I Can’t Get No (Evidence-Based) Satisfaction

Practical Implementation of the AOA Clinical Practice Guidelines for Patients with Diabetes

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Disclosures:
Dr. Karpecki has been on advisory boards or spoken on behalf of AMO, Allergan, Akorn, Arctic Dx, Bauch & Lomb, Bruder Health Care, CooperVision, Ocusoft, Essilor, Focus Labs, Freedom-Meditech, Icare USA, J&J, Jobson, Marco, Oculus, Odyssey, OM Solutions, Regeneron, Shire Pharma, Science Based Health, TearLab, Topcon, Vmax, Zeiss.

Dr. Chous has been on advisory boards or spoken on behalf of Bausch & Lomb, dLife, Freedom-Meditech, Genentech, Glaxo-SmithKline, Jobson, Kowa, Ocular Nutrition Society, Optos, Regeneron, Risk Medical Solutions, VSP, ZeaVision.

What Is Evidence-Based Practice?

- Decision making using the best clinical research evidence available, in conjunction with clinical experience & patient preferences.

- Takes into account the risks & benefits of clinical decisions.
Skeptical Interlocutor:

Aren’t We Already Doing This??

Skept Cat

demands proof.

The Problem

- The appropriate application of evidence in practice occurs only 54% of the time
  - 12 cities, 439 measures for 30 diseases
- On average, it takes 17 years for new clinical recommendations to be widely implemented for patient benefit
  Balas EA. National Committee for Quality Health Care; January 27-28, 2003; Washington DC
What Are Evidence-Based Guidelines?
- Public documents covering recognized diagnoses & reimbursable examinations and procedures for health care specialties
- Serve as professional liaison documents for interfacing with other specialties, professions and regulatory bodies
- Typically follow recommendations for guideline development advocated by the US Institute of Medicine (IOM)
IOM Recommendations

- Process
- Disclosures
- Stakeholders

Evidence Based Optometry Committee
Adopted 14 Steps to Develop CPGs

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ACO's 14 Steps to Evidence-Based Clinical Practice Guideline Development

1. Establish Development Group: Pull together a multidisciplinary panel of experts, including patient and public representatives, to develop guidance (CPG).
2. Formulate Questions: Manage conflict of interest (COI)
3. Clinical Development: Experts and define all clinical questions through a Question Formulation Meeting and define search criteria (CRD).
4. Search for Evidence: Search for evidence, develop criteria to search for this evidence (CRD).
5. Evaluate Evidence and Clinical Recommendations: Find and grade papers (CRD). Readers are given a summary of the evidence and a grade for each paper and grade the strength of each (CRD).
6. Adjudicate Clinical Recommendations: Review all clinical recommendations and articulate each for inclusion in the guideline during an "Adjudication of Recommendations" meeting and document individual gaps in medical evidence (CRD).
7. Write Draft: Send to writer for development of draft.
8. Draft (Final Draft): Send for revision/feedback/revisions for draft 2, then final reading / approval/revision as necessary.
9. Approved for Draft Approval: Send to the ACO Board of Trustees for approval to post for peer and public review. Post on the ACO website, announce the review period, and solicit comments/feedback.
10. Final Comment Period: Follow IOM's final comment period process and submit final document to IOM for approval and finalization of CPG.

Purpose of Evidence-Based Guidelines

- Provide practitioners a clear explanation of the logical relationship between alternative care options and health outcomes
  - EXAMPLE: Does laser or anti-VEGF therapy result in better visual outcomes for diabetic macular edema?
- Based on a systematic review of the existing evidence (reading lots of papers)
  - BUT...not all evidence is created equal
Purpose of Evidence-Based Guidelines

- Grades both the strength of the evidence and the strength of clinical recommendations derived from that evidence
- A, B, C, D
- EXAMPLE: Patients with center-involved DME should be referred for treatment with laser photocoagulation and/or anti-VEGF therapy (Evidence Grade A, Clinical Recommendation Grade A)
Lots of Hard Work by Great People

- Developed by a knowledgeable, multi-disciplinary panel of experts & key stakeholders
  - 12 optometrists (11 voting members)
  - 1 retinal specialist
  - 1 endocrinologist
  - 1 public member with diabetes
  - 2 research bibliographers, a medical writer, and wonderful & dedicated AOA staff

Other Considerations per IOM...

- Based on a transparent process that minimizes conflicts of interest and bias
- Revision every 2-6 years depending on changes to the evidence base
- Management of controversy through 'enlightened democracy' – for example:
  - 2 readers for every paper – a 3rd reader if substantial disagreement
  - Final grading voted on by the entire EBO Committee
What's Best for CSME?

ACTION: Patients with diabetic macular edema (DME), but without clinically significant macular edema (CSME), should be re-examined at 4- to 6-month intervals. Once clinically significant macular edema develops, treatment with focal laser photocoagulation or intravitreal anti-VEGF injection is indicated.175 (Evidence Strength: A, Recommendation: A)

Goals of EBO Guidelines for DM

- Help ODs identify patients at risk for both diabetes & diabetes-related vision loss
- Help doctors save vision by aiding in timely detection, intervention and referral for treatment
- Help educate patients and other HCPs about ocular complications of diabetes
- Help educate patients about the importance of good diabetes self-management and treatment options
Key Features of the DM Guidelines

- Grading of evidence and clinical recommendations
- Clinical "Action Items" are highlighted in Action Boxes

**ACTION:** Individuals with diabetic macular edema (DME), but without clinically significant macular edema (CSME), should be re-examined at 4- to 6-month intervals. Once CSME develops, treatment with focal laser photocoagulation or intravitreal anti-VEGF injection is indicated.178 [Evidence Strength: A, Recommendation: A]

- Replete with helpful figures, tables and references

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**TABLE 2**

<table>
<thead>
<tr>
<th>Diabetes Mellitus and Presence of Diabetic Retinopathy and Diabetic Macular Edema</th>
<th>Duration of Disease</th>
<th>Diabetic Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type 1</strong></td>
<td>&gt; 5 years</td>
<td>17 to 20% have some retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 years</td>
<td>40% have some retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 15 years</td>
<td>18 to 20% have some degree of retinopathy; 25% progress to proliferative diabetic retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 20 years</td>
<td>80 to 60% progress to proliferative retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 25 years</td>
<td>29% have diabetic macular edema; 17% have clinically significant macular edema</td>
</tr>
<tr>
<td><strong>Type 2</strong></td>
<td>All ages</td>
<td>20 to 30% have some retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 4 years</td>
<td>4% progress to proliferative retinopathy</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 years</td>
<td>29% of individuals on insulin have diabetic macular edema; 14% on oral medications have diabetic macular edema</td>
</tr>
<tr>
<td></td>
<td>&gt; 15 years</td>
<td>60 to 80% have some retinopathy; up to 20% progress to proliferative retinopathy</td>
</tr>
</tbody>
</table>

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**TABLE 3**

<table>
<thead>
<tr>
<th>Diabetes Medication Class</th>
<th>Examples</th>
<th>Hypoglycemic potential (Used alone)</th>
<th>Injectable</th>
<th>HbA1C Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insulins</strong></td>
<td>Mewopranol</td>
<td>Yes</td>
<td>No</td>
<td>1.6-2.5%</td>
</tr>
<tr>
<td></td>
<td>Glipizide</td>
<td>Yes</td>
<td>No</td>
<td>1.5-2.5%</td>
</tr>
<tr>
<td></td>
<td>GlyBuride</td>
<td>Yes</td>
<td>No</td>
<td>1.5-2.5%</td>
</tr>
<tr>
<td></td>
<td>Metformin</td>
<td>Yes</td>
<td>No</td>
<td>1.5-2.5%</td>
</tr>
<tr>
<td><strong>Alpha-glucosidase inhibitors</strong></td>
<td>Acarbose</td>
<td>No</td>
<td>No</td>
<td>0.9-1.1%</td>
</tr>
<tr>
<td></td>
<td>Miglitol</td>
<td>No</td>
<td>No</td>
<td>0.8-1.8%</td>
</tr>
<tr>
<td><strong>Thiazolidinediones</strong></td>
<td>Rosiglitazone</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td></td>
<td>Pioglitazone</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td><strong>DPP-IV inhibitors</strong></td>
<td>Sitagliptin</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td></td>
<td>Linagliptin</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td><strong>SGLT-2 inhibitors</strong></td>
<td>Canagliflozin</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td></td>
<td>Empagliflozin</td>
<td>No</td>
<td>No</td>
<td>0.8-1.6%</td>
</tr>
<tr>
<td><strong>GLP-1 receptor agonists</strong></td>
<td>Liraglutide</td>
<td>Yes</td>
<td>Yes</td>
<td>0.8-1.2%</td>
</tr>
<tr>
<td><strong>Meglitinides</strong></td>
<td>Glimepiride</td>
<td>Yes</td>
<td>Yes</td>
<td>0.8-1.2%</td>
</tr>
<tr>
<td><strong>Dipeptidyl peptidase-IV inhibitors</strong></td>
<td>DPP-4 inhibitors</td>
<td>Yes</td>
<td>Yes</td>
<td>0.8-1.2%</td>
</tr>
</tbody>
</table>

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Why Don’t Doctors Adhere to Evidence-Based Practice Guidelines?

- Independence
  - Docs want autonomy – resist being told how to practice

- Exceptionalism
  - Docs want to go above & beyond today’s generally accepted evidence

- Organizational obstacles/patient compliance

Implement Sci. 2009 Aug 12:4-54.

Exceptionalism

- Someone’s expert opinion (or hunch) is always right or better years/decades before the evidence proves it!
- The evidence base is perceived as synonymous with ‘ordinary care’
- Good clinicians typically want to give their patients EXTRA-Ordinary care

Why Don’t Doctors Adhere to Evidence-Based Practice Guidelines?

- Lack of familiarity with guidelines
- Ambiguity in application of guidelines for specific patients
- Lack of agreement with recommendations

Implement Sci. 2009 Aug 12:4-54.
Are EB Guidelines “Standards of Care”?

- Not technically, but could be used against providers in a court of law….BUT

- In only 7% of US malpractice cases have guidelines been referenced

- In only 3% have guidelines been used by claimant attorneys against providers

AMA J Ethics 2011; 13(1):36-41

Practical Considerations

- We think ODs must “see” their patients and professional expertise within the guidelines

- Pedagogy of the Oppressed: Practitioners are increasingly overwhelmed by the challenges of delivering & getting paid fairly for our services

- These EBO Guidelines are designed to support optometrists on the front lines
Paul & Paul Are Here
To Liberate You From
Evidence-Based
Oppression

It’s NOT THIS Venn Diagram Either....

Best
External
Evidence

Individual
Clinical
Expertise

Patient
Values &
Expectations

A Few Good Cases
Case Example

IMPLEMENTING EVIDENCE BASED CLINICAL PRACTICE GUIDELINES FOR THE EYE CARE OF PATIENTS WITH DIABETES MELLITUS

Relevant Action Items

- **Action Item**: Patients should be questioned about awareness of their personal diabetes ABCs (A1c, blood pressure, cholesterol, smoking status)

- **Action Item**: Retinal examinations for diabetic retinopathy should be performed through a dilated pupil

Relevant Action Items

- **Action Item**: The individual's primary care physician should be informed of eye examination results following each examination, even when retinopathy is minimal or not present

- **Action Item**: As diabetes may go undiagnosed for many years, any individual with type 2 diabetes should have a comprehensive dilated eye examination soon after the diagnosis of diabetes
Patient JTM

54 yo male diagnosed x 1 month with T2DM

Case History

• Q - Do you know what your latest A1c test result is? That's the test that measures your average blood sugar levels over the last 3 months and predicts your likelihood of developing diabetes complications, especially those affecting your eye health

Sidebar - Important Note About A1c

• Action ITEM: The glycemic goal for persons with diabetes should be individualized, taking into consideration the risk of hypoglycemia, anticipated life expectancy, duration of disease and comorbid conditions
  • Low A1c increases risk of death in some older pts with CVD, and children
  • An 85 yo with no DR does not need an A1c < 6.5%
  • COMMUNICATE with the PCP/Endo about glycemic targets

Patient JTM

54 yo male diagnosed x 1 month with T2DM

Case History

• Q – Do you know what blood pressure your primary care doctor/endocrinologist has recommended for you. It's important because high blood pressure damages the eyes in people with diabetes more than people without diabetes
Patient JTM

- 54 yo male diagnosed x 1 month with T2DM

Case History
- Q – Do you know what your blood cholesterol levels are, especially your levels of good and bad cholesterol? It’s important because these levels affect your risk of eye and heart disease.

Patient JTM

- 54 yo male diagnosed x 1 month with T2DM

Case History
- Q – Do you smoke cigarettes or use tobacco? It’s important because tobacco use increases the risk of eye complications from diabetes.
  - IF YES – Do you want to quit?

Related Action Item

- Individuals should be advised of the risks of smoking related to diabetes and encouraged to quit smoking and/or seek smoking cessation assistance.
Patient JTM – Ocular examination

- Perform a dilated retinal examination with stereoscopic assessment of the disk and macula

- OD – Many people have diabetes for several years before they are diagnosed, so we are going to dilate, or enlarge your pupils to thoroughly check for changes to the tiny blood vessels inside your eyes and I will send a report of my findings to your PCP and endocrinologist.

Retinal Imaging is

- Wonderful and extremely useful

- BUT

- Does not substitute for clinical examination, especially in a court of law.....

Send a Diabetes Eye Examination Report

Available at www.aoa.org/diabetes
Patient JTM -

- You notice your patient seems to be ‘spacing out’ during your examination or consult.

- You check the chart to determine if he is taking any diabetes medications that can cause hypoglycemia, especially insulin or a sulfonylurea drug like Glyburide, Amaryl® or Micronase®

- JTM has started insulin therapy – rapid-acting Novolog® and the basal insulin, Levemir®

Patient JTM

- You ask JTM if he feels weak or shaky, and if he has his blood glucose meter with him
  - JTM self tests and his spot glucose is 54 mg/dl
  - or
  - JTM has no meter, so you test with the office meter you wisely purchased for such a common event & find his spot glucose is 54 mg/dl
  - or
  - You assume JTM is hypoglycemic based on his Sx and then you.....
Action Item

- Optometrists should have a rapid-acting carbohydrate (glucose gel or tablets, sugar-sweetened beverage or fruit juice) in their offices for use with diabetes patients who experience acute hypoglycemia during an eye examination.
Hypoglycemia

• Always have a rapid-acting carbohydrate in the office (juice, sugared soda, glucose gel) for pts on meds that can cause low blood glucose....

15gm CHO will ↑BG ~ 30-40 mg/dl (1.7-2.2 mmol/L)

Case 2: Patient DKS

- T2DM x 20 years
- Last A1c was 10%
- BCVA = 20/200 OD/OS
- Discontinued metformin B/C it upset her stomach
- Ant Seg exam shows 2+ NS
- Dilated exam shows.....

Severe NPDR
CSME/Center-Involved DME
Action Item

ACTION: The current standard of care for treatment of center-involved diabetic macular edema (DME) in persons with best corrected visual acuity of 20/32 or worse, is anti-VEGF injections. [Evidence Strength: A, Recommendation: A]

Action Item

ACTION: Persons should be educated about the ocular signs and symptoms of diabetic retinopathy and other non-retinal complications of diabetes, and encouraged to comply with recommendations for follow-up eye examinations and care.
Other Relevant Action Items
- Refer to retina specialist for Tx
- Refer to the Endocrinologist, PCP and Pharmacist to discuss medications
- **Action Item:** As part of the proper management of diabetes, the optometrist should make referrals for concurrent care when indicated

PPOD – We Are The “O”!!!
- Patients with diabetes and DR often have comorbid conditions, including podiatric and dental complications
- Establish an array of HCPs in your community to help you better care for your patients with diabetes

Patient DKS - Outcome
- Avastin x 8; Lucentis x 5; IVTA x 3
- CRT decreased 250 microns, BCVA now 20/100 OD/OS
- Steroid-induced glaucoma & 4+ PSC s/p combined cataract/trabeculectomy Sx
- Anything Else We Should Do?
Action Item

- **ACTION:** Individuals who experience vision loss from diabetes should be provided, or referred for, a comprehensive examination of their visual impairment by a practitioner trained or experienced in vision rehabilitation.

Patient KG

- 44 yo male with T1DM x 22 years
- Last HbA1c = 11.6%
- In-office BP = 126/78
- Meds: Lantus®, Novolog®
- BCVA is 20/30 OD and 20/100 OS
- 1+ PSC OD/OS No NVI seen
- IOP = 17/18
- "I am seeing lines in my vision the last week"
- "I got a shot in my right eye last year and had to pay $900 (high-deductible insurance), so never went back"
What’s The Diagnosis?

- May be more than one answer
  - Mild NPDR
  - Moderate NPDR
  - Severe NPDR
  - PDR
  - High-Risk PDR
  - Traction Retinal Detachment
  - DME
  - CSME (Not enough information; To be sure)

Proper Management?

- Take Photos and Monitor x 1 month
- Referral to Ophthalmology
- Prompt Referral to a Vitreo-retinal surgeon
- Stat referral to an ophthalmologist experienced in the management of diabetic retinal disease
- Stat referral to the endocrinologist or PCP for better glucose control
Relevant CPG Action Items

- Patients with high-risk proliferative diabetic retinopathy (PDR) should receive referral to an ophthalmologist experienced in the management of diabetic retinal disease for prompt pan-retinal photocoagulation

- Prompt referral to a vitreo-retinal surgeon is indicated when a vitreous hemorrhage, a retinal detachment or other evidence of PDR is present

Relevant CPG Action Items

- The individual’s primary care physician should be informed of eye examination results following each examination, even when retinopathy is minimal or not present

- As part of the proper management of diabetes, the optometrist should make referrals for concurrent care when indicated

Outcome for KG

- PRP performed OU by retinal specialist
- A1c improved to 8% under endocrinologists’ care (target = 7.5 - 8%)
- Vitrectomy performed for vitreo-macular traction (VMT) OD and traction retinal detachment (TRD) OS
- Cataract surgery performed OU
  - BCVA 20/80 and 20/1000
  - KG referred to vision low vision specialist
- Diagnosed with autonomic cardiomyopathy
More Relevant Action Items

- The glycemic goal for persons with diabetes should be individualized, taking into consideration their risk of hypoglycemia, anticipated life expectancy, duration of disease and comorbid conditions.

- Individuals who experience vision loss from diabetes should be provided or referred for a comprehensive examination by a practitioner trained/experienced in vision rehabilitation.

<table>
<thead>
<tr>
<th>Patient attitude and expected treatment efforts</th>
<th>More stringent</th>
<th>Less stringent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High motivation, stamina</td>
<td>Less motivated, non-compliance</td>
<td>Poor self-care capacity</td>
</tr>
<tr>
<td>Risk potentially associated with hypoglycemia, other complications</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Disease duration</td>
<td>Early diagnosis</td>
<td>Late onset</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td>Important comorbidities</td>
<td>Absent</td>
<td>Few/mild</td>
</tr>
<tr>
<td>Established vascular complications</td>
<td>Absent</td>
<td>Few/mild</td>
</tr>
<tr>
<td>Resources, support system</td>
<td>Adequate</td>
<td>Limited</td>
</tr>
</tbody>
</table>

Individualized A1c Goals per ADA and EASD

Summary of the CPG Action Items

- See pages 78-80 of the CPG


OR

http://www.aoa.org/diabetes
Some Pitfalls of EB Health Care

Epistemological Problems:
- Few RCTs and no meta-analysis proves adherence to EB guidelines is better than usual care
- However – ‘Outcomes analysis’ for things like asthma hospitalization and CVD management do show better results at lower cost with EB practice

Problems with RCTs/Meta-analysis
- Study inclusion criteria
- 29-50% of RCTs showing negative results are never published per some reports
- Weighted averaging may obscure strong dose-response effects
- The universe of variables is infinite for most any scientific question
- We don’t need an RCT to establish the efficacy of every possible action

Parachute Use to Prevent Death and Major Trauma Related to Gravitational Challenge: Systematic Review of Randomized Controlled Trials

Objectives
- To determine whether parachutes are effective in preventing major trauma related to gravitational challenge

Results
- We were unable to identify any randomized controlled trials of parachute intervention

Conclusions
- As with many interventions intended to prevent ill health, the effectiveness of parachutes has not been subjected to rigorous evaluation by using randomized controlled trials. Advocates of evidence-based medicine have criticized the selection of interventions evaluated by using only observational data.
- We think that everyone might benefit if the most radical protagonists of evidence-based medicine organized and participated in a double-blind, randomized, placebo-controlled, crossover trial of the parachute.
The Conceit of EBM

“The refusal to give due weight to accumulated professional wisdom is a peculiarly Western scientific version of historical nihilism, and an unattractive quality of EBM. The advice to “burn your traditional textbooks” belittles the efforts and achievements of our predecessors...This assumption of professional ignorance forms the fundamental basis for applying RCT’s in all areas of medicine.”

Fairley JW. Evidence based medicine -- historical perspective and critique. 2007

The Hidden Scale under the EBM Triad

The Reality....
Prevention is King
- Prevention applies to everyone
- Prevention of diabetes is the KEY to preventing vision loss from diabetes
- The EBO CPGs for diabetes do not consider prevention of diabetes

Practical Tips To Avoid Diabetes
- Exercise 30 minutes each day (soon after waking)
- Eat a low GI Mediterranean type diet
- Eat breakfast
- Eat a variety of fruits and vegetables and more vegetables
- Minimize processed meats
- Drink coffee or tea
- Sleep > 6 hours but < 9 hours per night
- Get your serum vitamin D > 40 ng/ml
- Breast feed
  * Turn down the thermostat
  * Live away from smog

Why We SHOULD Be Familiar With EB Guidelines
- They are a GREAT starting point for disease management
Why We SHOULD Be Familiar With EB Guidelines

- The diabetes CPGs are relatively straightforward and jibe well with optometric education & common clinical practice

Why We SHOULD Be Familiar With EB Guidelines

- Adherence does NOT exclude complementary alternative therapies or adoption of strategies based on our new evidence, including individual experience and analysis of the emerging literature

Examples

- DRCR.net Protocol T shows Eylea results in an additional line of VA compared to Lucentis or Avastin for pts worse than 20/50 and DME at 1 year
  

- Primarily peripheral DR lesions elevate risk of significant worsening of DR by 3-5 fold
  
  Ophthalmology. 2015 Feb 19

- Fenofibrate significantly lowers the risk of DR progression in T2DM per multiple RCTs
  
  Ophthalmology. 2014 Dec;121(12):2295-6
None of this (Emerging) Evidence Made it into the Diabetes CPGs

- Published after CPGs for diabetes went to press and/or
- The question was not posed at the original articulation meeting and/or
- The relevant papers may not have been detected by the search

It’s the Mark of ANY Learned Professional to Be Skeptical of Externally Imposed Dictates

It is also the duty of EVERY learned professional to keep abreast of the best scientific evidence that may benefit her/his patients

Are We Satisfied Yet?

- Alas….
- Evidence-Based Satisfaction is an illusion
- And that's OK
Thank You

PAUL M. KARPECKI
A. PAUL CHOUS