moscow, Nov 1984
- 42) Belousova, S.S. et al. Kardiologiya 25 (1985) 112-115
- 43) Merchan, R. et al. Acta Geront. 34 (1984) 242-253 and : Clin.Trials J. 21 (1984) 517-525
- 44) Helbig, W. Zeitschr. Inn.Med. 29 (1974) 675-678
- 45) Howard, A.N. et al. Atherosclerosis 14 (1971) 17-29
- 46) Howard, A.N. J. Patelski Atherosclerosis 20 (1974) 225-232
- 47) Howard, A.N. J. Patelski Verhandl.Dtsch.Ges.Inn.med 78 (1972) 1245-1248
- 48) Kuzna, W., D. Kadlubowska Pobiopharm Report 10 (1974) 20-30
- 49) Rosseneu, M. et al. Atherosclerosis 32 (1979) 141-153
- 50) Rozewicka, I. et al. Arch.Immun. et Therap. Exp 2 (1976) 233-242
- 51) Samochowiec, L. et al, 12th Workd Congr.Int.Soc. Fat Research Milan November 1974, Report no. 840500
- 52)) Samochowiec, L. et al. Polbiopharm Report 8 (1974) 3-39
- 53) Samochowiec, L. et al. Atherosclerosis 23 (1973) 305-331
- 54) Samochowiec, L. et al. Atherosclerosis 23 (1973) 319-331
- 55) Samochowiec, L. Unpublished report no. 850851
- 56) *Hower, Patelski,Bowyer and Gresham, Atherosclerosis 14: 17-29,1971*
- *57) 14 Adams, Abdulla, Bayliss, Morgan J Pathol Becteril 1967 Jul; 94(1):77-78*
- 58) Rudofsky, G. et al. in: 50th Anniversary of Phospholipid Research (PC). K.J. Gundermann, R. Schumacher (eds.) wbn:Bingen 1990, 185-195
- 59) Almazov, V.A. et al. Kardiologiya 26 (1986) 39-42
- 60) Balansard, P. Unpublished report no. 842 301
- 61) Idu, S.M. et al. Viata Medicala 17 (1970) 297-305
- 62) Itkina, L.D. et al. Lipostabil Symposium Moscow, Nov 1984
- 63) Mohamedi, C. Fortschr. Med. 89 (1971) 893
- 64) Obata, K. et al. Unpublished report no. 840 754
- 65) Pristautz, H. et al. Wiener Med.Wschr. 124 (1974) 644-648
- 66) Seki, H. et al. Gendai Iryo 6 (1972) 599-618

- 67) Luczac, Z.R. R. Leutschaft Unpublished report no. 842 762
- 68) Pristautz, H. Münch.Med.Wschr. 117 (1975) 583-586
- 69) Bowyer D.E. Et al. Med Welt 30 (1979) 1447-1448
- 70) Khursheed P. Navder et al Athersclerosis 1520 (2000) 89-95
- 71) Kukes, V.G. et al. Kardiologiya 18 (1978) 79-82 and: Lipostabil Symposium Moscow Nov 1985
- 72) Saba, P. et al. Curr. Therap. Res. 24 (1978) 299-306
- 73) Uchida, S. Shinryo to Sinyaku 5 (1977) 1073-1076
- 74) Unter, E. et al. Zbl.Ges. Inn. Med. Grenzgeb. 18 (1962)

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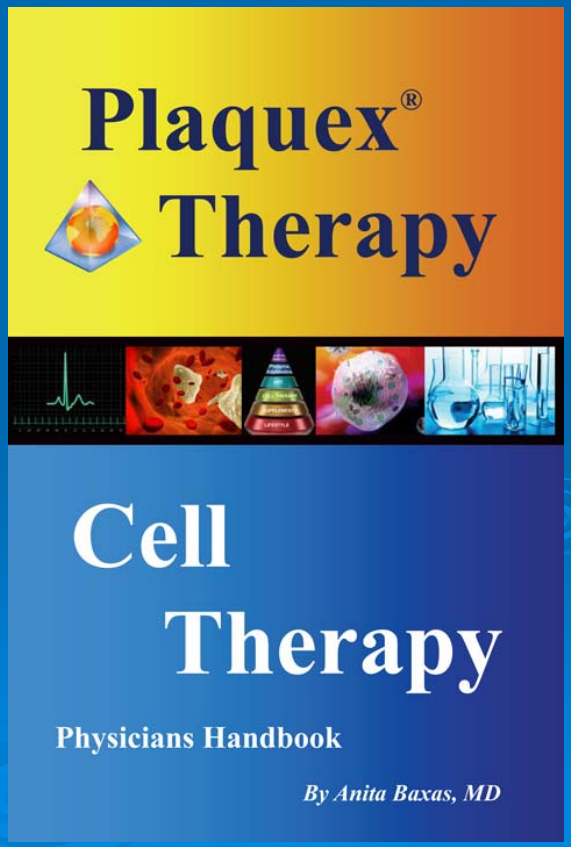

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