Alcohol Use Disorder: An Interprofessional Case-Based Exercise

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Abstract

This resource is a case of a man with alcohol use disorder (AUD) who presents to a multidisciplinary clinic for care after an alcohol-related injury. The case was designed to help students recognize AUD in patients and clients and to facilitate their development of an interprofessional care plan. The resource includes a detailed faculty facilitation guide, which was designed to help students consider their own roles and recognize the roles of other health care providers in patient care. Case details for students, additional AUD information for facilitators, and a bibliography are also included.

This case was developed for an interprofessional education (IPE) elective at our institution in 2013. The goal of the course is to allow students from various health sciences schools to learn with, from, and about each other in the context of patient care. One component is a set of small group case discussions that focus on each health care profession's role in and contribution to patient care. Cases that are developed for this course are designed to be sufficiently complex as to require the input from multiple health care professions. This case focused on Alcohol Use Disorder (AUD) to emphasize that health care professionals from various fields can (a) identify AUD and (b) contribute to the management of individuals with AUD. The case was developed with the input of clinicians from various health care professions, an educator with expertise in case writing, and researchers with expertise in the biomedical consequences of AUD.

The case was used with students from numerous health care professions. Students were given online access to articles on AUD, provided the initial information for the case, and asked to prepare their responses to the initial questions before coming to class. To assess the effectiveness of the case in helping students achieve the learning objectives, an online pretest survey was administered to students. The same survey was delivered on paper after the case discussion. The final component of the session was a demonstration of the Alcohol Use Disorder Identification Test (AUDIT) with a simulated patient.

Analysis of the results of pre- and post-case discussion surveys showed that after preparing for and participating in the case discussions, students were better able to identify the AUDIT as a useful screening tool, recognize binge drinking patterns, and identify biomedical consequences of AUD. A debriefing with faculty facilitators after the case revealed that facilitators felt that student learning occurred, the discussions had focused on interprofessional aspects, and that the case should be utilized again in future offerings of the course.

Patrick Rourke – Instructor's Guide

List of Resource Files:

Patrick Rourke - Instructor's Guide
Patrick Rourke - Facilitator's Guide
Patrick Rourke – Initial Information
Patrick Rourke – Additional Information
Additional Perspectives on AUD
Bibliography

Use of Resource Files:

This case is intended to be discussed with small groups of students in different healthcare professions. The number of students may depend on users' circumstances, but there should be a sufficient number to represent several different healthcare fields. (At the authors' institution, groups were comprised of 12-14 students from up to 10 professional programs.) Facilitators may include faculty or practicing providers in any health care profession.

Students review the document, "***Patrick Rourke – Initial Information***" prior to attending the session. Once the initial discussion has taken place, students should be provided with the document, "***Patrick Rourke – Additional Information***."

The "***Facilitator's Guide"*** is designed to help the facilitator lead the discussion from beginning to end of the session and contains instructions on when to refer to different parts of the case.

Information about AUD and links to pertinent literature, as well as the perspectives from some of the students and faculty in various health care professions at the authors' institution, has been provided for the facilitator in the document, ***"Additional Perspectives on AUD"***. It is anticipated that facilitators will not be experts on the contributions of different health care professionals in the management of AUD, so this is intended to provide some of that expertise. This document may be used by the facilitator throughout the session for clarification or may be provided to the students after the discussion.

Goals and Objectives / Conceptual Background:

This case was developed for an interprofessional education (IPE) elective at our institution in 2013. The goal of the course is to allow students from various health sciences schools to learn with, from, and about each other in the context of patient care. One component is a set of small group case discussions that focus on each health care professional's role in and contribution to patient care. Cases that are developed for this course are designed to be sufficiently complex as to require the input from multiple health care professions. This case is focused on Alcohol Use Disorder (AUD) to emphasize that healthcare professionals from various fields can (a) identify AUD and (b) contribute to the management of individuals with AUD. It is the third case discussed by the students and is situated in the last half of the course.

The case and the ***"Facilitator's Guide"*** were designed to facilitate the flow of a small group discussion. Clear instructions on the use of the case are provided, along with suggestions for tailoring the case and the guide to one's own educational context. The case was developed with the input of clinicians from various health care professions, an educator with expertise in case writing, and researchers with expertise in the biomedical consequences of AUD. The format of the case is similar to other cases in the course with respect to the order in which students receive information, the facilitator guide, and the expected structure of the group discussions. Course instructors and other faculty members were trained to facilitate discussions using recognized principles of small group learning.

The learning objectives for this case are included below. These may be expanded according to users' environment or educational context. After completing assigned readings and participating in this discussion, students should be able to:

- Recognize the prevalence and frequency of Alcohol Use Disorders (AUD) in the general population
- Identify AUD among patients
- Recognize the most frequent comorbid conditions associated with AUD
- Establish plans for intervention using an interprofessional approach to the management of individuals with AUD

Implementation:

Student groups should be comprised of different health profession students – the exposure the students get to the various perspectives increases with the number of professions that can be feasibly included. Students should have had some clinical experience (at least one year if possible), and if possible, it is beneficial to include students with similar clinical experience e.g. approximately same amount of clinical rotations previously completed. Students should be provided with "***Patrick Rourke – Initial Information***" and reading materials prior to the case discussion.

One facilitator is sufficient if faculty resources are limited, but it can be extremely effective to have several facilitators from different healthcare fields, which serves two purposes. It models effective interprofessional collaboration and allows experts in various healthcare fields to provide their own professional perspectives on aspects of the case. If more than one facilitator is present, one should be identified as the primary facilitator (these roles are elucidated in the ***Facilitator's Guide***).

Faculty should bring "***Patrick Rourke – Additional Information***" and the ***Facilitator's Guide*** with them, but no other materials are required. Facilitators can best prepare by reviewing the "***Facilitator's Guide"*** and "***Additional Perspectives on AUD"*** as well as familiarizing themselves with the readings that are assigned to the students.

Successful Use of the Resource:

At the author's institution, the case was first used in 2013. Six groups of 12-14 students were each facilitated by 2 to 3 faculty members from various schools. The size of the groups was determined based on physical space and faculty availability. Groups included students from medicine, dentistry, nursing, public health, physical therapy, occupational therapy, rehabilitation counselling, speech and language pathology, audiology, clinical laboratory science, physician assistant, and pharmacy. Relevant articles on AUD (provided in this resource in ***"Bibliography"***) were identified by researchers and

delivered to the students online**.** Students were provided "***Patrick Rourke – Initial Information***" and asked to prepare their responses to the initial questions before coming to class. 90 minutes were allowed for the small group discussion. Because of local expertise in administering the Alcohol Use Disorder Identification Test (AUDIT), a demonstration of the AUDIT with a simulated patient followed the small group discussion, and students were encouraged to ask questions regarding AUDIT administration afterwards. This session took about 30 minutes. The authors believe that this demonstration was helpful but not necessary for the case to be effective.

To assess the effectiveness of the case in helping students achieve the learning objectives, an online multiple choice pre-discussion survey was administered to students. The same survey questions were administered on paper after the case discussion. Analysis of the results showed that after preparing for and participating in the case discussions, students were better able to identify the AUDIT as a useful screening tool, recognize binge drinking patterns, and identify biomedical consequences of AUD. Students actually overestimated the prevalence of AUD after the discussion, as seen in the first row of the table.

Survey Question Content	Percentage of Students With Correct Answer	
	Pre-discussion Survey	Post-discussion Survey
Prevalence of at risk drinking	62%	58%
Intended use of AUDIT	78%	92%
Definition of binge drinking in men	35%	42%
Definition of binge drinking in women	29%	39%
Identification of conditions caused by AUD	86%	100%

Researchers from the LSUHSC Comprehensive Alcohol Research Center observed each group and made notes. Alterations to the case and to the ***Facilitator's Guide*** were made based on the notes from the case observers and are reflected in this submission. A debriefing with faculty facilitators after the case revealed that facilitators felt that student learning occurred, the discussions had focused on interprofessional aspects, and that the case should be utilized again in future offerings of the course.

Users are encouraged to solicit the input from various health care providers in their own institutions to further expand the information found in ***"Additional Perspectives on AUD***". One approach to achieving this is for users to conduct a "mock" case discussion with faculty from the various schools that will be represented, with observers making notes and compiling them into an "expert opinion" document that facilitators can reference during the discussions with students as necessary. This method has been used with success at the authors' institution for this and other cases that are utilized in this course.

Limitations:

We identify 2 limitations to the use of this case. First, the success of a small group case discussion depends largely on the skill of the facilitator, and to a smaller degree, on the clinical expertise of the facilitator. We recognize that the groups had different discussions despite providing facilitators with discussion guides. We believe that as long as the interprofessional aspects of care are emphasized, this is acceptable as a principle of small group learning. Second, use of this case assumes that students will read the assigned articles ahead of time. Failure to do so will result in significantly diminished contributions from students. This can be addressed by emphasizing the importance of preparation and including some assessment of the students' apparent preparation in their evaluations.

Patrick Rourke – Facilitator's Guide

Effective facilitation is critical to the educational value of the discussion, so a few tips for facilitators are included below. To effectively facilitate a small group discussion, a facilitator should:

- Know content for discussion and prepare ahead of time.
- Enlist learner perspectives.
    - Ask open-ended, probing questions and allow time for thinking (at least 3-5 seconds).
    - Rephrase comments; ask "what if" questions.
- Demonstrate respect for all opinions and reserve one's own opinion until students have contributed theirs.
- Listen actively and refer back to comments made by learners.
- Keep the discussion focused and keep track of time while allowing free thought/speech.
- Provide a wrap-up or summary, including learning issues for future independent study.

Ideally, the seating arrangement should be open, with the facilitator seated in a position that doesn't assume hierarchy (i.e. not at the head of the table). Asking the group to develop ground rules at the beginning can help to ensure respectful dialogue.

- Examples of ground rules might include:
    - All must maintain confidentiality
    - All must show respect and limit judgment on the patient and on one another.
    - All students will participate, but only one student will speak at a time.
    - Students should address the group rather than the facilitator.

For discussions with more than one facilitator, it is helpful to assign one facilitator to be the primary facilitator and for others to be secondary facilitators. The primary facilitator's responsibilities are to be prepared with respect to content, guide the discussion, and provide a summary after the discussion. The secondary facilitator's responsibilities include keeping time, listening actively for comments, and referring back to them as appropriate.

There are three sets of questions at the end of this facilitator guide – the first two sets are to be used when discussing the clinical facts of the case itself; the other is to be used to help students reflect on the interprofessional aspects of the care of the patient. The questions have been constructed to help students understand the perspectives of students in other fields. Facilitators should feel free to think of additional questions as may be appropriate for their context.

Students should be provided with the readings and the ***"Patrick Rourke - Initial Information***" document prior to attending the case discussion. After introductions have been made and ground rules are established, the facilitator should begin with the questions labeled: "**For use with 'Patrick Rourke – Initial Information'**". For each question, the facilitator should ask each student around the table for his/her answer. Hearing the rationale and understanding the importance of clinical information for various healthcare professionals provides insight into the approach that others use in their clinical assessments. Students should be encouraged to answer even if they are uncertain or unclear about something, but students may pass if they have no contribution to a particular question.

After all students have requested further information they would like to help them with their assessments, the facilitator should give them the ***"Patrick Rourke - Additional Information"*** document and point out pertinent information that was requested. After allowing a few minutes for students to review the information, the facilitator should proceed with the questions labeled: "**For use with Patrick Rourke – Additional Information.**" As with earlier questions, contributions from all students should be encouraged, even if they are unsure of their answers.

It will be useful for the students if the facilitator summarizes the contributions into a plan of care that might be initiated. After the students have agreed on the plan, the facilitator can proceed with the questions labeled: "**For discussion on interprofessional collaboration**." Depending on the amount of time allotted for the case discussion, this section can be omitted. However, the authors strongly believe that students should be given the opportunity to reflect specifically on the perspectives and contributions of health care professionals in other disciplines to Mr. Rourke's health and management plan.

For use with "*Patrick Rourke - Initial Information*"

- What additional history would you like to get from him or other individuals?
    - Why is that history important to you?
    - How does it help you in your assessment of his condition/situation?
    - How might it help you in your decision making regarding management?
- What specific maneuvers or physical examination findings would you try to elicit from him?
    - Why is the presence or absence of those findings important to you?
    - Are there other particular assessments that you will utilize? If so, what information will those assessments give you?
- Laboratory testing may have been done in the hospital but those results are unavailable. What laboratory or radiologic evaluation would you initiate?
    - How do you expect the findings from your evaluation to help you in your assessment?
- What other healthcare professionals might you consult and what might be their role in his care?

For use with "*Patrick Rourke - Additional information*"

- What is your assessment of his situation now that you have additional information? Can you identify a primary diagnosis?
- Does he have Alcohol Use Disorder? If so, by what criteria? What manifestations does he have that support the diagnosis of Alcohol Use Disorder?
- From your perspective in your profession, for what conditions is he at risk?
- Does his nutritional status play a role in your management?
- What is your professional approach to his care?
- Are there community resources that you want to utilize?
- Are there any particular ethical dilemmas you face in your specialty with respect to his care?
- How does bias and culture play a role in your approach to his care?
- What knowledge gaps have you identified in this case?
- What more to do you need to learn in order to determine a plan of evaluation and management? How will you go about learning that information?

For discussion on interprofessional collaboration

- Have you identified any areas of overlap in your discussion of Mr. Rourke's case?
- Are there interventions or management strategies that any discipline may use that might help to reinforce what another discipline is doing or thinking with respect to Mr. Rourke's care?
- What are some things you learned about another discipline that you did not know prior to today?
- How do you think Mr. Rourke's care might be affected by having multiple disciplines participate?
- How do you think his care might be compromised if this collaboration didn't exist?
- Are there systems issues (e.g. problems within the healthcare system) that could potentially affect his care? How might you work with other disciplines to address these problems?
- How are any ethical dilemmas that pertain to your patient similar or different from those of other disciplines?
- How does your scope of practice differ from that of other disciplines with respect to this case?
- What courses that you have taken so far have contributed the most to your expertise in this case? How did those courses help you? What was the structure of the courses – compare across professions?

Patrick Rourke – Initial Information

History: Patrick Rourke is a 50 year-old male who is being seen in your multidisciplinary clinic for a follow-up visit after a hospitalization. A quick review of his chart reveals that he was taken by EMS to the ER after a fall down his back steps. He was noted to have a tibia fracture on the left. He was kept overnight because he was incoherent and unable to drive himself home. His blood alcohol level on presentation was .15% (over the legal limit). Other issues that were noted during his 2 day hospital stay were poorly controlled hypertension and significant dental caries. He was discharged 2 weeks ago and has come to your clinic on a recommendation from his hospital physician. He has not previously had a regular medical home. Upon further questioning, he reveals that he had a fall 3 years ago when entering his home one night after going out with friends. He had an ankle sprain with that injury.

You will each see Mr. Rourke and perform your assessment. You will then meet as a group to determine what additional information you need and to devise a plan of care as a team.

Physical Examination:

Vital Signs: HR 90 RR 24 BP 156/88 T 98.7 BMI 28 kg/m2 (overweight)

General: Alert and oriented.

HEENT: Multiple dental caries with gingivitis noted. Cervical lymphadenopathy (small firm nodes). Sclerae slightly icteric.

CV: Regular rate and rhythm with no murmurs, 2+ distal pulses

Lungs: Course breath sounds bilaterally

Abd: Slightly protuberant abdomen, no hepatosplenomegaly, normal bowel sounds, nontender

Ext: Good perfusion. Cast on left leg. Otherwise full range of motion all joints, no obvious edema. Low muscle mass with thin legs compared to trunk.

Skin: Dry throughout without rashes

Neuro: Normal except for tremor with hands outstretched

Questions to consider before class:

- What additional history would you like to get from him or other individuals?
  - Why is that history important to you?
  - How does it help you in your assessment of his condition/situation?
  - How might it help you in your decision making regarding management?
- What specific maneuvers or physical examination findings would you try to elicit from him?
  - Why is the presence or absence of those findings important to you?
  - Are there other particular assessments that you will utilize? If so, what information will those assessments give you?
- Laboratory testing may have been done in the hospital but those results are unavailable. What laboratory or radiologic evaluation would you initiate?
  - How do you expect the findings from your evaluation to help you in your assessment?
- What other healthcare professionals might you consult and what might their role be in his care?

Patrick Rourke - Additional Information

Past medical history: History of hypertension diagnosed several years ago, treated briefly with unknown medication, now on no medication except for prescription opioids to treat pain associated with the tibia fracture.

Diet history: Mostly fast food and junk food, high carbohydrate/high fat

Social history: Has drunk at least 3 beers/day for 35 years during the week, and at least a 6 pack of beer on Saturdays and Sundays. Had a previous fall related to alcohol intoxication. No tobacco or other drug use. Works for a landscape company doing yard work for slightly over minimum wage, and has not showed up some days because of hangover symptoms. Complains of aches and pains on the job. Has a GED, which limits his ability to explore alternate jobs. Has a girlfriend who lives with him in a rented apartment. She has encouraged him to stop drinking and wants to help him, but she has threatened to leave him if he doesn't stop. He has a cell phone.

Family history: Father with history of alcoholism – passed away of heart disease age 70. Mother passed away from cancer age 78.

Other findings on physical examination: 1+ pitting edema, 4-extremity BP all 150s/80s. Cardiac apical impulse displaced (indicates enlarged heart). Muscle strength 4/5 in hands, elsewhere 5/5. Balance and gait normal.

Findings from screening for alcohol use disorder: Often needs to drink in the mornings to treat hangover symptoms before going to work. Irritated by girlfriend's criticism of drinking, but readily admits to wanting to cut down.

Laboratory Tests (normal ranges indicated in brackets):

WBC 5.0 x 10^3/uL [4.0-10.5 x 10^3/uL]
RBC 5.0 x 10^6/uL [4.1-5.8 x 10^6/uL]
Hemoglobin 15.0 g/dL [12.6-17.7 g/dL]
Na 145 mEq/L [136 – 146 meq/dL]
K 4.3 mEq/L [3.5 – 5.0 meq/L]
Cl 109 mEq/L [102 – 109 meq/L]
HCO3 29 mEq/L [22 - 30meq/L]
BUN 11 mg/dL [7 – 20 mg/dL]
Creatinine 0.9 mg/dL [0.6 – 1.2 mg/dL for males]
Glucose 120 mg/dL [100 – 125 mg/dL]
Ca 9.6 mg/dL [8.7 – 10.2 mg/dL]
Ph 3.8 mg/d L2.5 – 4.3 mg/dL]
Albumin 3.0 g/dL [4.0 – 5.0 g/dL]
Total protein 6.2 g/dL [6.7 – 8.6 g/dL]
Uric acid 6.2 mg/dL [3.1 – 7.0 mg/dL]
Bilirubin (total) 1.5 mg/dL [0.3 – 1.3 mg/dL]
GGT 100 U/L [9 – 58 U/L]
ALT 150 U/L [7-41 U/L]
AST 300 U/L [12 – 38 U/L]
LDH 129 U/L [115 – 221 U/L]
Alk Phos 225 U/L [33 – 96 U/L]
PTT 30 seconds [27 – 38 sec]
PT 17 seconds [12.7 – 15.4]
Amylase 300 U/L[20 – 96 U/L – method dependent]
Lipase 120 U/L [3 – 43 U/L]
EKG – left ventricular hypertrophy

Additional Perspectives on AUD

The following is a set of definitions and information that students may find useful as they work through the case.

Diagnosis of Alcohol Use Disorder: The recently updated Diagnostic and Statistical Manual of Mental Disorders, currently in its fifth edition (DSM-V, 2013), provides diagnostic criteria for all major psychiatric disorders, including alcohol use disorder (AUD). AUD is categorized into mild, moderate, and severe sub-classifications according to the cumulative presence of eleven diagnostic criteria. Several tools are available for discerning risky drinking patterns and AUD, including the following, which are described by Allen and Wilson (2003) on the National Institute of Alcohol Abuse and Alcoholism (NIAAA) website.

CAGE Questionnaire: This succinct AUD screen asks four simple questions, and is a favorite tool among nurses and general practitioners.

Link: **http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/InstrumentPDFs/16_CAGE.pdf**

Citation: Ewing, J.A. (1984). Detecting alcoholism: The CAGE questionnaire. *JAMA: Journal of the American Medical Association, 252*, 1905–1907.

Alcohol Use Disorders Identification Test (AUDIT): This 10-item questionnaire was developed by the World Health Organization to identify drinking patterns that might compromise health. It includes a screen of drinking amount and frequency, as well as questions related to personal problems caused by alcohol use.

Link: http://pubs.niaaa.nih.gov/publications/Audit.pdf

Citation: Saunders, J.B., Aasland, O.G., Babor, T.F. & de la Fuente JR, G.M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. *Addiction, 88*(6), 791-804.

Timeline Followback (TLFB): This assessment uses a calendar to measure retrospective drinking for up to a year, and is useful for understanding past and recent drinking patterns.

Link: http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/InstrumentPDFs/13_TLFB.pdf

Citation: Sobell, L.C. & Sobell, M.B. (1992). Timeline Follow-back: A technique for assessing self-reported ethanol consumption. In J. Allen & R. Z. Litten (Eds.), *Measuring Alcohol Consumption: Psychosocial and Biological Methods* (pp. 41-72). Totowa, NJ: Humana Press.

Addiction Severity Index (ASI): This semi-structured interview lasts approximately one hour and focuses on a composite of recent and lifetime problem areas in alcohol-abusing patients, including family/social status, employment, and psychiatric co-morbidity status.

Link: http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/InstrumentPDFs/04_ASI.pdf

Citation: McLellan, A.T., Luborsky, L., O'Brien, C.P. & Woody, G.E. (1980). An improved diagnostic instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous & Mental Diseases, 168,* 26-33.

The U.S. Preventive Services Task Force recommends routine screening for unhealthy alcohol drinking with the use of the AUDIT or CAGE questionnaires in primary care settings. The group also recommends brief counseling interventions in primary care settings to reduce alcohol misuse and referral to specialty treatment for those suffering from dependence/severe alcohol use disorder, including Alcoholics Anonymous (AA) or similar support group attendance, or a possible day treatment program.

The American Society of Addiction Medicine recommends the administration of benzodiazepines for the management of alcohol withdrawal symptoms and has published criteria for recommending specialty care.

The following information represents the perspectives of health care professionals and questions from health care professions students from the authors' institution as they worked through this case.

***Medicine**:* Chronic alcohol consumption is associated with altered bone metabolism, decreased bone mineral density, and increased risk of fractures, despite lack of liver failure. Overall, the prevalence of osteoporosis in alcoholics has been estimated at greater than 40%. Unhealthy alcohol use may lead to multitude of chronic diseases including: hypertension, depression, insomnia, abnormal liver-enzyme levels, heartburn, anemia, thrombocytopenia, injury, or problems in social life or at work (e.g., missed work due to hangovers). Approximately 50% of cases of cirrhosis, nonischemic cardiomyopathy, pancreatitis, and cancers of the esophagus, larynx, and mouth are attributable to alcohol.

***Clinical Laboratory Sciences**:* Another alcohol use biomarker ethyl glucuronide would be useful. It typically is elevated due to relatively recent use although it can be elevated from use as far back as 3 months. Use of hair levels of ethyl glucuronide for detection of chronic use has been advocated but studies have shown significant false negative results. Another marker of heavy drinking is carbohydrate-deficient transferrin, although elevated levels are also present in other medical conditions.

***Occupational Therapy**:* Important questions to consider would be: How does he spend his time? Does he exercise? What amount of time is spent drinking and are ADL's (activities of daily living) and IADL's (Instrumental activities of daily living) impacted? We should identify balance or lack of balance in his lifestyle and where changes could be made. We should examine impact of drinking on his relationships with referral to social work regarding family intervention. An OT would address issues with role performance and help to identify which roles are most impacted by AUD then help to alter routine redevelop skills, assist with new coping strategies and recommend a support group. Education on trigger identification, stress management, nutrition education, and balance of routines are helpful.

Physical Therapy: If he has chronic alcoholism, he could have axonal degeneration in the some neurons of both the sensory and motor systems. This usually occurs more distally first; he may also have paresthesia. Motor symptoms can include decreased or absent DTRs (deep tendon reflexes). He may experience frequent falls and gait unsteadiness due to ataxia, which can be due to cerebellar degeneration. Often alcohol is not the only underlying etiology; nutritional deficiency can also contribute.

Rehabilitation Counseling: Important questions to consider would be: Might he be under-reporting his alcohol consumption? Has there been a recent escalation in his drinking pattern? Does he think he is an alcoholic; does he think drinking is a problem for him? Does he want to do anything about it? What made him start drinking at age 15?

Dentistry: Dental checkups are very costly, as are dental procedures - how can adequate care be provided?

Bibliography

Relevant articles on AUD provided to students and instructors:

Friedmann, P.D. (2013). Alcohol use in adults. *N Engl J Med,* 368(17), 1655-1656.

Saitz, R. (2005). Clinical practice. Unhealthy alcohol use. *N Engl J Med,* 352(6), 596-607.

Additional AUD-related articles from the perspective of various health professions:

Bakhshi, S. and While, A.E. (2013). Health professionals' alcohol-related professional practices and the relationship between their personal alcohol attitudes and behavior and professional practices: a systematic review. *Int J Environ Res Public Health*, 11(1), 218-48.

Friedlander A.H., Marder S.R., Pisegna J.R., Yagiela J.A. (2003). Alcohol abuse and dependence: psychopathology, medical management and dental implications. *J Am Dent Assoc*, 134(6), 731-40.

Littlejohn C., Holloway A. (2008). Nursing interventions for preventing alcohol-related harm. *Br J Nurs*, 17(1), 53-9.

Peterson A.M. (2007). Improving adherence in patients with alcohol dependence: a new role for pharmacists. *Am J Health Syst Pharm*, 64(5 Suppl 3), S23-9.

Zschucke E., Heinz A., Ströhle A. (2012). Exercise and physical activity in the therapy of substance use disorders. *ScientificWorldJournal*, 2012, 901741.

Additional information on alcohol use disorder diagnosis:

Allen, J.P. and Wilson, V.B. (2003). *Assessing alcohol problems: A guide for clinicians and researchers* (2nd edition), NIH publication number 03-3745, Bethesda, MD. Available online at: http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/index.pdf

Diagnostic and Statistical Manual of Mental Disorders (5th edition, 2013). American Psychiatric Association, Arlington, VA.

Normal ranges of laboratory test data can be obtained from:

Harrison's Principles of Internal Medicine (18th edition, 2011). McGraw–Hill, New York, NY.