

Optometrist's Guide to Glaucoma Surgery

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1

I have no financial disclosures

2

Goals

How glaucoma surgery works

Who to refer / When to refer

Expected outcomes

3

Glaucoma Philosophy

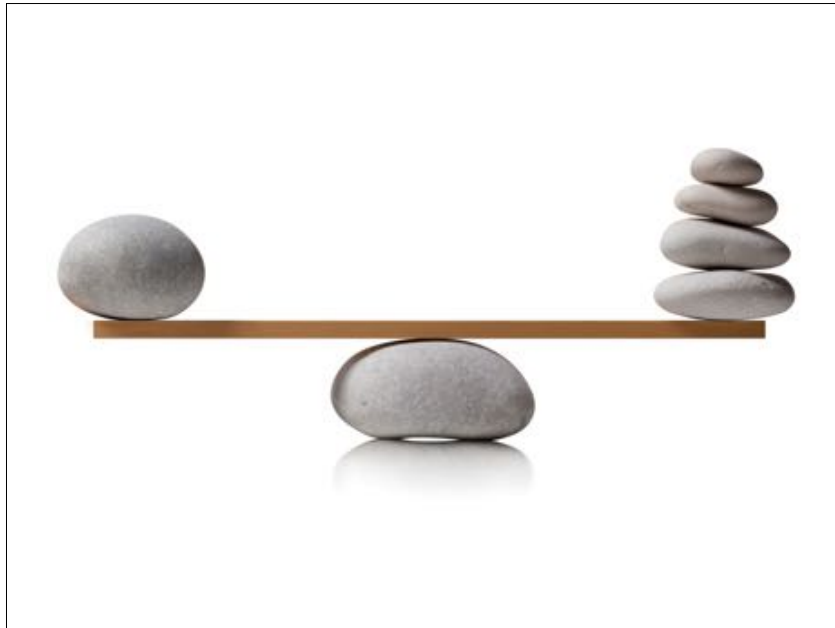
Glaucoma can be a visually debilitating disease.

Cannot be reversed.

My role is to maintain quality of life by:

Minimizing disease with least cost, burden, and side effects

4



5

CIGTS

Outcomes:

Surgery = Medicine

6

CIGTS

Complications:

Surgery >>> Medicine

7

TABLE 3. Intraoperative and Post-operative Complications After Trabeculectomy in 465 Eyes, n (%)

Complication	Intraoperative (n = 465)	Post-operative (n = 465)
Conjunctival buttonholes	5 (1.1)	0
Scleral flap problems	3 (0.7)	0
Partial severing of superior rectus tendon	1 (0.2)	0
Orbital bleeding	2 (0.4)	0
Anesthetic or systemic complications	1 (0.2)	0
Wound leak	1 (0.2)	26 (6)
Iris prolapse	1 (0.2)	5 (1.1)
Subconjunctival hemorrhage	2 (0.4)	0
Anterior chamber bleeding	37 (8)	48 (10)
Serous choroidal detachment	2 (0.4)	52 (11)
Suprachoroidal hemorrhage	0	3 (0.7)
Hypotony	0	4 (0.9)
Corneal epithelial defect	0	4 (0.9)
Monocular diplopia	0	1 (0.2)
Cystoid macular edema	0	1 (0.2)
Shallow or flat anterior chamber	0	62 (13)
Aqueous misdirection	0	2 (0.4)
New synechiae or adhesions	0	24 (5)
Encapsulated bleb	0	56 (12)
Dellen	0	18 (4)
Ptosis	0	55 (12)

8

Patient Selection

Progressive glaucoma despite medication

Cannot tolerate medication

Moderate/advanced disease

9

Patient Selection

Surgeon's role

Lower IOP

Minimize risk

10

Patient Selection

Optometrist's role

Help maintain visual function

Co-manage

11

Patient Selection

Surgery does NOT

Improve vision (not LASIK)

Cure glaucoma

12

Poor Candidates

Young

African American

Uveitic Glaucoma

Rubeotic Glaucoma

Prior failed glaucoma surgery

13

Poor Candidates



webeye.ophth.uiowa.edu

14

Good Candidates

Virgin eyes

Older

POAG

White

15

Define Success

IOP <18

IOP <21

No HVF or ONH progression

Additional Medication?

16

Trabeculectomy

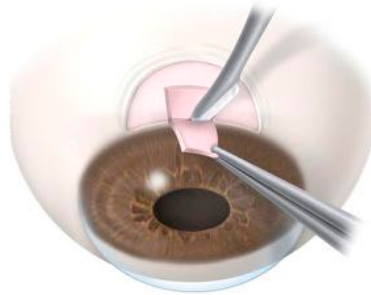
Conjunctival flap

Make scleral flap

Remove section of TM

Create Iridectomy*

Suture



17

Trabeculectomy

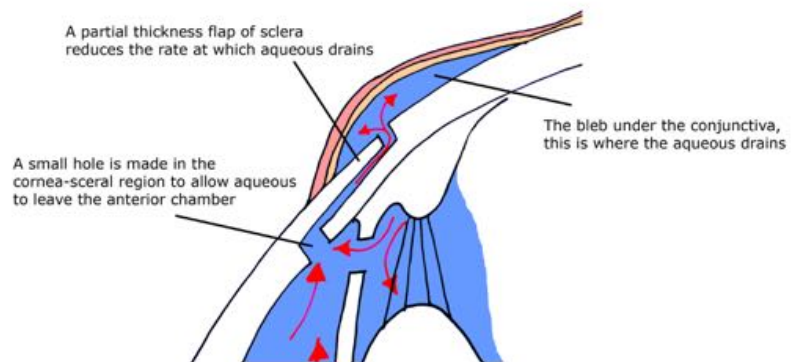
Goal

Create a non-healing fistula

Allow direct access from AC to subconj

Bypass TM and Schlemm's canal

18



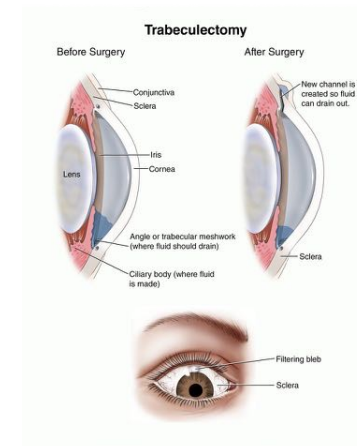
<http://www.ngsglaucoma.com/images/trab.jpg>

19

Remove TM

New passage

Filtering bleb



20

Bleb

Functional Bleb

Cystic

Diffuse

Good IOP

Non painful

21



22

Trabeculectomy

Improvements

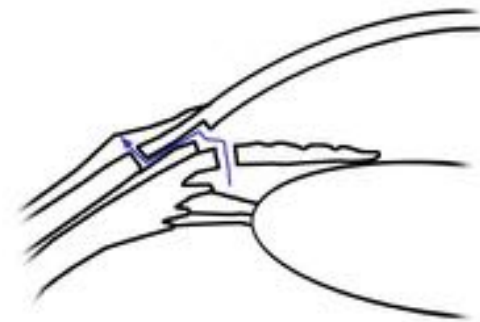
Guarded/Partial Thickness

Anti-metabolites

Suture Manipulation

23

Guarded



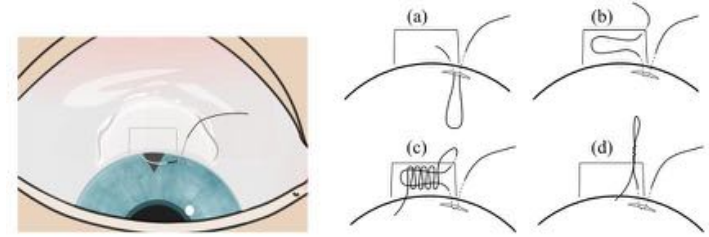
<http://emedicine.medscape.com/article/1844332-overview>

24

Antimetabolites

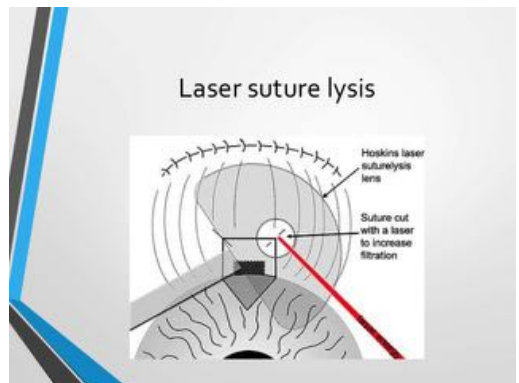
Mitomycin C
5 Fluorouracil (5 FU)

Suture Manipulation



http://www.glaucoma-surgery.org/trab_closing_one.html

Suture Manipulation

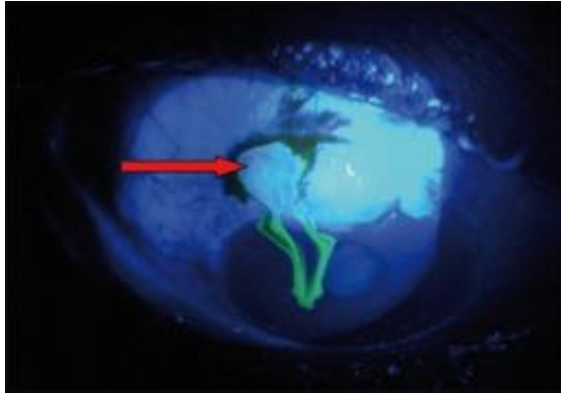


<https://es.slideshare.net/mobile/namratagupta96780/trabeculectomy-trabeculotomy-goniotomy-and-their-complications>

Bleb Complications

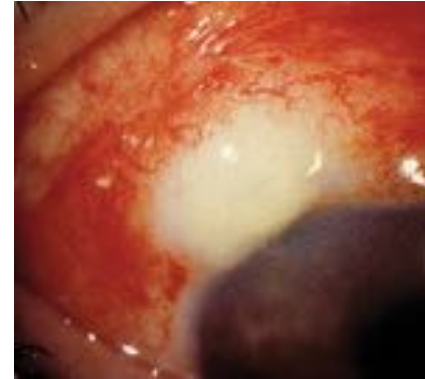
- Hypotony
- Leak
- Flat A/C
- Infection
- Pain

Wound Leak



29

Blebitis



<https://www.reviewofophthalmology.com/article/filtering-surgery-late-complications>

30

Complications

20 Year Follow Up

Complete Success

13% failure first year

1.6% per year after

Ophthalmology 2012;119:694-702

31

Complications

20 Year Follow Up

Qualified Success

7% failure first year

0.3% per year after

32

Complications

At 20 years 15% were blind

Other complications

Expulsive Hemorrhage

Phthisis

Endophthalmitis

33

Tube vs Trab

TVT study

Similar IOP post-op

Similar number post-op meds

Failure Trab (47%)**

Failure Tube (30%)

34

Tube vs Trab

TVT study

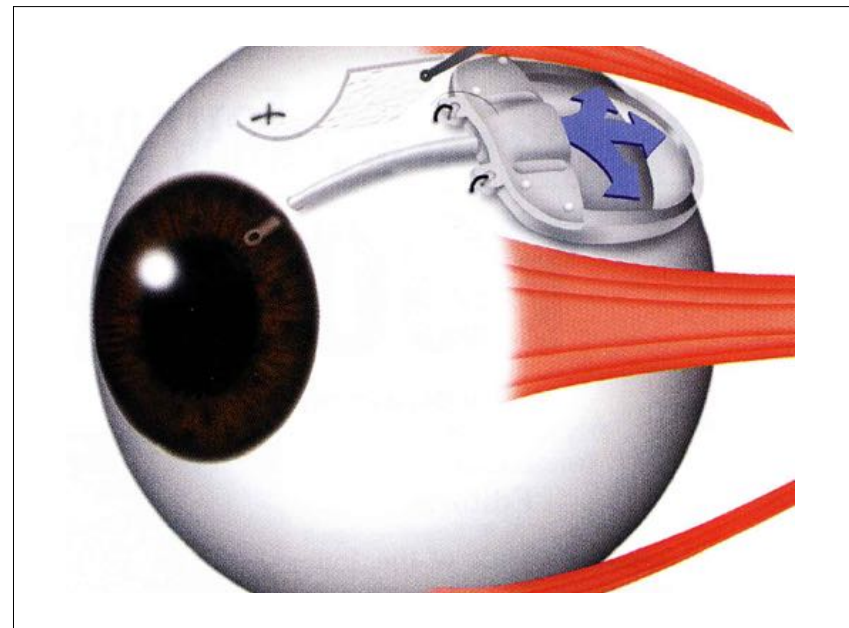
All eyes had prior surgery

2-% of patients lost 3 lines

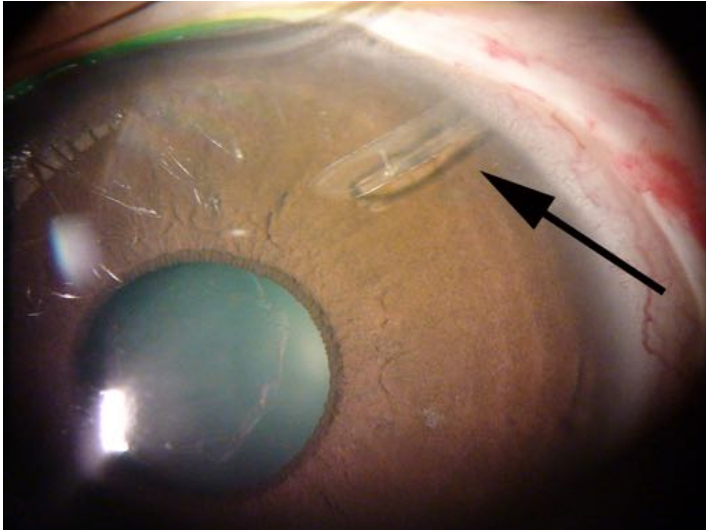
1% per year risk of endophthalmitis

Am J Ophthalmol. 2012 May;153(5):789-803.e2.

35



36



37

Ahmed



Baerveldt



38

Ahmed vs Baerveldt

Mean IOP

Ahmed - 16 mmHg

Baerveldt - 14 mmHg

Am J Ophthalmol. 2017 Apr;176:118-126

39

Ahmed vs Baerveldt

Post-Op Meds

Ahmed - 2

Baerveldt - 1

40

Ahmed vs Baerveldt

Failure

Ahmed - 51%

Baerveldt - 34%

41

Ahmed vs Baerveldt

Complications

Ahmed - 52%

Baerveldt - 62%

42

Ahmed

Baerveldt

Complications



Success

43

ExPRESS Mini-Shunt



<http://www.acvci.com/eyecare-services-list/glaucoma-care/glaucoma-surgery-express-mini-shunt/>

44

ExPRESS Mini-Shunt

Advantage

Lower rate of Hypotony

No Iridectomy

Standard trabecular opening

45

ExPRESS Mini-Shunt

Define "success"

3 Trials

No complications (i.e. Hypotony)

IOP 6-18 mmHg

IOP <21 mmHg with or without med

46

ExPRESS Mini-Shunt

Complications

Hypotonous maculopathy

ExPRESS - 4%

Trabeculectomy - 6%

47

ExPRESS Mini-Shunt

Success

IOP 6-18 mmHg

(Qualified success) - 54%

48

ExPRESS Mini-Shunt

Success

IOP <21 mmHg with or without meds

ExPRESS - 94%

1 / 4 were on meds

J Ophthalmol. 2015;2015:720109

49

MIGS

Microinvasive Glaucoma Surgery

iStent

Trabectome

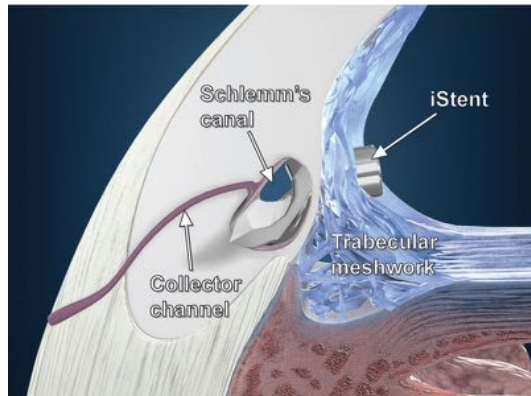
Cypass

Xen Gel Stent

Only FDA approved MIGS surgeries

50

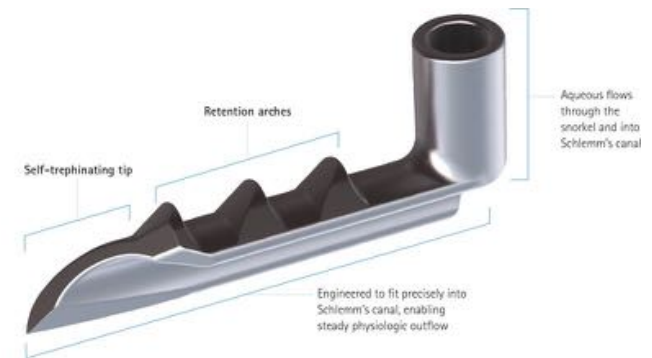
iStent



<http://www.drDylanJoseph.com/istent-exciting-technology-for-the-treatment-of-your-glaucoma/>

51

iStent



glaukos.com

52

Advantages

Minimally invasive

No cutting conjunctiva

Less risk (infection, hypotony)

Can perform trab or tube later

53

Disadvantages

Has to be combined with CE

Not for Advanced Glaucoma

Not for Secondary Glaucomas

54

Success

Reduce medication (1.6 to 0.4)

Reduce IOP (range 22% - 40%)

J Cataract Refract Surg. 2012; 38(8): 1339-1345.

55

Complication

Hyphema (transient) - 3-70%

Malposition - up to 16%

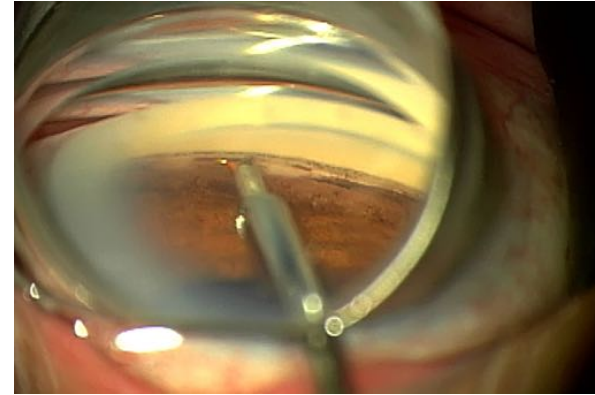
56



iStent Inject

57

Trabectome



<http://gusgazzard.com/trabectome/trabectome-ab-interno-surgery-condon/>

58

Trabectome

Advantages

Minimally invasive

No cutting conjunctiva

Less risk (infection, hypotony)

59

Disadvantages

Not for Advanced Glaucoma

Not for Secondary Glaucomas

Less effective if IOP is already low

60

Success

Reduce medication (1.2 to 0.4)

Reduce IOP (range 18% - 40%)

J Cataract Refract Surg; 34(7). 1096-1103.

61

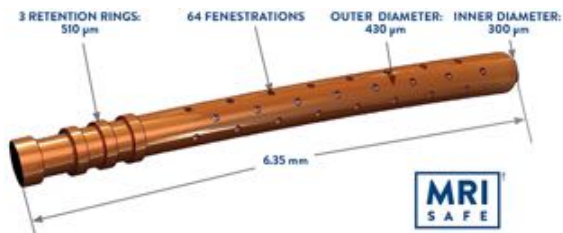
Complication

Hyphema (transient) - 60-78%

PAS - up to 25%

62

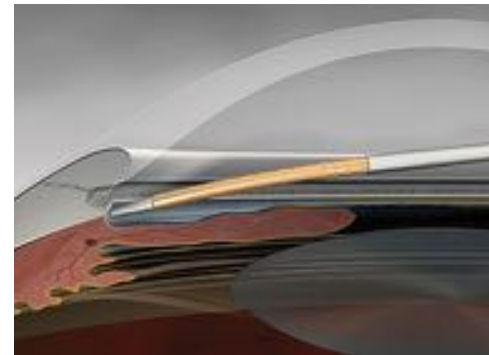
CyPass Micro-Stent



<https://www.myalconstore.com/glaucoma-surgery/cypass-micro-stent/>

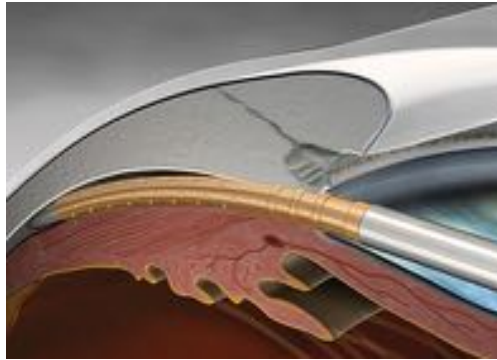
63

CyPass



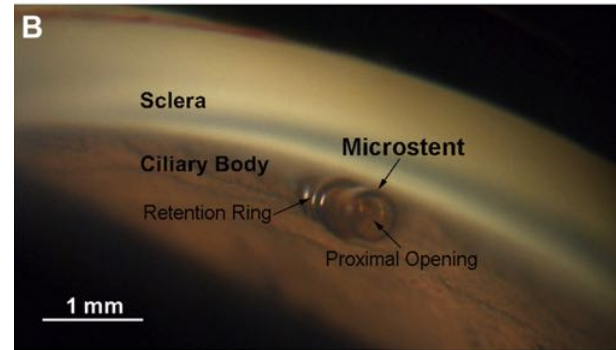
<https://www.myalconstore.com/glaucoma-surgery/cypass-micro-stent/>

64



<https://www.myalconstore.com/glaucoma-surgery/cypass-micro-stent/>

65



Ophthalmology 2016;123:2103- 2112

66

CyPass - COMPASS Trial

Success

IOP reduction 20% at 2 years

77% CyPass

60% CE

Ophthalmology 2016;123:2103- 2112

67

Success

IOP between 6-18

65% CyPass

44% CE

68

Success

Average number of meds

CyPass 1.4 pre-op -> 0.2

CE 1.3 pre-op -> 0.7

69

Complication

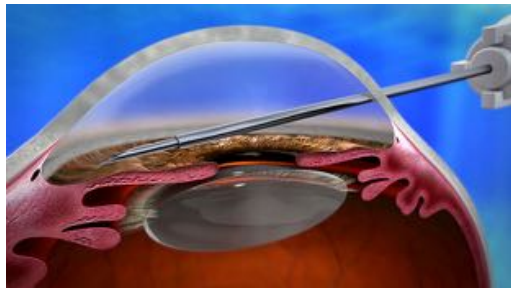
Iritis - 9%

Hyphema (transient) - 3%

(IOP < 6%) - 3%

70

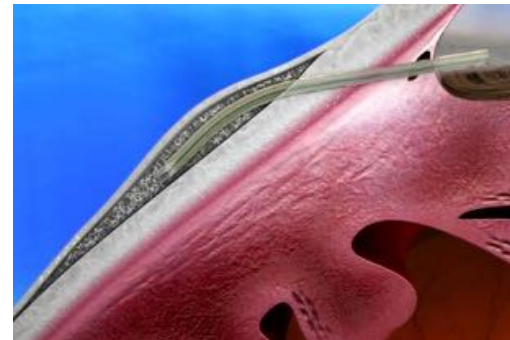
XEN 45 Gel Stent (Ab-Internio)



MIGS.org

71

XEN 45 Gel Stent



MIGS.org

72

XEN - 12 month Trial

65 patients

75% had $\geq 20\%$ reduction in IOP

Avg reduction 9 mmHg

Meds decreased from 3.5 to 1.7

Ophthalmology 2016;123:2103- 2112

73

MIGS

Pros

Minimally invasive

Good results

74

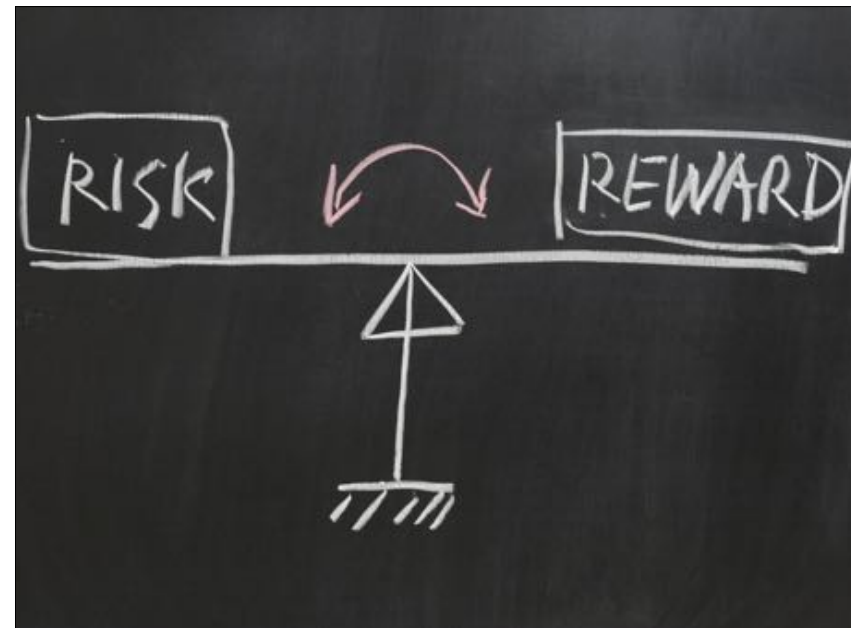
MIGS

Cons

Currently combined with CE

Select group benefits

75



76

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