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**SOCIETY OF ACTUARIES**  
**Group and Health – Advanced**

# Exam GHADV

## MORNING SESSION

**Date:** Thursday, May 5, 2016

**Time:** 8:30 a.m. – 11:45 a.m.

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### INSTRUCTIONS TO CANDIDATES

#### General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
  - a) The morning session consists of 8 questions numbered 1 through 8.
  - b) The afternoon session consists of 4 questions numbered 9 through 12.

The points for each question are indicated at the beginning of the question. Questions 3 – 6, pertain to the Case Study, which is enclosed inside the front cover of this exam booklet.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

#### Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam GHADV.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.



## **CASE STUDY INSTRUCTIONS**

**The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.**

**\*\*BEGINNING OF EXAMINATION\*\***  
**Morning Session**

- 1.** (5 points) You are an actuary for a managed care organization.
- (a) (1 point) List future trends affecting pharmacy program management.
  - (b) (2 points) Describe prescription drug program management components.
  - (c) (2 points) Describe typical delivery system classifications of commercial behavioral health services.

**2.** (5 points)

(a) (1 point)

- (i) Define Opportunity Analysis for evaluating care management programs.
- (ii) List components needed to perform an Opportunity Analysis.

You are given the following population stratifications for disease management (DM) programs.

- Episodic only and chronic only population
  - Episodic, mental health, and chronic conditions
  - Population based on predictive risk score
  - Population with diabetes
  - Population defined by clinician rules
- (b) (3 points) Describe the strengths and weaknesses for each stratification using principles of Opportunity Analysis.
- (c) (1 point) Describe how to identify cost-effective DM programs through a focused review of relevant literature.

*Questions 3 through 6 pertain to the Case Study.  
Each question should be answered independently.*

**3.** (9 points) The CFO of Royale Health has asked you to prepare a report regarding stop loss coverage.

(a) (2 points) Describe types of leveraging that impact what Royale Health will pay on specific stop loss (SSL) policies.

(b) (3 points) You are given the following table:

Variable	Low	Medium	High
Claim size			
SSL deductible			
SSL benefit max			
Unit cost trend for specialty Rx			
Prevalence of case-rate contracts			

(i) (1 point) Complete the table with illustrative values for each variable and scenario.

(ii) (2 points) Explain the impact of each variable on SSL claims changes relative to the average medical claims trend.

Royale Health is quoting (SSL) insurance to Moonraker. You are given the following:

- The SSL deductible is \$50,000
- There is no maximum to SSL benefits
- Annual medical cost trend is 10%
- Moonraker's claims in Exhibit 17

(c) (2 points) Calculate the leveraged trend for the 2016 and 2017 policy periods for each of claimants B, O, N, D. Show your work.

(d) (2 points) Propose actions Royale Health should take to ensure its specific SSL pricing appropriately reflects the impact of leveraging.

*Questions 3 through 6 pertain to the Case Study.  
Each question should be answered independently.*

**4.** (7 points) You are the reserving actuary for Quantum Health Insurance Company. You have been asked to look at the small group reserving calculations.

- (a) (1 point) Explain why it might be necessary to apply smoothing techniques to development factors.
- (b) (4 points) Calculate the smoothed factor for the 2<sup>nd</sup> lag month using the age-to-age factors in Exhibit 5 and the following methods:
- average 8
  - 6 of last 8
  - sum of digits
  - constantly declining percent of 85%

Show your work.

You review the incurred and paid claims for November. As of December, the incurred and paid claims for November is \$75,000.

- (c) (1 point) Calculate the expected claims payments in December for the November incurral date using the:
- original age to age factor
  - sum of digits smoothed factor

Show your work.

- (d) (1 point) Recommend the age-to-age development factor to use for November claims in December. Justify your answer.

*Questions 3 through 6 pertain to the Case Study.  
Each question should be answered independently.*

**5.** (7 points) In reference to Exhibits 6-6C, Quantum is discussing establishing bundled payment rates for knee replacements with its provider network.

(a) (1 point) Describe contracting considerations for bundled payments.

The payment bundle for knee replacements in Exhibit 6C will be allocated to service categories (professional, medical equipment and supplies) according to the projected 2017 costs.

Assume a 0% trend on professional services and medical equipment and supplies from 2015 to 2016.

(b) (2 points) Calculate the 2017 change in payment for each hospital under this proposal. Show your work.

Quantum’s contracting team informs you that the cost impact of bundled payments should not exceed the approved 2017 budget. The approved budget impacts for 2017 hospital contract changes are:

Facility	2017 Chargemaster increase	Knee Replacement Facility Charges – Payment provision for 2017
Hospital A	5%	\$5,625 per day
Hospital B	8%	40% of charges
Hospital C	10%	\$5,820 per day up to 3 days - then 50% of billed charges

Assume the length of stay for all cases is 3.2 days.

(c) (2 points) Calculate a global bundled payment rate for 2017. Show your work.

(d) (2 points)

(i) Recommend hospital-specific bundled payment rates for 2017. Justify your answer.

(ii) Describe advantages and disadvantages of your recommendation.



*Questions 3 through 6 pertain to the Case Study.  
Each question should be answered independently.*

- 6.** (6 points) Le Chiffre has asked you to review the effectiveness of the HoldEM disease management (DM) program.
- (a) (1 point) Describe the actuarially-adjusted historical control methodology used for assessing DM financial outcomes.
  - (b) (2 points) Describe exposure considerations under the actuarially-adjusted historical control methodology.

In addition to Exhibit 8, Vesper Lynd has supplied the following information for the chronic illness populations:

Risk Scores by Population						
	HIV	Transplants	Cancer	Heart Failure	All Chronic	Indexed
Baseline Period	1.25	1.75	1.30	1.60	1.10	1.00
Intervention Period	1.30	1.80	1.35	1.70	1.12	1.01

- (c) (3 points) Calculate the savings from the DM program using the actuarially-adjusted historical control methodology. Show your work.

- 7.** (12 points) You are the Actuary for DEF Insurance Company. DEF is a leader in the individual health insurance industry in the United States.
- (a) (3 points) Describe the following types of antiselection:
- (i) External antiselection
  - (ii) Internal antiselection
  - (iii) Durational antiselection
- (b) (2 points) List tools available for:
- (i) Collecting underwriting information on insured members.
  - (ii) Analyzing the information collected on insured members.
- (c) (1 point) Create a chart of ACA individual mandate income tax penalties for 2014, 2015, and 2016.

You are given the following about one of your blocks of policies for 2016:

- Premium is \$1,000 annually,
    - There are no administrative expenses or profit built into this premium.
  - Deductible is \$100 annually.
  - 80% of policyholders are healthy, with an expected annual claim cost of \$1,000.
  - 20% of policyholders are unhealthy, with an expected annual claim cost of \$2,000.
  - The expected savings of an average policyholder moving to a \$200 deductible is estimated at 5% of premium.
  - It is expected that all healthy policyholders will move to the \$200 deductible and all unhealthy policyholders will stay with the \$100 deductible.
  - All policyholders in this block will be given a rate increase of 20% the next year.
- (d) (3 points) Calculate:
- (i) (2 points) The amount of premium leakage. Show your work.
  - (ii) (1 point) The buy-down effect. Show your work.

## 7. Continued

You are asked to consider the potential tax penalties if your policyholders terminate coverage. You are given the following information:

- The national average bronze plan total yearly premium is \$5,000 for individual coverage and \$8,000 for family coverage.

	Policyholder 1	Policyholder 2	Policyholder 3
Family Size	two adults	one adult and one child	two adults and two children
2016 annual income	\$40,000	\$50,000	\$75,000
Tax filing threshold	\$4,000	\$2,000	\$4,000

- (e) (2 points) Calculate the tax penalty for each policyholder for 2016. Show your work.
- (f) (1 point) Recommend a strategy for DEF to reduce antiselection. Justify your recommendation.

**8.** (9 points)

- (a) (2 points) Compare and contrast Total Savings and Return on Investment (ROI) for measuring results of a disease management (DM) program.

The CEO of ABC Insurance has requested a valuation of a DM program that was implemented at the beginning of Year 1. You have been provided with the following information on ABC Insurance (PPPM = Per Participant Per Month).

	Claims Costs PMPM	Membership
Year 0	\$1,400	250,000
Year 1	\$1,500	275,000

DM Participants	Participation Count	Baseline Claims Cost PPPM	Intervention Period Claims Cost PPPM
Low Risk	7,600	\$900	\$960
Medium Risk	1,500	\$1,500	\$1,700
High Risk	950	\$2,500	\$2,800

Control	Participation Count	Baseline Claims Cost PPPM	Intervention Period Claims Cost PPPM
Low Risk	12,000	\$900	\$1,000
Medium Risk	7,600	\$1,500	\$1,800
High Risk	3,500	\$2,500	\$3,000

Program Costs	Costs PPPM
Low Risk	\$25
Medium Risk	\$100
High Risk	\$250

- (b) (2 points) Calculate the following for ABC Insurance's DM program. Show your work.
- (i) Total Savings
  - (ii) ROI
- (c) (2 points) Calculate the change in ABC Insurance's claims cost trend as a result of the DM program. Show your work.

## **8. Continued**

The CEO wants to know if the program should be continued for the Medium Risk and High Risk populations.

- (d) (2 points)
  - (i) Calculate the ROI for each of the Medium and High Risk populations. Show your work.
  - (ii) Describe considerations to improve program results for the Medium and High Risk populations.
- (e) (1 point) Explain the potential benefits of using propensity scoring for analyzing ABC's DM program.

**\*\*END OF EXAMINATION\*\***  
**Morning Session**

**USE THIS PAGE FOR YOUR SCRATCH WORK**