



Diarre og NET
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What is **Diarrhea ?**





levermavetarm_auh



BRISTOL STOOL CHART



Type 1

Separate hard lumps

Very constipated



Type 2

Lumpy and sausage like

Slightly constipated



Type 3

A sausage shape with cracks in the surface

Normal



Type 4

Like a smooth, soft sausage or snake

Normal



Type 5

Soft blobs with clear-cut edges

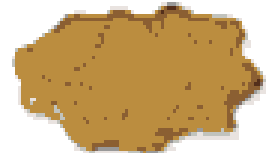
Lacking fibre



Type 6

Mushy consistency with ragged edges

Inflammation

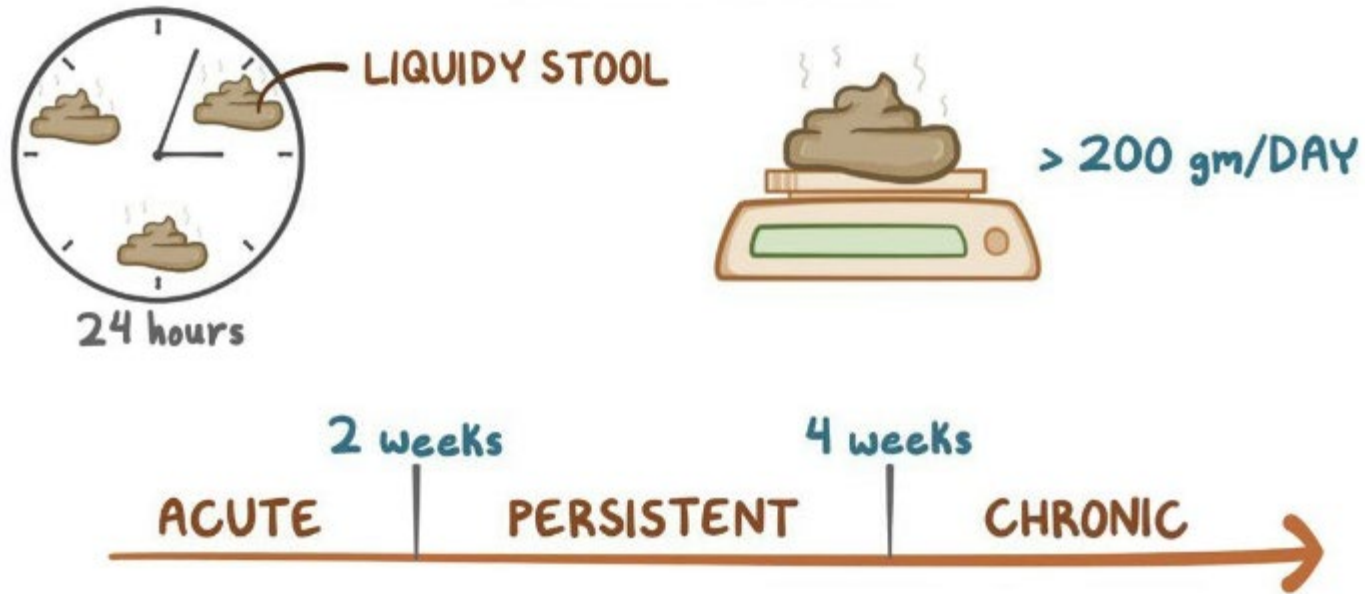


Type 7

Liquid consistency with no solid pieces

Inflammation

DIARRHEA

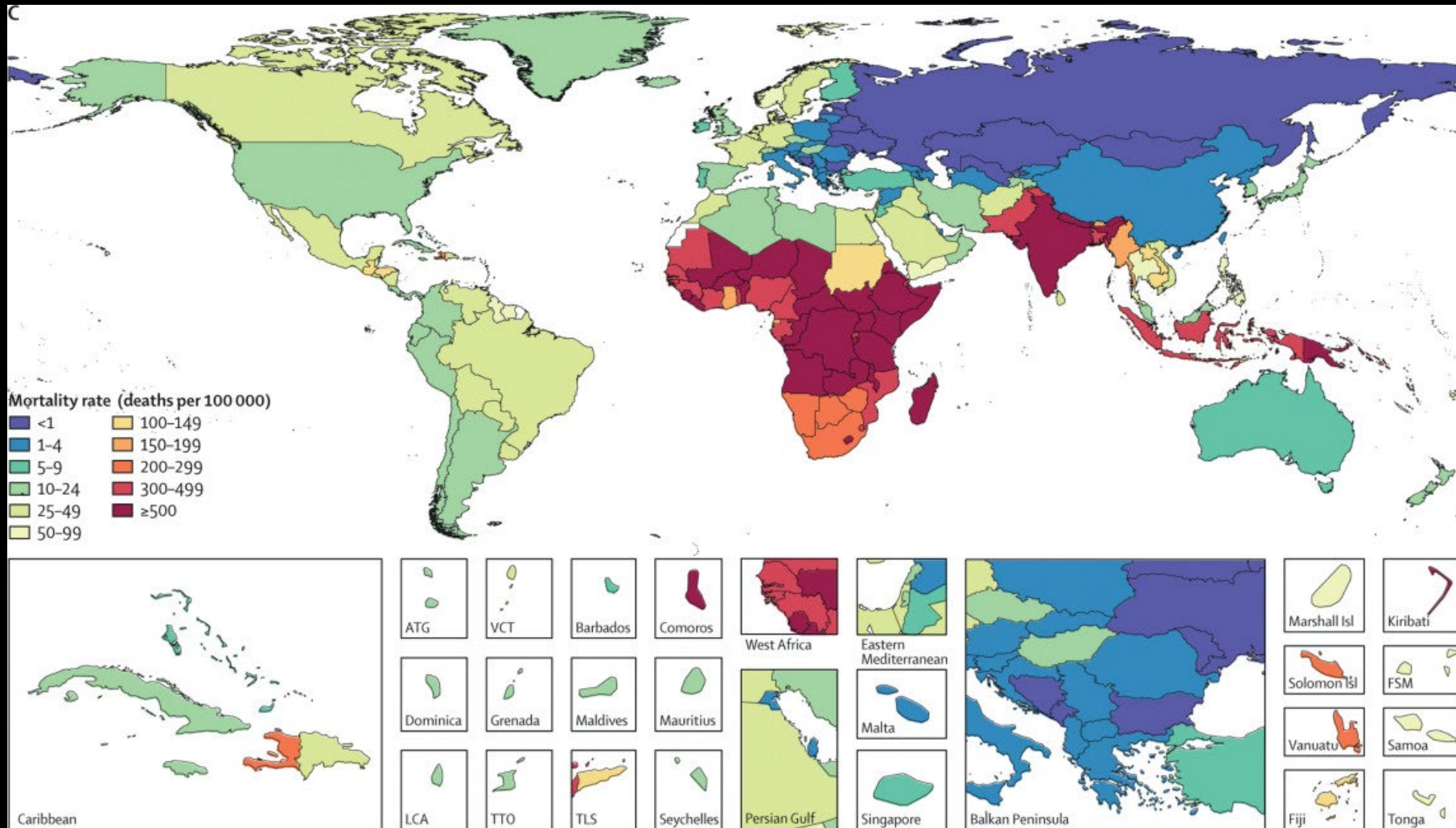


- > 3 tynde afføringer i døgnet eller > 200 gram
- Akut og kronisk diarre

Hyppig sygdom på verdensplan

- Roskildesygge (Norovirus)
- Rotavirus
- Bakterier: Salmonella, Campylobacter, Yersenia.
- Rejsediarré skyldes oftest en infektion med bakterien E. coli
- 95 procent går over af sig selv
- Kræver sjældent udredning eller behandling.

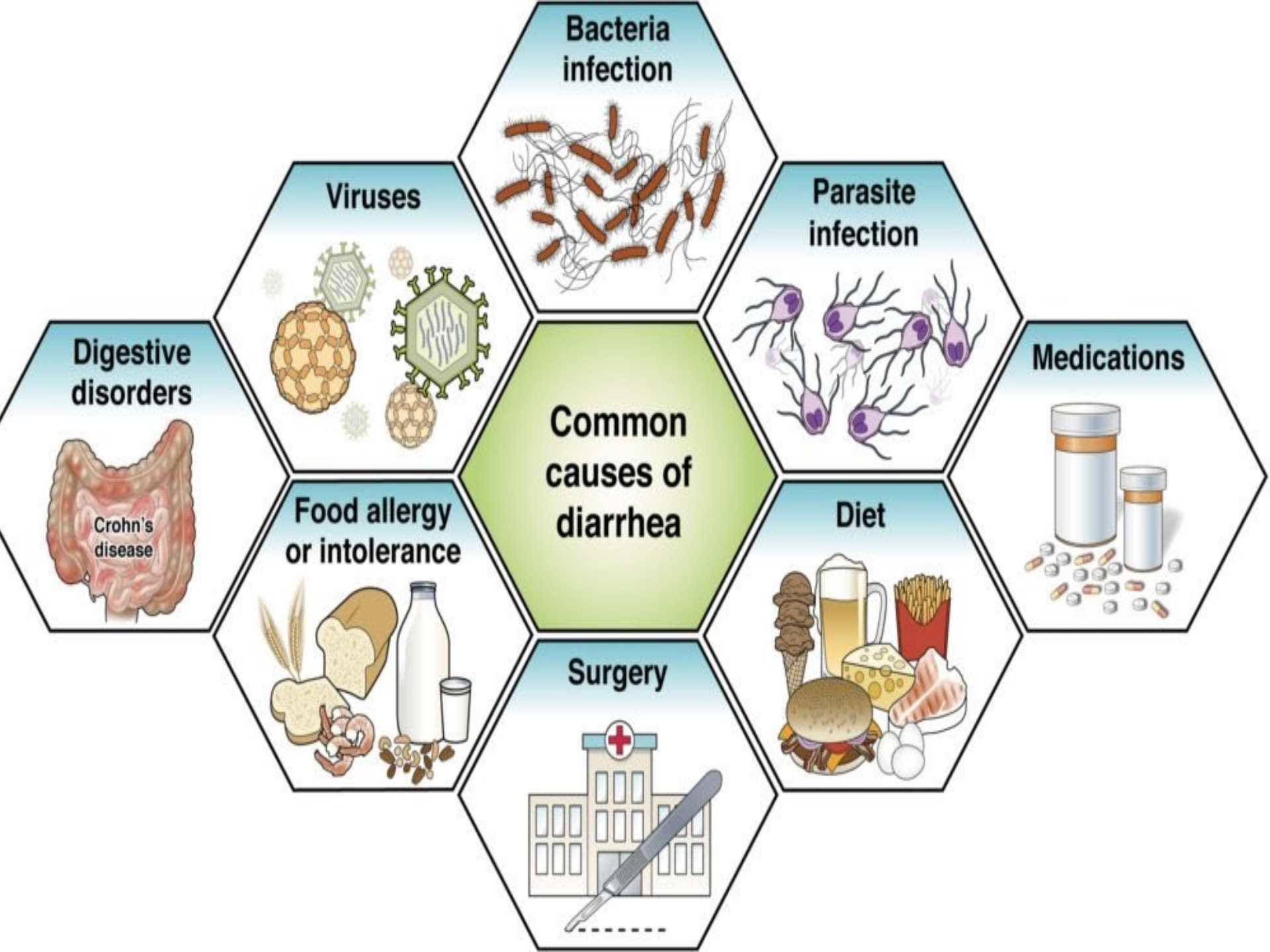
Dødelighed ved diarre



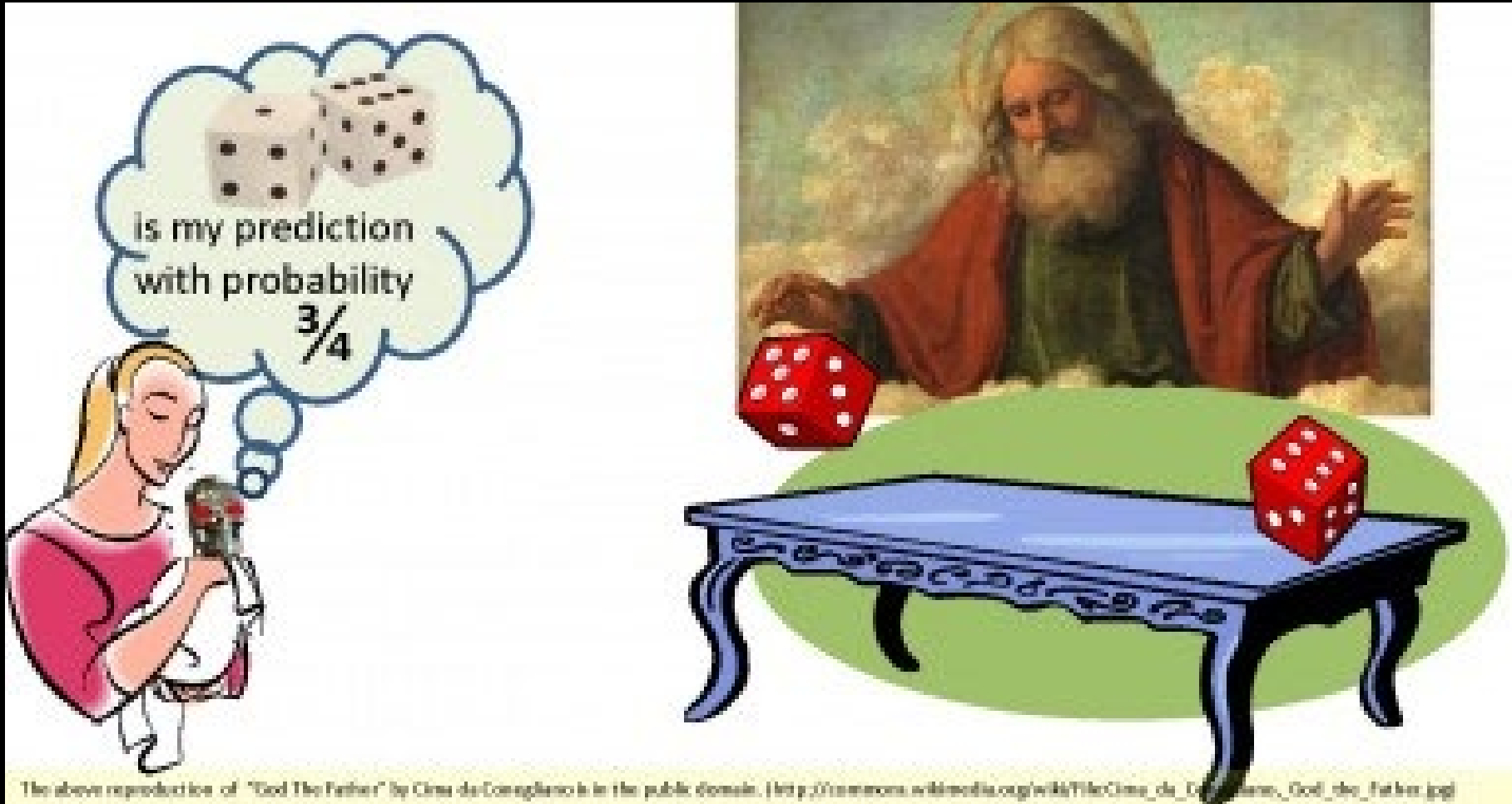
Kronisk diarre

Vurdering af kronisk diarré

- Yngre
 - Irritabel tarm. Vekslede afføring og smerter
 - Inflammatorisk tarmsygdom
 - Glutenintolerance (Cøliaki)
 - Medfødt laktoseintolerans er sjældent, erhvervet hyppigere.
- Ældre
 - Kræft i tyktarmen
 - Mikroskopisk kolit.
 - Forstoppelse (sterkoral diarré).

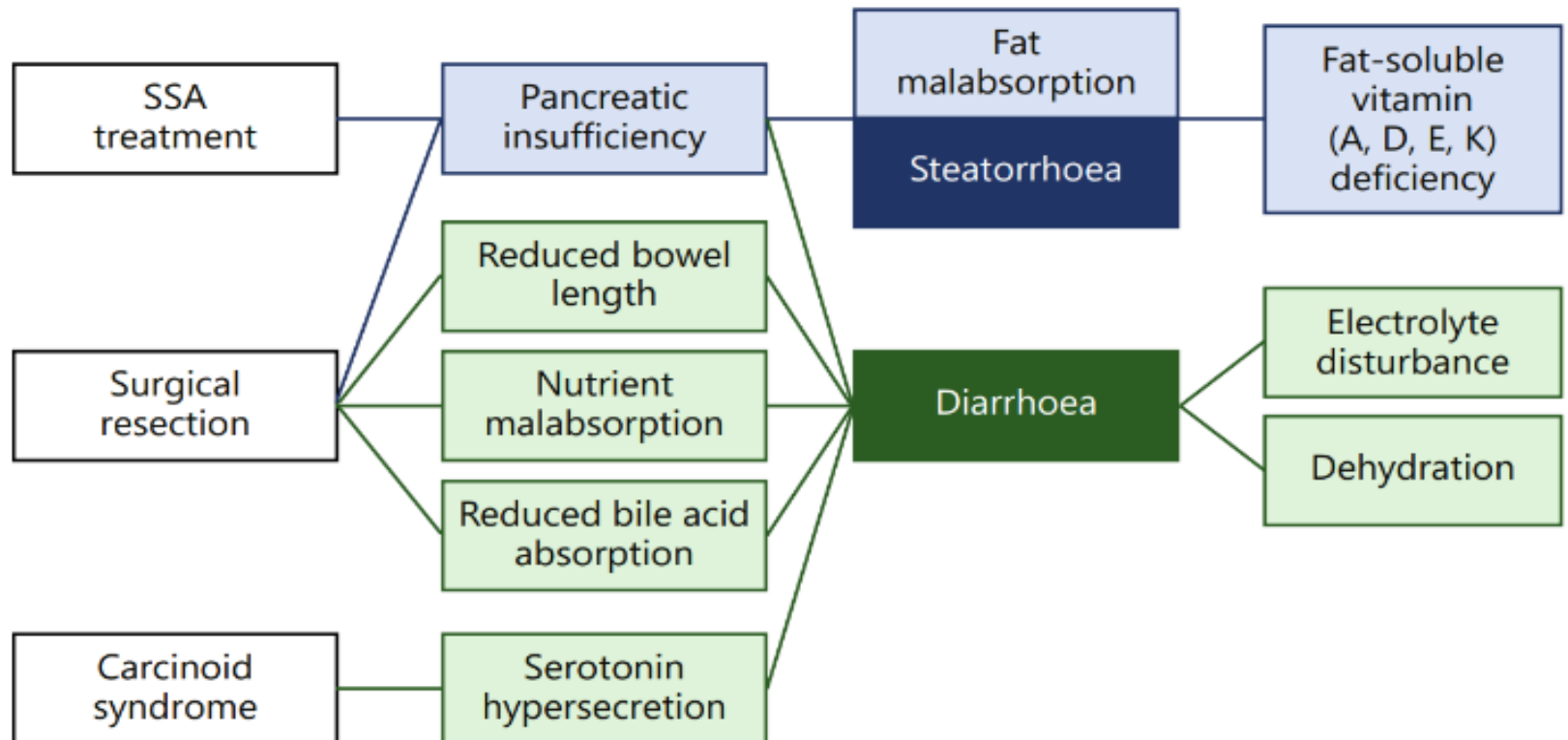


Patient med diarre i et NET ambulatorium



The above reproduction of "God the Father" by Cimabue is in the public domain. (http://commons.wikimedia.org/wiki/File:Cimabue_-_God_the_Father.jpg)

Årsager til diarre i NET patienter

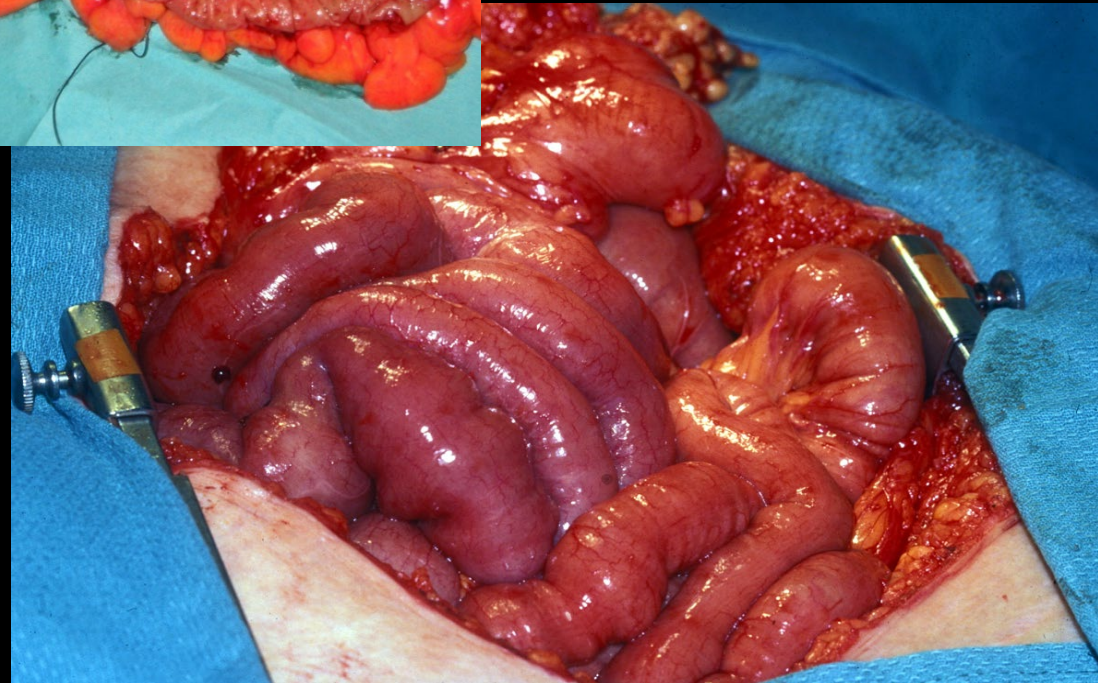
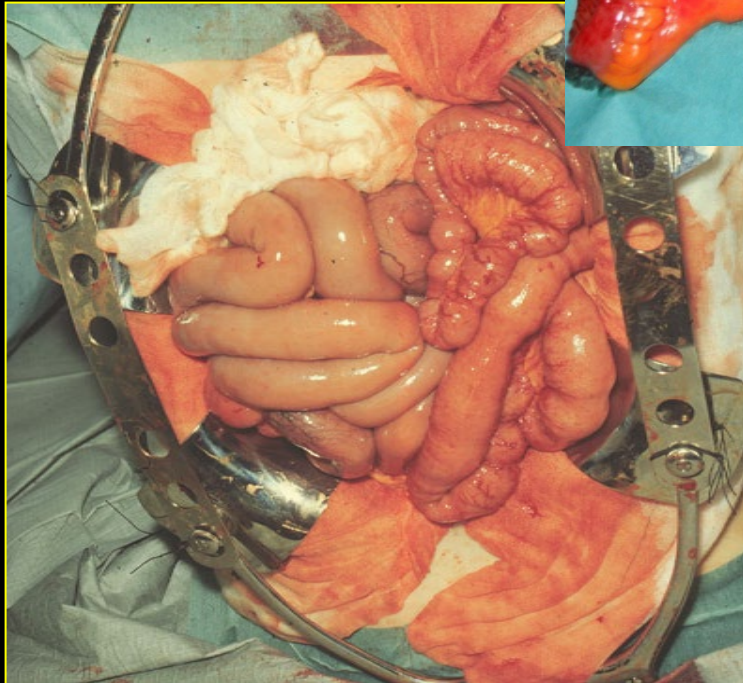
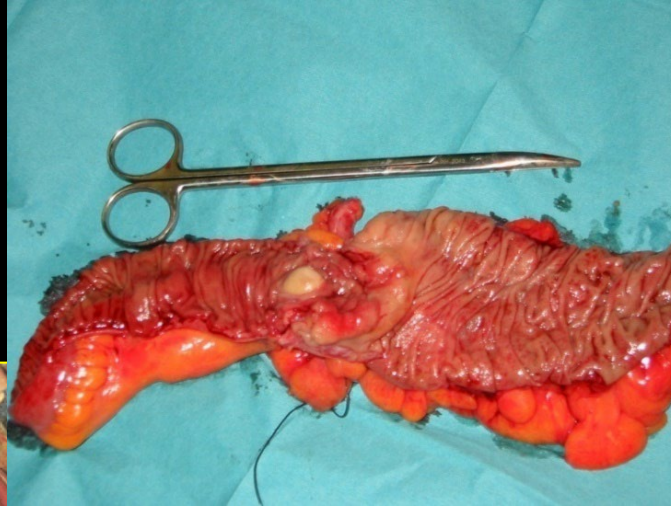


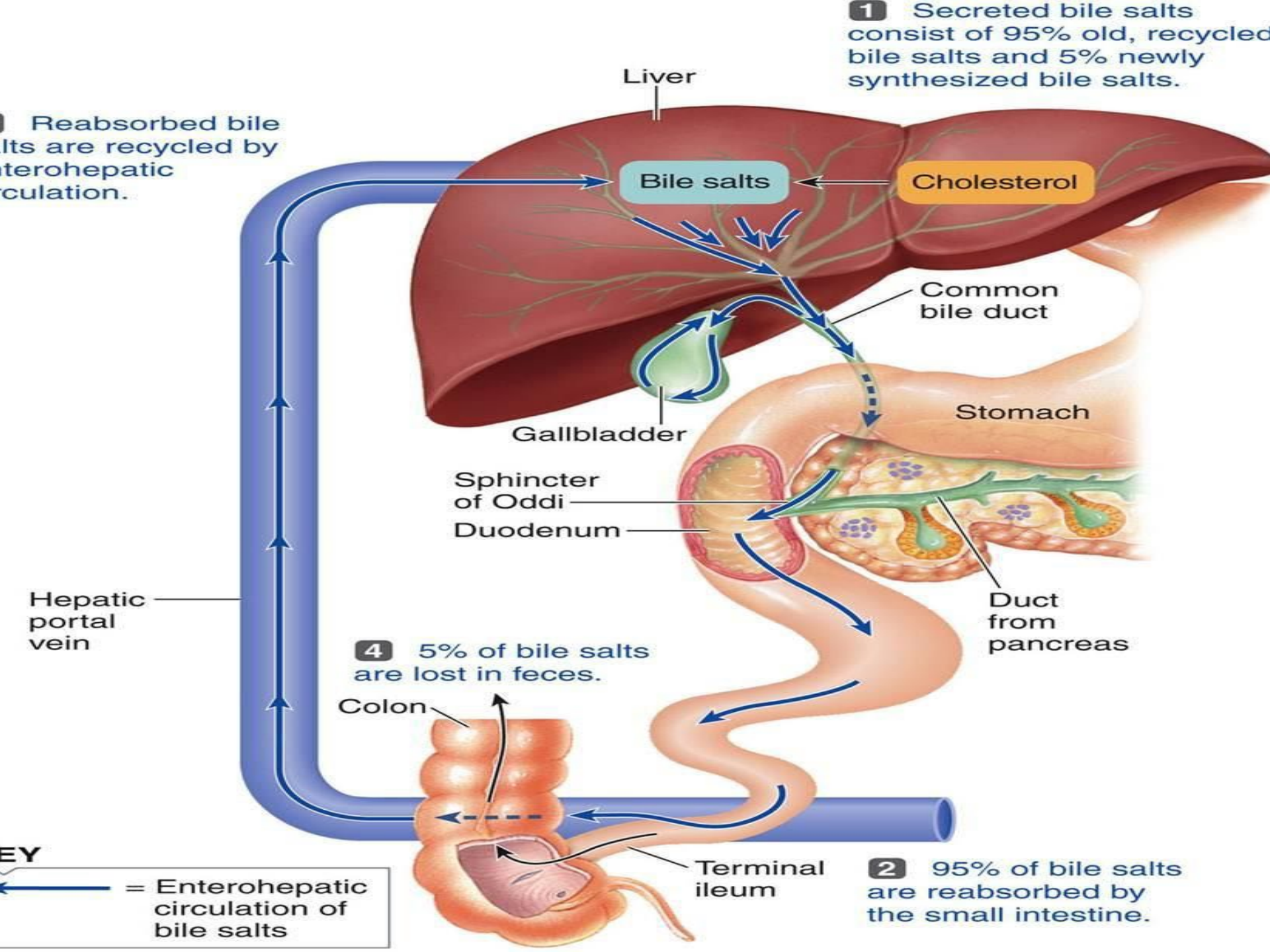
Kirurgi forstyrrer fordøjelsen

- Tyndtarmskirurgi og kirurgi på høj side af tyktarmen kan give diarree



Tyndtarmsresektion





Reabsorbed bile salts are recycled by enterohepatic circulation.

1 Secreted bile salts consist of 95% old, recycled bile salts and 5% newly synthesized bile salts.

2 95% of bile salts are reabsorbed by the small intestine.

4 5% of bile salts are lost in feces.

KEY = Enterohepatic circulation of bile salts

Årsag til galdediarre

- Extra galde i tyktarmen
 - øger tarmbevægelser
 - øger vand sekretion
 - Nedsætter vand absorptionen

Symptoms of Bile Acid Diarrhea



soiling accidents



bloating



watery diarrhea



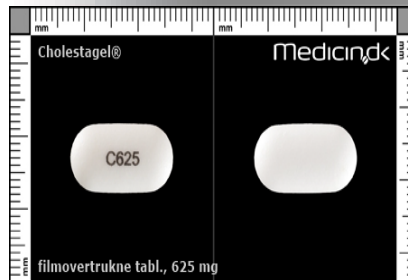
diarrhea with urgency



diarrhea in the middle
of the night

- Galdesyrebinder
 - Colestyramin
 - Cholestagel

- Galdesyrehæmmer
 - Victoza

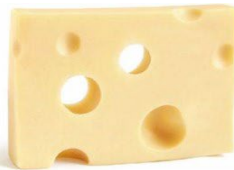


Kostintervention

- Fedt stimulerer frigivelse af galde
- Fedt-reduceret diæt



AVOKADO



OST



MØRK CHOKOLADE



ÆG



FISK



NØDDER



KOKOSNØD



FEDT HOLDIGT
YOGHURT



OLIVENOLIE



CHIA FRØ

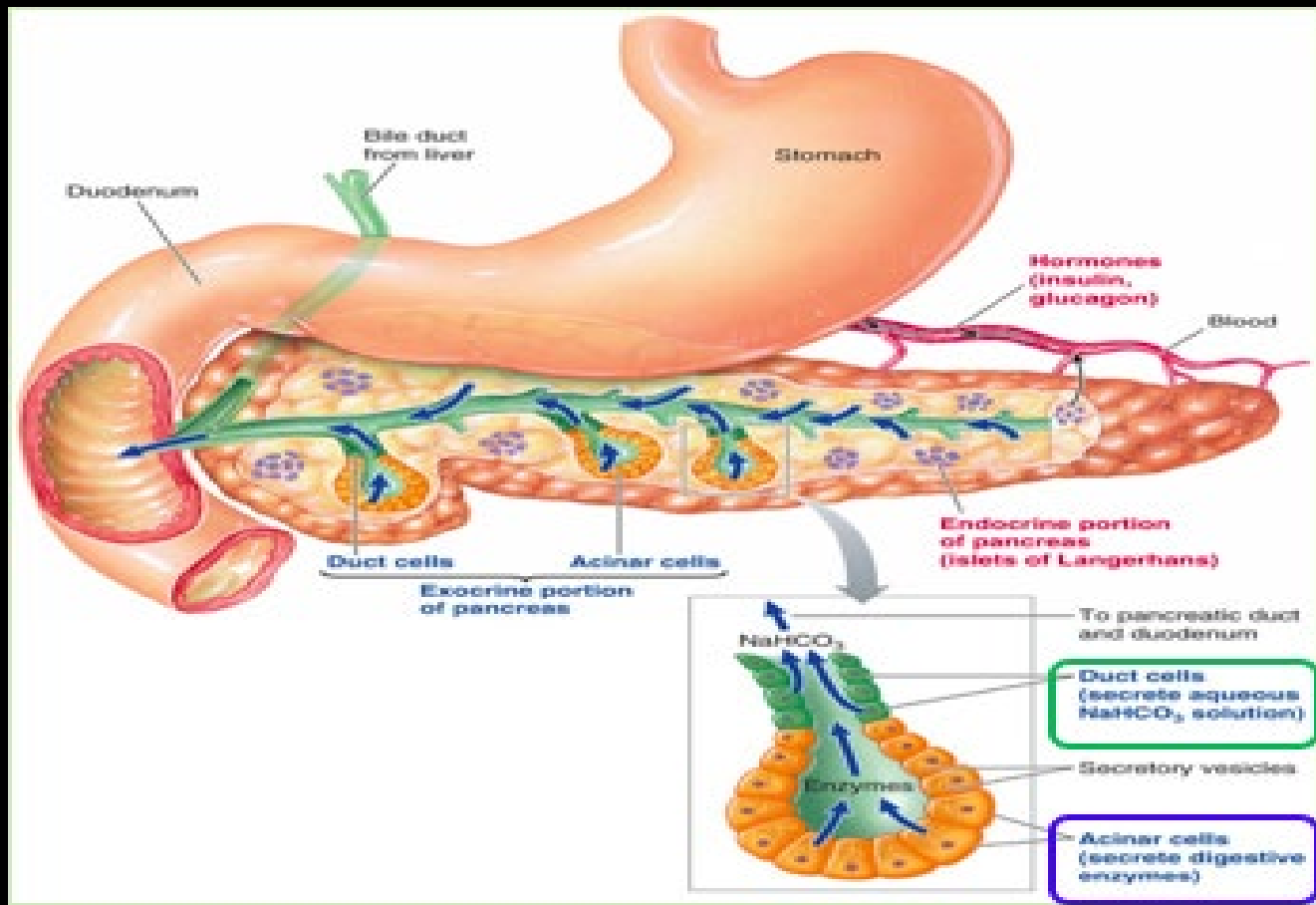
Tyndtarmskirurgi

- >70 cm fjernet
 - Risiko for B12 mangel >40%
- Hvis <200 cm tyndtarm tilbage
 - Test for fedt-opløselige vitaminer



Somatostatin analoger (SSA)

- Forstyrrer bugspytkirtlens fedt og vitamin optagelse

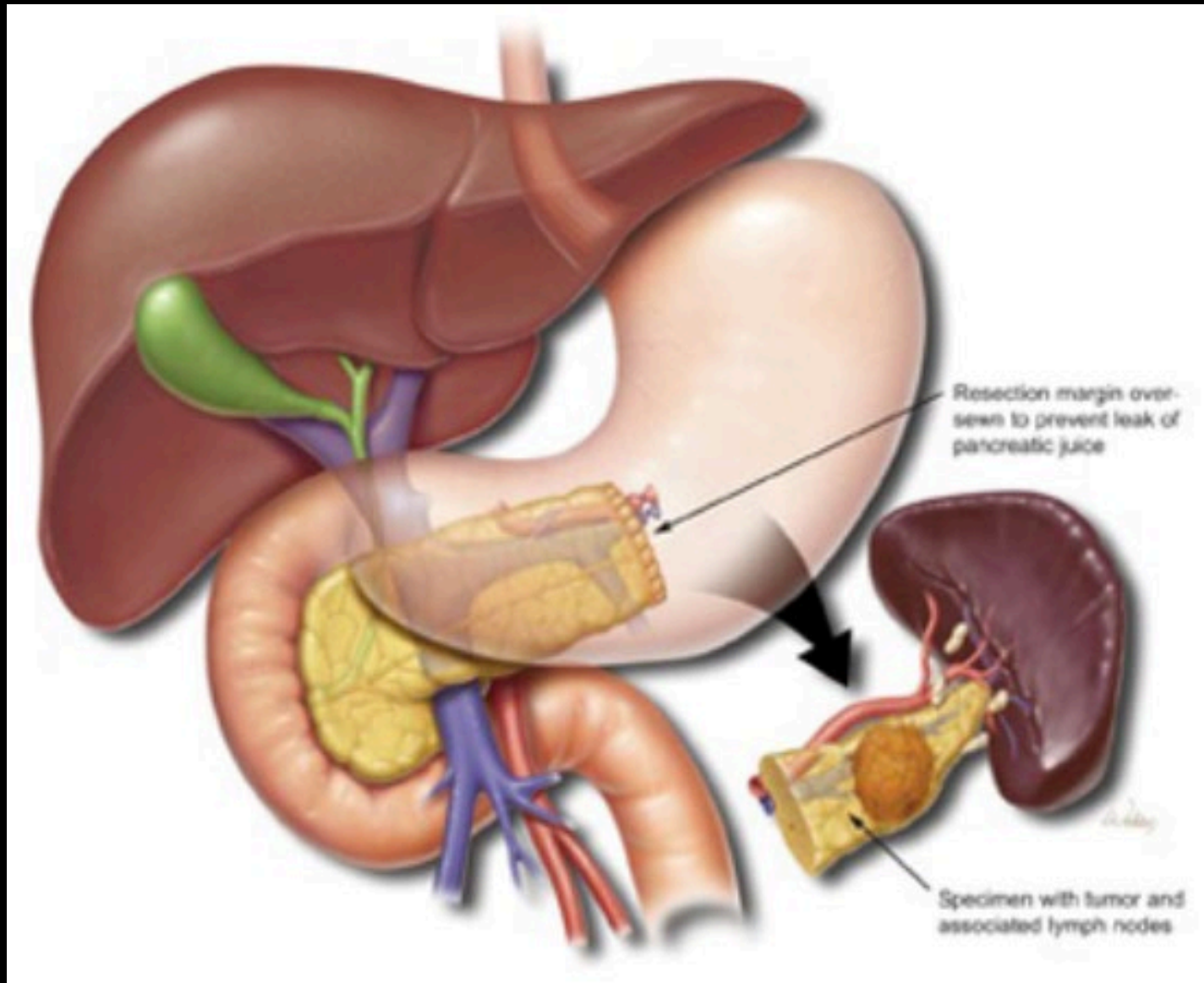


Somatostatinanaloger

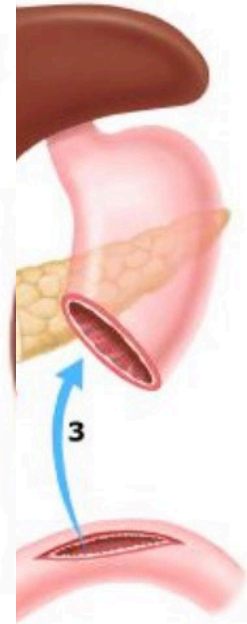
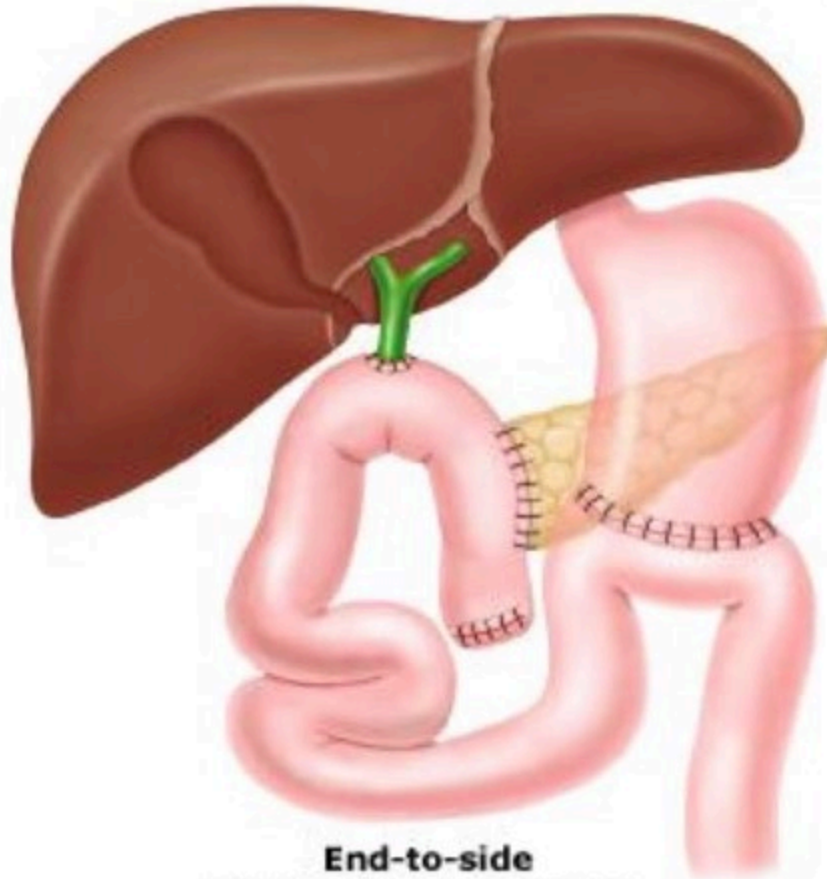
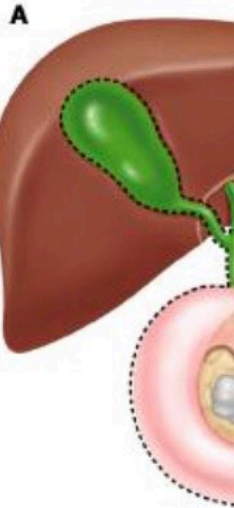
- Behandling >18 mdr
- 80% havde mangler mindst 1 fedtopløsligt vitamin (Fiebrich et al)
- Mål de fedtopløselige vitaminer en gang årligt

Pancreas surgery

Distal Pancreatectomy



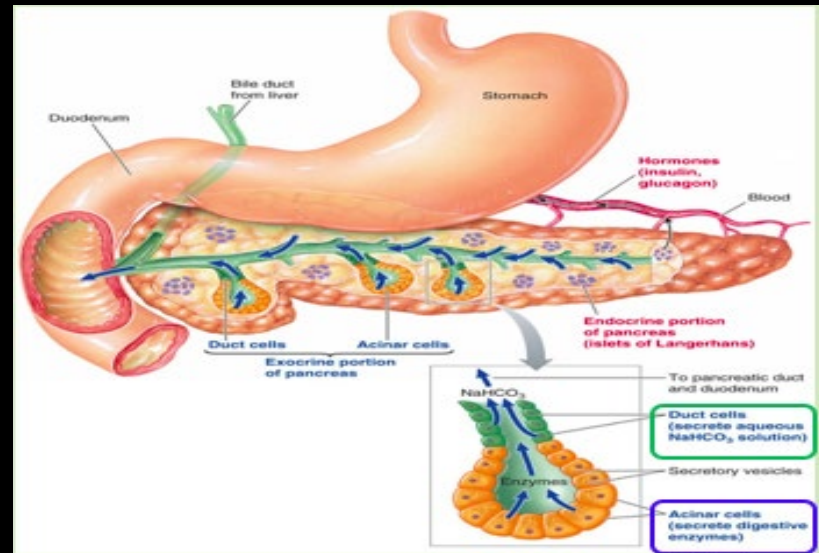
Whipple

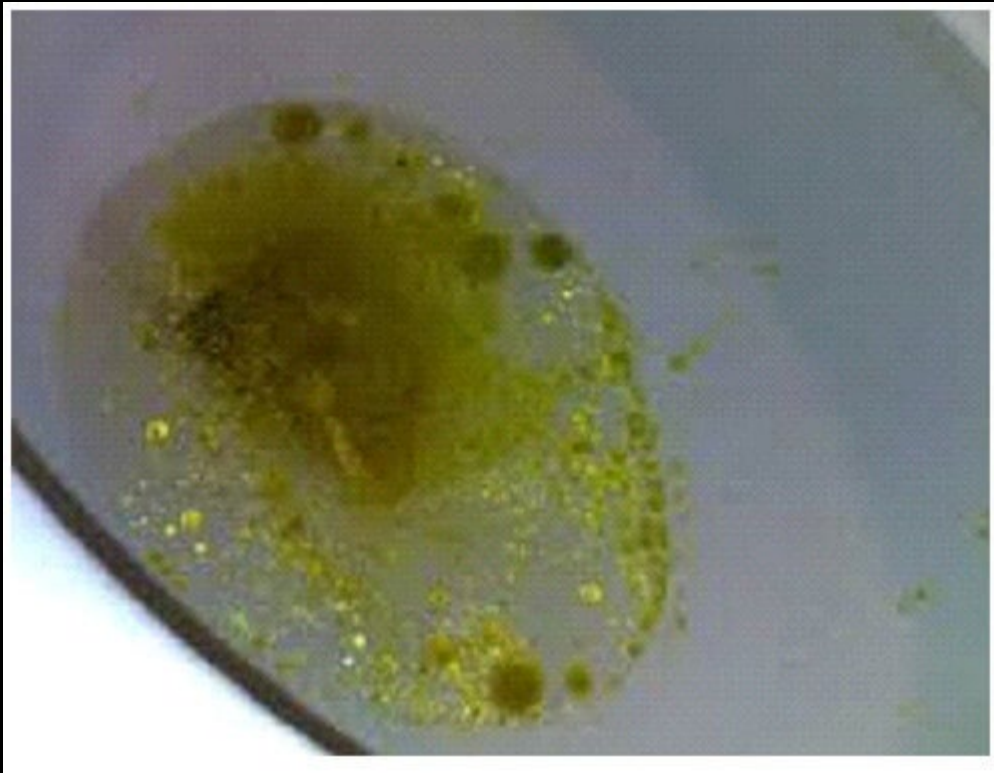


**End-to-side
pancreaticojejunostomy**

Pankreas kirurgi

- Nedsat eksokrin funktion
 - Whipple >60 %
 - halekirurgi: 10-20 %
 - Dårlig optagelse af fedt og fedtopløselige vitaminer





elastase

- Dårlig sammenhæng mellem elastase og fedt i afføringen hos NET patienter (Chaudhry et al)
- Elastase test er ikke perfekt hos NET patienter

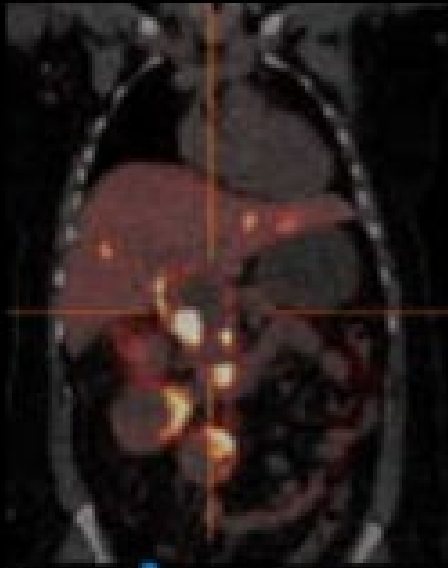
Fedt i afføring eller vægttab

- Start behandling med bugspytkirtelenzymer (Creon)
- Monitorer symptomer- kig i toilettet
- Hvis start dosis (50.000 IU x 3) ikke er nok – sæt dosis op.
- Op til 150.000 IU X 3



Carcinoid syndrom

- Tyndtarms NET producerer forskellige stoffer der kan give diarree (serotonin)
- Øger motilitet og sekretion
- Inaktiveres i lever og lunge



Coronal

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0



Sagittal

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0



Posterior

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

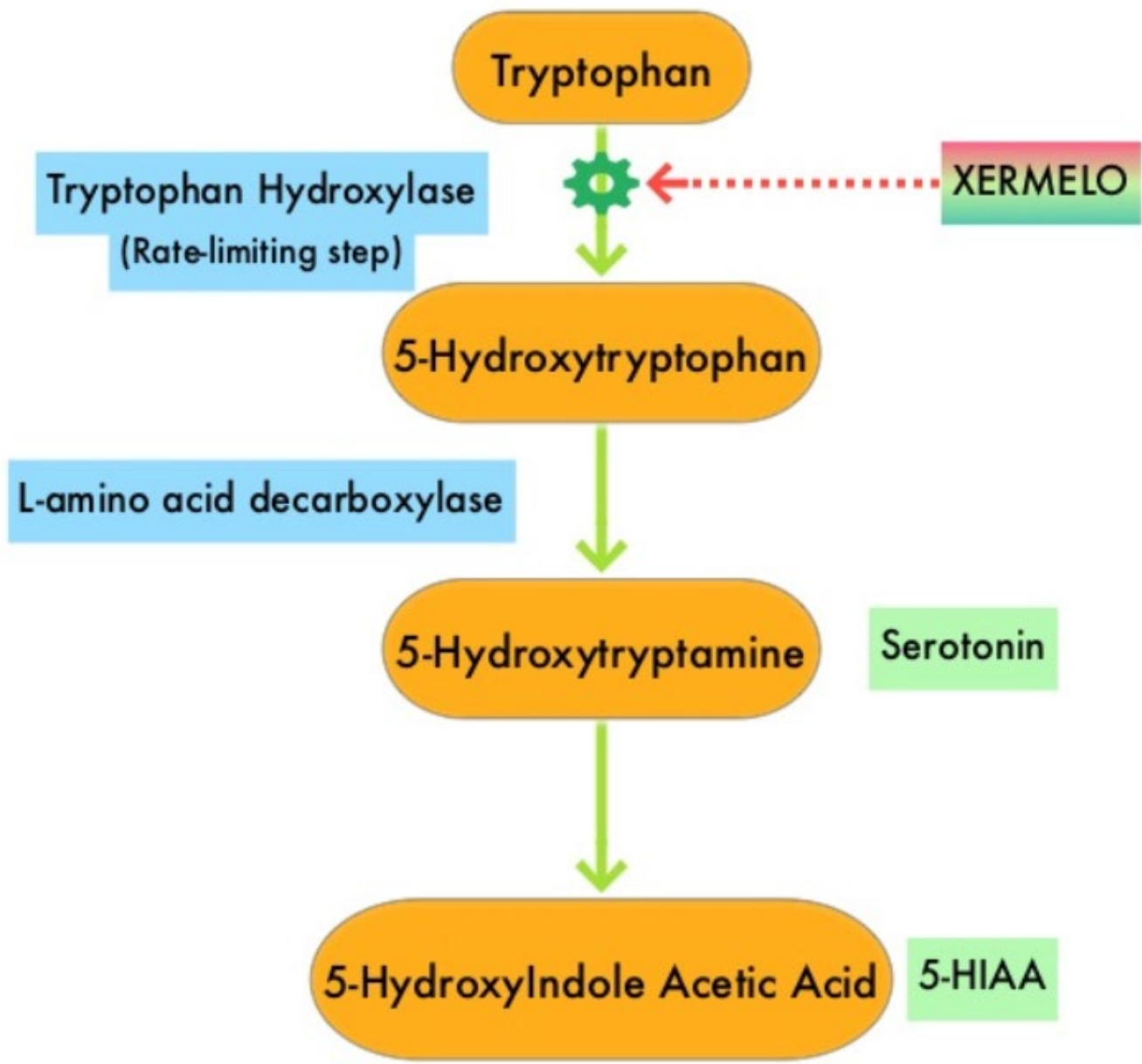
5-HIAA

- Nedbrydningsproduktet af serotonin
- Hvis sigifikant forhøjet:
 - SSA øg evt dosis til hver 21 el hver 14 dag.

Carcinoid syndrom

- Flushing, diarree, astma
- 50 % har forandringer i højre hjertehalvdel efter 2 år





1 SSA BLOCKS THE RELEASE

**OF SEROTONIN
OUTSIDE THE CELL⁶**

SSA

Serotonin

NET Cell

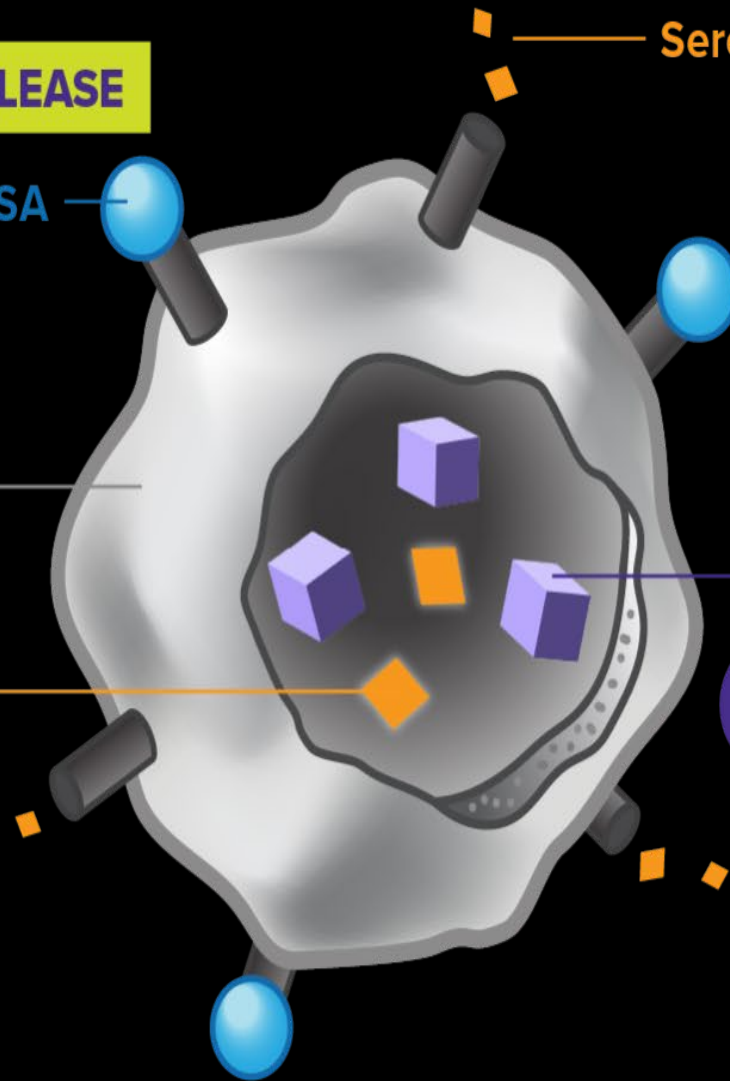
Serotonin

XERMELO

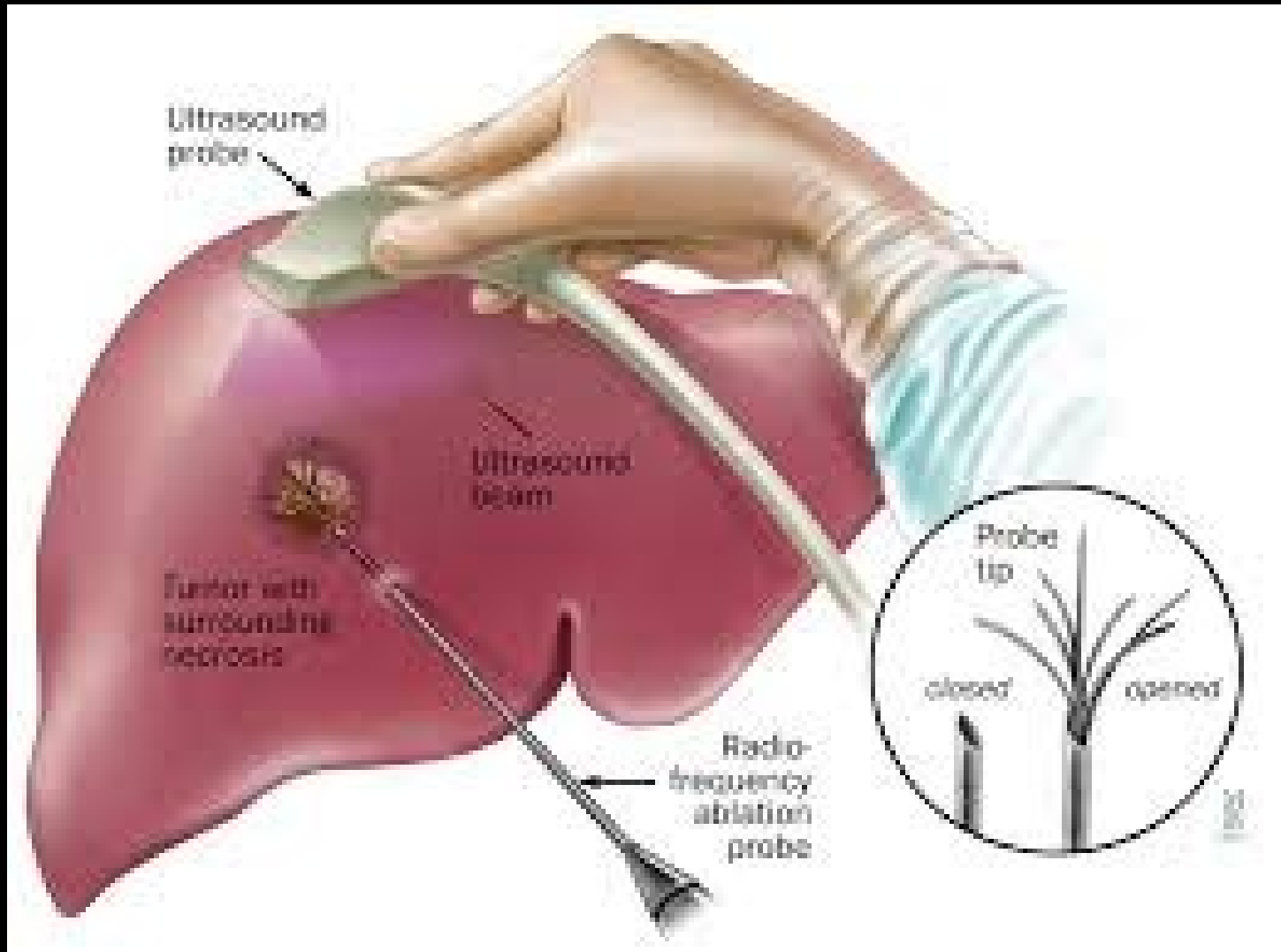
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**XERMELO INHIBITS
OVERPRODUCTION**

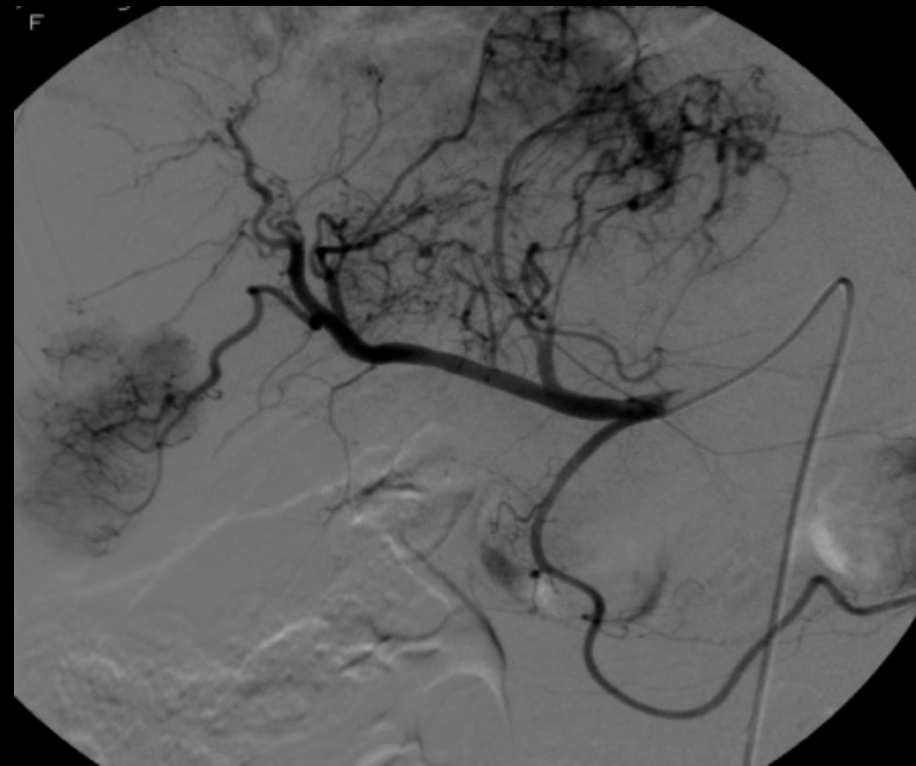
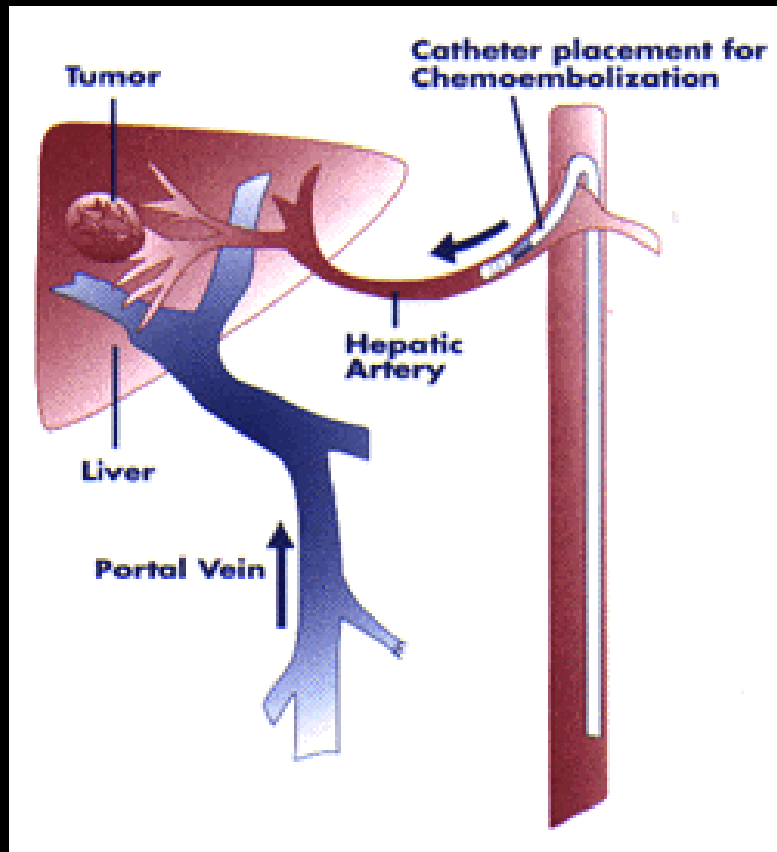
**OF SEROTONIN
INSIDE THE CELL^{3,10}**



RFA

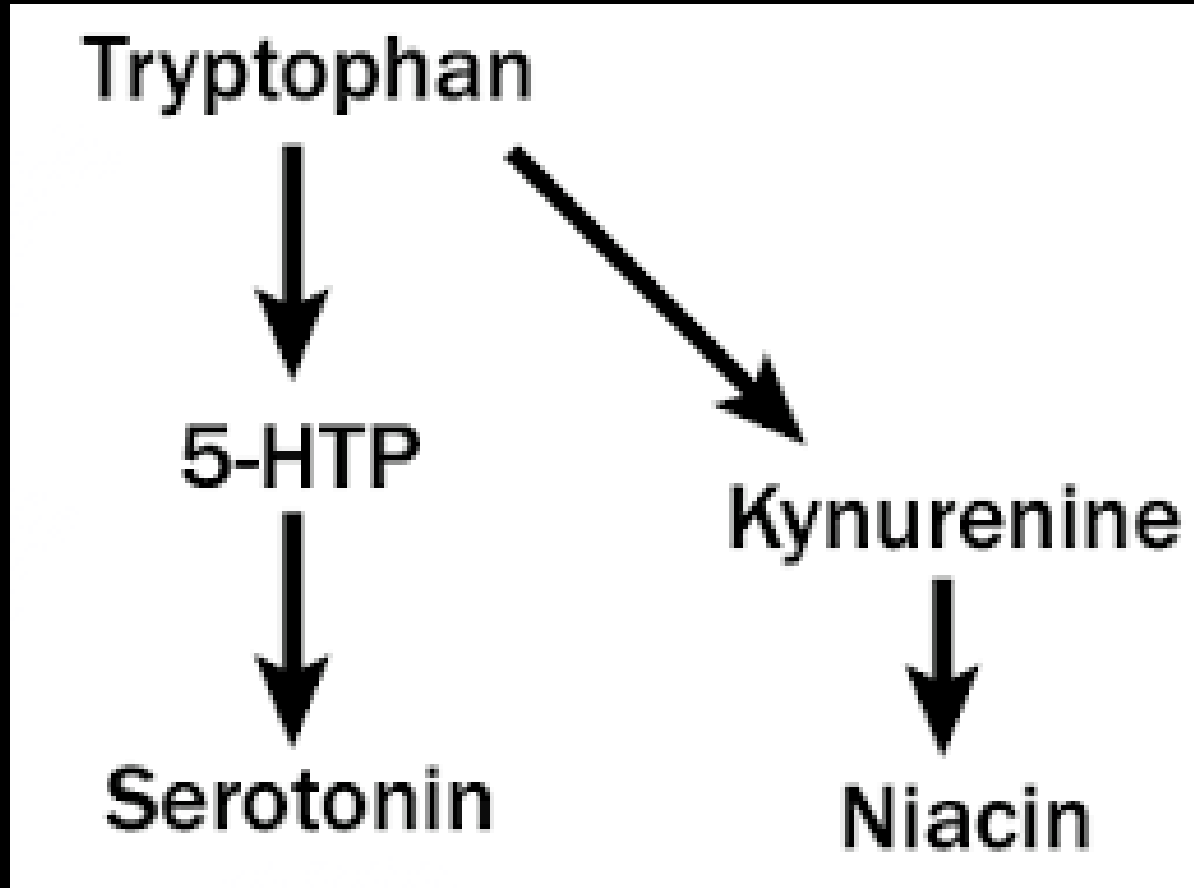


Embolisering ved carcinoide gener



Carcinoid syndrome

B3 vitamin (Niacin)



vitamin B3

- Et af 8 B vitaminer
- Bruges til fordøjelse , hud, nervesystem
- Pellagra:
 - hudforandringer
 - diarre
 - demens



Pragmatisk tilgang

- Niacin test er umuligt
- 40 % med carcinoid syndrome har mangel
 - 1 B-combin tablet indeholder 60 mg niacin.
 - 1 tablet/dag er dækkende



Diarre ved NET

- Bivirkning til kirurgi
- Bivirkning til behandling
- Hormonproduktion –carcinoid syndrom

