Developing and Implementing a Geriatric Home Visit Program for the UCSD Student-Run Free Clinic Project

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Committee Member(s):
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ISP Chair: Dr. Ellen Beck
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TITLE: GERIATRIC HOME VISITATION PROGRAM

PROJECT SUMMARY:
This project created a home visitation program to bring home health care to UCSD's Student Run Free Clinic Project (SRFCP) patients with mobility or transportation issues. Medical students were offered the opportunity to do home visits under the close supervision of a faculty physician as part of the curriculum in the Underserved Medicine selective (SOM410) or Family Medicine (FPM 426) or Underserved Medicine (FPM 432) courses. An accompanying curriculum was developed regarding home visits, geriatrics, and assessing a patient's home environment as well as the patient's medical and social needs. Pre and post-experience quiz and evaluations were created for students participating in this experience to assess knowledge, skills and attitudes towards geriatrics and home visits. From November 2011 to January 2012, a total of ten home visits have occurred at the residences of five patients aged 43 to 78 years. Students were asked to email their impressions to the Chair (Dr. Beck) and ongoing feedback and evaluation will be sought for continual improvement of this curriculum in the future. The SRFCP is in the process of looking for a first (or second year) medical student to take this project on as a Student Manager at the Baker Clinic site.

BACKGROUND:

Between 2010 and 2030, the geriatric population (65 years of age and older) is expected to double, to reach approximately 72 million people. This translates to 20% of the United States population.[1,2] For most, being able to age at home, in a familiar environment allows for a better quality of life, sense of independence and functionality as well as availability for interaction with family and friends.[3] In 2007, approximately 1 million geriatric adults in the US were homebound; however, only 1% of Medicare patients were visited by their physician at home. [4,5]

An estimated 30% of older adults have some sort of functional disability associated with increased risk in negative outcomes and institutionalization.[6] Patients with chronic illness and general geriatric conditions often do not receive the standard of care when it comes to routine preventative treatment.[7] Low income seniors, who tend to have multiple chronic medical conditions (such as diabetes, hypertension, COPD, hyperlipidemia, depression etc), are at especially higher risk.

The modern health care system revolves around medical centers; places where physicians work together in "convenient" centralized locations. With age, transportation to said centers becomes more difficult, even in urban settings. In order to use public transportation systems, individuals need to have a reasonable fitness level, have the competence to follow maps or directions and the physical ability to endure transfers and long rides.[1] For some patients, this will cause both financial and physical hardship; potentially causing more harm than benefit.[2]

In the past, house calls were the main method in which patients received their medical care. As a group, 82% of physicians agreed that there was a role for house calls in the geriatric population. [4] However, in 2001, less than 18% of physicians made house calls and those that did averaged about 5 calls per week.[2] House calls have been shown to decrease health care utilization, improve medication management, and allow for the identification of safety issues within the home before patient care is jeopardized.[4] When home-based geriatric care management is available, improved quality of care and reduced hospitalization costs are seen among high-risk, lower income groups.[8,9]

Only three medical schools in the US require students to make more than six home visits throughout their educational career. [2] At the University of Rochester, School of Medicine, a home visitation experience was integrated into the ambulatory clerkship for 3rd year medical students. [10] Students focused on the medical management of geriatric patients and learned how to assess their patient's functional status during home visitations. At the end of the experience, 83% of participants had positive feedback; they stated that the experience affirmed the idea of humanity in medicine and provided valuable insight into their patient's life, their functional status, and psychosocial issues. [10]

Similar positive experiences were noted at the Mayo Clinic[6], Uniformed Services University[11] and Mc Gill University[3] as well.

Here at UCSD, medical students rarely have the opportunity to participate in home visits. However many students are exposed to the UCSD SRFCP as part of an elective, selective or clerkship. The UCSD SRFCP's goal is to improve the physical and mental health as well as wellbeing of individuals and families by providing access without obstacles to free, integrated, humanistic high quality healthcare to those uninsured and underserved.

The UCSD SRFCP has served over 4000 patients in the San Diego area since 2003 and at present, approximately 5.86% of the SRFCP patient population is aged 65 or older. With time, we expect that number to increase and thus the number of patients who could benefit from home visits to increase as well. This patient population faces various barriers that can prevent access to health care at the clinic sites: difficulty with ambulation, lack of transportation, loss of ability to drive, and in particular for the SRFCP patients, financial difficulties.

Last summer, 2010, SRFCP faculty physicians Drs. Smith, Johnson, Rodriguez and Brownell, demonstrated that there was a need for home-visitation among the SRFCP population. These physicians performed home visits to SRFCP patients from the Baker Elementary School site while that site was closed during the summer. The patients that were visited reported that they appreciated and enjoyed the experience. SRFCP anticipates providing patients with their services at the home weekly, monthly, or quarterly depending on patient needs.

Purpose:

This ISP aimed to:

(1) create a home visit experience for students enrolled in FPM 426, 432 or SOM410 courses
(2) develop relevant educational materials/handouts:
    a. how to identify risks for falls/potential hazards in the home
    b. impact of poly-pharmacy on geriatric health
    c. management of chronic illnesses in the elderly
(3) create pre and post experience quizzes to assess educational growth
(4) create brief evaluations to assess the impact of this experience on student education
(5) improve medical care to geriatric patients of the UCSD SRFCP during both visits at the clinic sites and by offering home visits

Methods:

As this ISP had multiple components, the following subsections will be discussed separately:

A) Design and Creation of Educational Materials
B) Assessment of Educational Improvement in Medical Student Knowledge
C) Implementation of the Home Visit Experience
D) Creation of Final Evaluations/Surveys/ Pre and Post quiz

A) Design and Creation of Educational Materials

This ISP aimed to enhance knowledge, as well as improve attitudes, in dealing with geriatric health and social issues in the context of a home visit. Specifically the goals of the educational component were to increase knowledge of:

1) identification, management and treatment of common chronic medical conditions
2) risks/hazards to the patient's well-being in the home environment
3) the obstacles to, and difficulties of obtaining, access to care

One goal of the home visit was to bring health care to those with difficulty accessing care at the clinic due to transportation or medical illness. Of the patients that were identified to most benefit from this service, the majority were elderly. Hence, in order to increase experience in dealing with, and subsequently treating, the older generation of patients, the handouts focused on common medical conditions in the geriatric population. This series of handouts was created based upon current practice guidelines. The following topics can be found in the accompanying appendix:

1) Overview of diagnosis, management and treatment of chronic diseases in the geriatric population –
   (a) Hypertension in the Elderly ---------- Appendix 25-26
   (b) Diabetes in the Elderly ---------- Appendix 27
   (c) Hyperlipidemia in the Elderly ---------- Appendix 28
   (d) Asthma in the Elderly ---------- ---- Appendix 29
   (e) COPD in the Elderly ---------- Appendix 30
   (f) Depression in the Elderly ---------- Appendix 31-32
   (g) Dementia in the Elderly ---------- Appendix 33

2) Osteoporosis / Fall Risk and Fall Prevention / Hip Fractures ------- Appendix 34

Additionally, references were included in the information packet. These references include:

1) Home Environment Safety Assessment ---------- Appendix 35
2) the FAST assessment of Alzheimer's Disease ---------- Appendix 36
3) the Beers Criteria for pharmacology ---------- Appendix 37
4) Katz Basic ADL and Lawton-Brody IADL Scales ---------- Appendix 38
5) Pharmacodynamics in the Elderly from *Duthie: Practice of Geriatrics* ------ Appendix 39
6) CDC Recommended Adult Immunization Schedule ---------- Appendix 40

In order to address the issues of obstacles to care and difficulties in access to care, participating attendings were asked to discuss these issues with the medical student assigned to accompany them during the half day session.

B) **Assessment of Educational Improvement in Medical Student Knowledge**

Another goal of this ISP was to increase student baseline knowledge of common medical and social issues faced by the geriatric population. In order to establish educational growth, a pre/post quiz was created and the content was evaluated by the ISP Chair and Committee. The quiz was included in the educational packet given to the students who are assigned to participate in the home visits. Ideally, students will complete the quiz prior to their home visit experience and then again after their experience. Additionally, in the pack of information given to the student, I created a handout for the quiz answers.

A) pre/post quiz ---------- Appendix 19-20
B) post quiz information ------- Appendix 21-23

In the future, the quizzes can be used to assess educational growth in a formal manner. IRB approval was requested and obtained. Currently, information derived from the quizzes (as well as evaluations) may be used under the IRB Project#111689X which has approval until December 1, 2012 (Appendix 41).

C) Implementation of Home Visit Experience

There were multiple components to the process of implementing the home visit experience. Hence, the following subsections will be discussed separately:

1) Curriculum Component
2) Patient Identification
3) Patient Scheduling
4) Identification/Scheduling of Attending
5) Identification/Scheduling of Students
6) Preparation for the Home Visit
7) Structure of the Home Visit Experience

Curriculum Component:

A handout of the home visit project was created to give students an overview of student expectations and overall goals of the project. Students were also given access to the educational material (the pre/post quiz, quiz answers, educational handouts and references) via email attachment. Refer to the following page to see the overview handout:

Geriatrics Home Visit Experience
UCSD Student Run Free Clinic Project

General Information:
The purpose of this project is to bring medical students into the homes of patients to learn what a home visit is and what it entails. Our goal is to increase knowledge and awareness regarding how to approach common medical conditions found in our SRFCP population but also, how to approach issues unique to our expanding geriatric population.

Ideally you will become more comfortable with how to manage and treat our patients with the 5 most common diagnoses seen in the SRFCP:

-hypertension
-hyperlipidemia
-diabetes
-asthma
-depression

We hope you will increase your knowledge and comfort level regarding:

-identification of obstacles the underserved elderly face regarding access to care
-understanding the implications of poly pharmacy
-importance of fall risk assessments and fall prevention
-how to identify risks/hazards in the environment
-emphasis on the medical, social, and physical well-being of our patients
-awareness of attitudes and biases
-the importance of trans-disciplinary team

Components:

- Quick Pre and Post "quiz" of baseline knowledge
- Information packet
- Home visit experience
- Brief evaluation
- Reflection of experience

Home visit:
This is designed to be a half-day experience. One to two medical students will accompany a SRFPC faculty member on home visits at a time. The patients you will see have difficulty accessing care at the clinic due to transportation or medical illness; not all patients are of geriatric age. This is your opportunity to explore not only the medical issues your patient faces but, also those associated with their social condition (access to transportation, safety of the home environment).

Patient Identification:

The home visits were designed to help bring health care to patients in need. Hence, current patients of the SRFCP (specifically the Baker Elementary site) who had particular difficulties getting to the clinic were identified by the attendings as well as by the support staff at the Baker Clinic site.

Loose criteria were used to help identify these patients. These "criteria" included:
-patients with severe mobility issues who cannot safely get to the clinic
-visual impairment
-recent hospitalizations/high acuity
-within reasonable proximity to clinic sites

Of note, geriatric age was not a requirement.

Identified patients were then contacted and asked if they would like to participate in a home visit experience. Specifically they were asked if they were willing to open their home to an attending faculty physician (accompanied by a medical student) in order to receive routine medical care.

These patients were then asked to verify their best telephone number and their current address. Patients were additionally asked if any new medical issues had arisen since the time of their last clinic visit and if they were in need of particular medications previously prescribed by the free clinic staff.

Patients were advised to a date and time at which an attending had agreed to participate in a home visit.

Scheduling of Patients:

Patients were identified based upon how beneficial a home visit would be to their health care according to faculty physician and staff opinion. Hence, the frequency of particular patient participation has and will vary greatly. Some patients were identified as individuals that would benefit from a one-time home visit (with time to evaluate the overall social situation). Some patients who were considered to be too ill, disabled or have difficulty obtaining transportation to clinic may have home visits integrated into their future routine care.

After an initial home visit, patients could be scheduled as frequently as weekly depending on their needs as decided by the attending physician.

Identification/Scheduling of Attending

The patient's primary language was identified so to match them with a provider who speaks their language. Although this has not yet occurred, should the attending be unable to speak the patient's native language, a translator may be scheduled to accompany the physician.

Drs. Smith, Johnson, Rodriguez and Brownell were involved in overseeing this project. Drs. Johnson and Brownell have alternated the role of faculty attending physician and have been accompanied by medical students on all visits since November 2011.

Identification/Scheduling of Students

Initially, Meaghan Hayes was participating in all home visit experiences associated with this project beginning in November 2011. Once the educational materials had been created and supply, as well as scheduling, difficulties solved, other medical students were then asked to participate and pilot the home visit project.

Medical students who specifically requested to participate (R.T., MSIV) were scheduled to do so. During Block 7 of the 2011-2012 school year, Carol Bloom -Whitener (program assistant, Family and Preventative Medicine) emailed the students enrolled in FPM 426 and 432 and asked if there were students who were particularly interested in home visits; she then began to schedule MSIVs, who were known to speak fluent Spanish, as part of their clerkship schedule. This is expected to continue for future blocks as well.

Preparation for the Home Visit

To date, Meaghan Hayes has been in charge of readying the patients, physicians and students for the home visit experience.

Patient identification is discussed with the attendings and staff, a decision is made as to which patients will be seen and then the selected patients are scheduled for home visits within the time constraints of physician and student availability.

All patients are to be contacted prior to the home visit so that patient phone numbers and addresses can be confirmed. Any additional needs (medications, social resources, etc) are inquired at this time.

Home visits have been scheduled approximately one day a week . Initially, once physician availability was established and a patient scheduled, a student was identified to participate. (Later, as mentioned above, student scheduling was done in advance by Carol).

Prior to each visit, the patients were given a reminder phone call. The patient's chart was accessed and photocopies of the latest and/or most relevant clinic notes and lab results were made. Upon assessing the chart and confirming with the patient, previously prescribed medications were re-filled in advanced by the SRFCP pharmacy staff so as to be available to bring along to the home visit. In addition, the Patient Assistance Program was asked if they require any new signatures or paperwork updated for any of the patients participating in the home visits – if any forms are required, these can be brought to the patient's home at the time of the visit.

Once all patient-specific supplies were obtained (notes, labs, medications, etc), the time and location of where the supplies could be handed to the physician/student team would be verified.

As these were home visits, a general supply bag which was (and is) carried to all home visits was created. This bag includes:

- folder – containing the relevant patient information
- copies of blank soap notes (regular as well as DM-specific)
- blank official letterhead in case the need arose to write "official notes" for the patient
- blank laboratory slips
- photocopies of directions to local laboratory locations
- copies of the most commonly used/requested social work handouts
- vital sign supplies: BP cuff, thermometer

- pairs of gloves
- wound care kit
- trash bags for non-hazardous waste

Structure of the Home Visit Experience

Home visits were (with few exceptions) scheduled for Tuesdays – either in the morning or afternoon in accordance with the Baker Clinic site hours.

1. The attendings were put into contact with their assigned student and decided where and when to meet for the home visit experience prior to the visit day.

2. Students were encouraged to access the information packet sent to them via email (containing the quiz, handouts, references).

3. The home visit supply kit (with relevant patient information and medications) was obtained from the clinic or a pre-defined location.

4. The attending and student met prior to arrival at the patient's place of residence. The faculty member would orient the students to the visits (in regards to what the goals of the home visit should be).

5. The attending/student team would then enter the patient home and have a clinic visit.

6. The attendings have been instructed to act as a translator (if needed) but to let the student run the encounter).

7. As medications had been filled previously, medications can be given at the time of the visit and altered as appropriate by the attending physician.

8. Attendings were additionally asked to hold a brief reflection session at the end of the afternoon in which each member of the team will identify key learnings from the site visits.

9. Students were to finish their encounter, write up their SOAP notes and go over these with the attending. Additionally, all notes, lab slips or any other pertinent paperwork was to be returned to the clinic and inserted into the patient's paper chart.

10. Upon return of all medical information and equipment to the clinic, the patient encounter is logged in the home visit binder as well as on the Free clinic site via the online database under the Home Visit subsection

D) **Creation of Student Evaluations**

As this ISP project will hopefully be *fully* integrated into the family medicine courses in the future, an evaluation of the project was created which asks students to identify two benefits as well as two concerns/issues that they had regarding the home visit experience. All forms (which are anonymous) will be returned to the Home Visit Manager in the future, and used to help improve the experience.

This evaluation is provided as Appendix 24

DATA/RESULTS

Home Visits:

As of January 17th 2011, ten home visits have been completed; the first visit associated with this project occurred in November 2011.

Visits have occurred on the following dates: 11/22/2011, 12/6/2011, 12/13/2011, 1/3/2011, 1/10/2011

Patients Seen:

Five independent patients have been seen via the Home Visit Program:

A) 67 year-old male with stage IV lung cancer on home hospice
B) the 67 year-old wife, of the patient above, who had multiple chronic medical conditions
C) 62 year-old blind woman with uncontrolled hypertension and diabetes caring for small children at home
D) 43 year-old woman with recent BKA and new large ulcer/osteomyelitis in the other foot likely requiring another BKA who had need to remain non-weight bearing
E) 79 year-old woman with uncontrolled diabetes and hypertension complicated by dementia dependent on her children for transportation

Student Participants:

I, Meaghan Hayes, participated in three of the early home visits. RT (FPM 426) and MB (FPM432), both fourth year medical students, have participated as well. A second year medical student (on ACA) also accompanied MB on one of their home visit experiences. Carol (program assistant) has scheduled more students to participate in the upcoming block.

Attendings:

Drs. Beck, Smith and Rodriguez have been overseeing this ISP project however, either Drs. Johnson or Brownell were involved in the direct patient care and medical student education as the attending faculty physician on record for the home visits completed thus far. Dr. Johnson is the Co-Medical Director of the Free Clinic Project. Both Dr. Johnson and Brownell were students at UCSD, and involved in the free clinic project, completed family medicine residencies and were our Fellows in Underserved Medicine. Thus they know the patient population and are excellent trusted role models for the students.

DISCUSSION:

Outcomes:

for patients -

Though the title of this ISP is: Developing and Implementing a Geriatric Home Visit Program for the UCSD Student-Run Free Clinic Project, the patients who were identified as having the most need for a home visit were not necessarily of geriatric age.

In any case, at all visits patient's vital signs were recorded, patients were spoken to, physical exams were performed and prescribed medications were dispensed. Patients that required additional home visits to ensure proper medical follow up were visited again as appropriate (one patient was seen three independent times via a home visit). Patients were able to have their laboratory tests ordered at the time of the home visit and given their lab slips for future use. As patient data is recorded in the SRFCP database, their information is being routinely updated. Per verbal report, the patient experience has been overwhelmingly positive with much emphasis on their "appreciation" of receiving medical care at home.

for students –

Per verbal report, the students have endorsed overall positive experiences as well and have expressed interest in participating in more home visits in the future. Dr Ellen Beck has been collecting personal reflections of participating students upon their completion of home visits.

ISP Committee Goals:

The ISP Chair and committee members were evaluating each step of the project and met their project goals. They oversaw the identification of participating patients. They reviewed the creation of the written curriculum, and pre and post-test assessments as well as program evaluations. They helped oversee the scheduling process as well as the integration of the visitation experience into the already established courses. The committee also continues to be involved as the project.

Personal Goals:

The overall goal of developing and implementing a home visitation experience was achieved. The pre and post quiz was created as was the student evaluation. Although not all patients were of geriatric age, the student packet of information was created and offered to the students as a reference tool to enhance their understanding of common geriatric/home visit knowledge via email attachment. Faculty physicians were successfully paired with students who then were scheduled and completed visits to patient homes.

Obstacles to Overcome/Future Plan:

The home visit experience has been as fully integrated into the FPM courses as was initially planned. However, with a limited student population having participated to date, the evaluations have not yet been distributed to participating students. Nonetheless, the evaluation is available for future use to formally assess how comfortable the students feel with dealing with chronic medical conditions faced by our patients, whether the experience helped to increase their comfort level and, what opinions they have as to how to improve the experience.

In addition, in the future, the patients could be offered the opportunity to provide written feedback via mailed evaluations or a brief telephone interview with a free clinic promotora (health promoter) regarding:

a. specifics they liked about having a home visit
b. identification of ways to improve the project from a patient standpoint
c. patients may provide verbal feedback of the visits as well

Project Sustainability

As I am a fourth year medical student, a student manager position at the Baker Clinic site was created so that the scheduling of, and preparation for, the home visits could continue. Currently the SRFCP is in the process of identifying the new Student Manager. Once identified, I will go through the entirety of the project with this new manager and address: how to manage the patient/attending/student scheduling, pharmacy involvement, general supply sustenance and further integration of the educational and evaluation materials into the home visit experience.

There are also plans to formalize a Home Visit Reference Binder to keep in the Baker Clinic for all students to be able to access. In addition, it would be feasible to create a referral form in the event that a student and supervising attending feel that their patient could benefit from the home visit experience.

Concluding Thoughts:

The end points as previously noted by the Chair in the ISP proposal were essentially met:

1. *A geriatric home visit program will have been implemented*
2. *A brief curricular module for the medical students participating in the home visiting program will have been developed and implemented*
3. *A brief evaluation of the program, including improvements in student knowledge will have been performed*
4. *A final report describing the above three steps will have been completed.*

Points 1 and 2 have been completed. This document serves as point 4 above. As previously mentioned, in regards to point 3, the student evaluations were created however, evaluations have not been formally distributed at this point in time. There are plans to use these formal evaluations to monitor improvements in student knowledge, skills and attitudes in future blocks now that home visits have been integrated in the Family Medicine clerkships. In any case, verbal reports as well as the written reports to Dr. Beck have been overwhelmingly positive.

Personally, my goals were met – while working with the Baker Clinic, health care was brought to the homes of the patients that needed it the most. Educational materials were created and distributed to participating students. And, most importantly, per verbal reports, the students that have participated in the program thus far have had overwhelmingly positive experiences. While working on this project, I had to deal with numerous unforeseeable challenges – changes in funding, physician availability, implementing a new program during the holiday season, etc. Learning how to identify and adapt to these challenges was an invaluable learning experience.

With the identification of future leadership for this project, we hope the project will continue into future years.

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-awareness of attitudes and biases
-the importance of trans-disciplinary team

Components:

- Quick Pre and Post "quiz" of baseline knowledge
- Information packet
- Home visit experience
- Brief evaluation
- Reflection of experience

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UCSD Student-Run Free Clinic Project: Geriatric Home Visit Program
Identifier: _____ Date: _____

1. The geriatric population in the US will be _____% of the total population in 2050.
   (a) 5%
   (b) 10%
   (c) 15%
   (d) 20%
   (e) 25%

2. The **overall** most common chronic condition in the elderly population is:
   (a) HTN
   (b) DM
   (c) deafness
   (d) arthritis
   (e) cataracts

3. The most common form of dementia in the US is due to:
   (a) Alzheimer's Disease
   (b) Frontotemporal Dementia
   (c) Cerebral Vascular Disease
   (d) Parkinson's Disease
   (e) Dementia with Lewy Bodies

4. The prevalence of impotence in geriatric males is:
   (a) 25%
   (b) 33%
   (c) 50%
   (d) 66%
   (e) 75%

5. What percent of the geriatric female population will sustain a fracture related to osteoporosis?
   (a) 15%
   (b) 20%
   (c) 33%
   (d) 50%
   (e) 75%

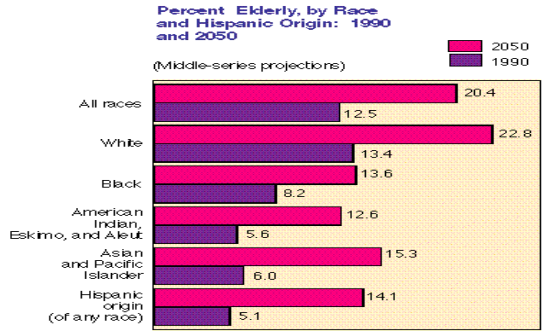
6. Which of the following does not NEGATIVELY impact prescription medication adherence:
   (a) Financial status of patient
   (b) Number of prescriptions
   (c) Long durations of therapy
   (d) Complex scheduling
   (e) Type of container

	true	false	unsure
7. 65% of persons aged 60 or older have hypertension.			
8. Incontinence rates are equivalent for males and females over 80yrs.			
9. 50% adults who are hospitalized as a result of a hip fracture are unable to return home to independent living.			
10. The most common cause of falls is due to accidents rather than medical issues.			
11. Up to 66% of patients who fill their prescriptions use their medications in a manner different from that intended.			
12. The CDC recommends no additional annual vaccines other than the flu vaccine over age 65			
13. Non-Hispanic males >85yrs have the highest rate of suicide in the US.			
14. American Diabetes Association (ADA) recommendations stricter control of blood glucose level in geriatric patients.			
15. Depression in the elderly patient may manifest as somatic (rather than mood) complaints.			

POST QUIZ INFORMATION

(1) Population Dynamics

The US Census reported that between 1900 and 1994 the elderly population expanded 11 –fold whereas the non-elderly population increased by only 3-fold. By 2030, it is estimated that approximately 1 of every 5 Americans will be age 65 or older– which translates into further need for geriatricians in the upcoming years.



US Census Bureau. Population profile of the United States. http://www.census.gov/population/www/pop-profile/elderpop.html

(2) Common Chronic Conditions

Although it is not surprising that arthritis is a common complaint with age, note hypertension and heart disease are also common findings among older patients as well.

Parentheses indicate prevalence per 1000 persons.

men age >75	women age >75
1. Deafness (423.5)	**1.** Arthritis (583.5)
2. Arthritis (409.6)	**2.** Hypertension (463.3)
3. Hypertension (342.1)	**3.** Deafness (307.3)
4. Diseases of the heart (324.3)	**4.** Diseases of the heart (247.9)
5. Cataract (214.1)	**5.** Cataract (246.9)

Deaths by age and leading cause

Aged 45 to 54	Aged 65 and over
1. Malignant neoplasm	**1.** Diseases of the heart
2. Diseases of the heart	**2.** Malignant neoplasm
3. Certain infectious and parasitic diseases	**3.** Cerebrovascular diseases
4. Chronic liver disease and cirrhosis	**4.** Chronic lower respiratory diseases

Tables:

(3) Alzheimer's Dementia is the most common form of dementia in the US. Given the expanding population, the incidence of Alzheimer's and other dementias are expected to rise dramatically.

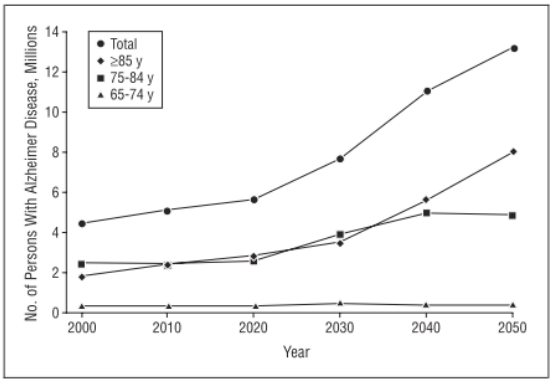


Figure 3. Projected number of persons in US population with Alzheimer disease by age groups, 65 to 74 years old, 75 to 84 years old, and 85 years and older, using the 2000 US Census Bureau middle-series estimate of population growth.

Of the most referenced studies regarding prevalence of dementias in Duthie, AD accounts for 39-70% of cases, vascular cases 13-37%, depression 1-18%, and other 26-48%. Potentially reversible causes include vitamin B_{12} and folate deficiency, hypothyroidism, and depression.

Alzheimer Disease in the US Population. Prevalence Estimates Using the 2000 census. Liesi E. Hebert, ScD; Paul A. Scherr, ScD; Julia L. Bienias, ScD; David A. Bennett, MD; Denis A. Evans, MD. Arch Neurol. 2003;60:1119-1122

(4) Impotence is a common complaint of elderly male patients: 60% of elderly patients report a desire to continue sexual activity, however, by age 70yr, up to approximately 75% of elderly males experience E.D.

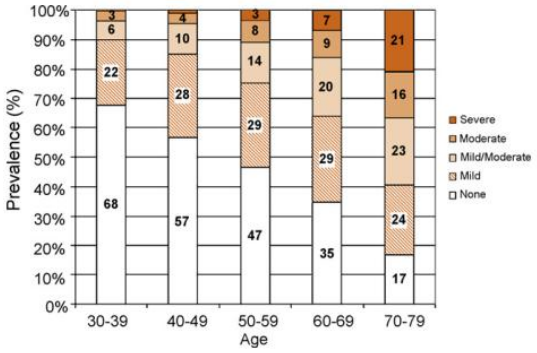


Fig. 1 – Prevalence of erectile dysfunction by age. Weighted percentages.

Image: Association between Smoking, Passive Smoking, and Erectile Dysfunction: Results from the Boston Area Community Health (BACH) Survey. Varant Kupelian, Carol L. Link, John B. McKinlay. European urology 2007/03/16 (volume 52 issue 2 page(s) pages 416 - 422 DOI: 10.1016/j.eururo.2007.03.015)

(5) Osteoporosis by definition is characterized by low bone mass due to deterioration of the bone tissues which is related to an increased fracture risk. Commonly bone mineral density tests are used to evaluate bone quality and risk for future fracture.

"The U.S. Surgeon General estimates that approximately 44 million Americans have low bone mass including 10 million with osteoporosis. As a result, at age 50 years the likelihood of osteoporotic fracture in remaining life is approximately 50% in women and 25% to 30% in men, leading to approximately 1.5 million fractures in the United States annually".

These fractures are estimated to cost *$17.9 billion* annually and costs are expected to triple by 2040. Refer to the falls handout for more info!

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(7) Hypertension in the Elderly –

Approximately 65% of people over age 60 have HTN as compared to ~7% of adults aged 20-39.

Table 32.1 -- Blood pressure classification[*]

Class	Systolic blood pressure		Diastolic blood pressure
Normal	<120 mm Hg	*and*	<80 mm Hg
Prehypertension	120-139 mm Hg	*or*	80-89 mm Hg
Hypertension			
Stage 1	140-159 mm Hg	*or*	90-99 mm Hg
Stage 2	≥160 mm Hg	*or*	≥100 mm Hg

According to the JNC 7 report, target BP of 140/90mmHg is recommended for these patients except if they have high-risk factors (e.g., DM, coronary heart disease, renal damage, or other evidence of target organ damage), for whom 130/80 mmHg is recommended.

Refer to the HTN handout for more information!

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(6 and 11) Medication adherence

Older patients use more medications than younger patients; therefore medication non-adherence generally increases as an individual ages. It is estimated that about 1 in 5 prescriptions are not filled and about 1/3 to 2/3 of patients who fill medications, use them in a manner other than how the physician intended them to be used.

Table 2.4 -- Factors influencing adherence

Factor	Effect on adherence
Age	None
Sex	None
Education level	None
Ethnicity	None
Financial status	None
Actual severity of disease	None
Actual effectiveness or toxicity of drug	None
Belief by the patient that the disease being treated is serious	None
Belief by the patient that the medication will treat or prevent the disease or condition	Increase
Careful explanation by the doctor of the purpose of the medication	Increase
Number of drugs used	Decrease
Long duration of therapy	Decrease
Complex scheduling	Decrease
Safety closure bottles	Decrease

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(8) Urinary incontinence

Incontinence is generally underreported. Women more commonly report urinary incontinence 2:1 as compared to men however, the rate becomes EQUIVALENT at age 80yrs.

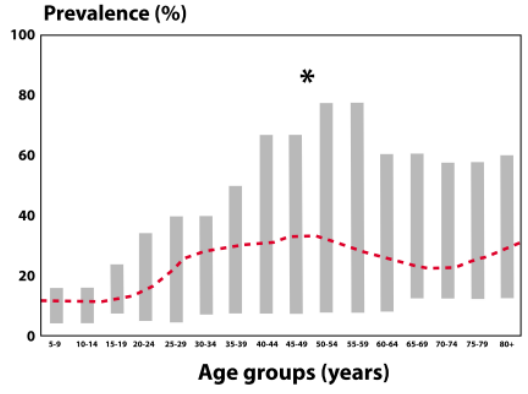


Figure 1. *Prevalence of incontinence in general population of females reported in 13 different studies. Young adult, 20% to 30%; Middle age, 30% to 40%; Elderly, 30% to 50%. Reprinted from Sandvik,' with permission.*

Image: The Prevalence of Urinary Incontinence. Victor W. Nitti, MD. Department of Urology, New York University School of Medicine, New York, NY. Supplement REVIEWS IN UROLOGY *v.3(Suppl 1); 2001.* Duthie: Practice of Geriatrics, 4th ed. Copyright © 2007 Saunders, An Imprint of Elsevier – chapter 16 "Urinary Incontinence."

(9) Hip fractures

Along with the growing population of geriatric patients, the incidence of hip fractures is expected to rise. Mortality associated with hip fractures is estimated to be around 14-36% within the first year of injury. Patients should be treated based on their prognosis for future ability to ambulate. After treatment, at least 50% of patients fail to return to their physical or social baseline and more become unable to return home or function independently after treatement.

For more information, go to the handout on fall risks and fracture prevention!

(12) Refer to the Adult Vaccination Schedule

(13) Suicide and Elderly

12% of the US population is comprised of people >65yrs of age yet they accounted for 16% of suicides in 2004. Geriatric patients have a suicide rate of 14.3/100000 as compared to 11/100000 of the younger population. The most at-risk group is non-Hispanic while men >85yrs of age with a rate of 49.8/100000.

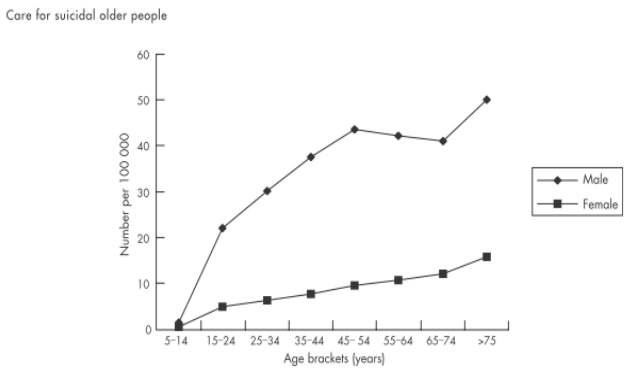


Figure 1 Numbers of suicides (per 100 000 inhabitants) worldwide according to age and sex.

image: Vanlaere, Linus, et al. Care for suicidal older people: current clinical-ethical considerations. 2007 33: 376-381 J Med Ethics

National Institute of Mental Health. Older Adults: Depression and Suicide Facts (Fact Sheet)
http://www.nimh.nih.gov/health/publications/older-adults-depression-and-suicide-facts-fact-

(10) Fall prevention

There are numerous hazards in our physical health as well as in the environment which contribute to fall risk.

Table 17.1 -- Causes of falls derived from epidemiologic studies

Cause	Percent of falls
Accidents/environment	30
Poor gait and balance	17
Dizziness	13
Drop attack	9
Confusion	5
Positional hypotension	3
Visual disorder	2
Loss of consciousness	<1
Other specific causes	15
Unknown	5

For more information, go to the handout on Fall risks and fracture prevention!

(14) Diabetes and the Elderly

- Diagnostic criteria for DM is the same in geriatric patients as in it in younger populations!
- The goals in relation to control of blood glucose do not change with age however, they are LESS stringent. This is because the geriatric metabolism can be more sensitive to change and more difficult to control.

For more information refer to the handout on DM in the elderly!

(15) Depression in the elderly

It is important to remember that depression patients may present with mostly somatic symptoms rather than emotional changes. Some of the more common symptoms to screen for include: HA, fatigue, changes in sleep, CP, body aches/pains, abdominal pain, GI distress, sexual dysfunction

For more information, refer to the handout on depression!

Student Evaluation
UCSD Student-Run Free Clinic Project: Geriatric Home Visit Program
Identifier: _____ Date: _____

A. Do you believe this experience influenced your training/comfort level with the elderly population?

	Yes	No
Skills		
Attitude		

B. How comfortable are you with discussing the following issues with geriatric patients:

	very comfortable	comfortable	neutral	uncomfortable	very uncomfortable
Falls					
Poly-pharmacy					
HTN					
DM					
HLD					
Asthma					
Depression					

C. Please identify what you liked about this experience.
   1.

   2.

D. Please identify ways in which the home visit experience can be improved or changed.
   1.

   2.

HYPERTENSION in the Elderly

Category	systolic	diastolic
normal	<120	<80
pre-HTN	120-139	80-89
Stage I HTN	140-159	90-99
Stage II HTN	>160	>100

epidemiology:

- 65% of patients over age 65yr have HTN as compared to 7% of 20-39yr olds
- BP is more difficult to control as we age – systolics generally rise
- isolated systolic HTN is common after age 65
- lowering *systolic* can help decrease morbidity and mortality until age 80
- of those on medications, only about 50% are "controlled"

etiology:

- primary – "essential"
    - combination of microvascular and renal injury over lifespan
- secondary – renovascular, pheochromocytoma, etc

Table 32.2 -- Factors associated with or age-related changes contributing to hypertension in elderly patients

Type of factor	Examples
Environmental	Dietary sodium chloride; low dietary potassium and calcium; excessive alcohol; sedentary lifestyle; low educational level; smoking; low birth weight; psychosocial factors (such as stress)
Genetic	Monogenic syndromes; gene polymorphisms (e.g., insertion-deletion ACE gene)
Cardiovascular (age-related)	Increased collagen and decreased elastin in smooth and cardiac muscle cells; decreased maximal attainable heart rate, leading to low cardiac output reserve and aerobic capacity; high heart rate, beat-to-beat fluctuation
Renal (age-related)	Reduced renal mass and glomerular filtration rate; increased salt sensitivity
Neurohumoral (age-related)	Decreased baroreflex sensitivity with aging; reduced β-adrenergic modulation and responsiveness with aging; dysregulation of autonomic nervous system (heart beat-to-beat fluctuation); high levels of norepinephrine; endothelial dysfunction; reduction in nitric oxide; increased oxidative stress and inflammatory markers; renin-angiotensin-aldosterone system changes; insulin resistance, obesity

- more labile responses to exogenous factors with age: food, caffeine, exercise, tobacco, meds

complications:

Mechanism	Symptoms
Target organ damage	CNS—stroke symptoms, cognitive impairment
	Cardiovascular—angina, systolic and diastolic heart failure symptoms, pulmonary edema, aortic dissection symptoms, claudication (PVD)
	Renal—uremia symptoms (encephalopathy)
	Ophthalmologic—visual loss, retinal artery occlusion
Blood pressure control	Orthostatic hypotension—orthostatic dizziness, syncope, falls (in institutionalized patients)
	Postprandial weakness or dizziness (postprandial hypotension)

- Hypertensive emergency vs urgency:
  urgency: markedly elevated blood pressure without evidence of acute organ damage
  emergency: BP elevation (usually >180/120 *mmHg*) AND acute target organ damage

HYPERTENSION in the Elderly Continued

workup

- physical exam
  - BP (more than 2x)
  - don't forget to include fundoscopic, JVP, murmurs, bruits, thyroid exam
- risk assessment
  - PMH: assess for CAH, CHF, prior TIA/stroke, PAD, DM, renal insufficiency, sleep apnea
  - Medications
  - Social history: stress, diet, exercise, smoking, alcohol

treatment

- target BP: 140/90
- if DM, CAD, renal disease, evidence of target organ damage: 130/80

stage		Drug therapy	
Blood pressure level	**Lifestyle modification**	**Initial**	**Add on**
Prehypertension	Yes	No antihypertensive indicated[†]	
Stage 1	Yes	Diuretic	Add any class based on comorbidities, indications
Stage 2	Yes	Combination diuretic-based regimen	Add any class based on comorbidities, indications

- lifestyle: decrease wt, salt intake, limit alcohol, improve diet, stress management, smoking cessation
- lowering systolic blood pressure by 10*mmHg* in a patient >65yrs is associated with a reduced risk of
  - total mortality by 13%
  - stroke by 30%
  - coronary events by 23%

Table 32.5 -- Comparison of antihypertensive drugs

Class	Suggested indication	Disadvantages
Diuretic	Recommended first-line therapy	Electrolyte disturbances
β-Blocker	Coronary heart disease; tremors; tachyarrythmias; congestive heart failure	Caution for use with bronchospasm and bradyarrythmia
Angiotensin-converting enzyme inhibitor	Diabetes mellitus; proteinuria; congestive heart failure	Hyperkalemia; renal insufficiency; cough (10%-20%); angioedema (1%)
Angiotensin receptor blocker	Diabetes mellitus; proteinuria; congestive heart failure	Hyperkalemia; renal insufficiency
Calcium channel blocker	Tachyarrythmias (non-dihydropyridine); peripheral vascular disease	Constipation; peripheral edema; short-acting form may be associated with sudden death
α-Blocker	Prostatism; lipid disorders	Avoid use as single agent; orthostatic hypotension
α-, β-Blocker	Pheocromocytoma; hypertension emergencies	Long-term outcome not clear

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#32 "Hypertension".

DIABETES in the Elderly

-fasting glucose >126 mg/dL or random glucose >200 mg/dL x2 (or associated sx)
-oral glucose tolerance test (75g) with 2hr glucose >200mg/dL
-impaired fasting glucose 100-125mg/dL

epidemiology

- incidence is ~25% for 65-74yo patients and increases with age
- However, with age comes increased risk of premature death, HTN, CAD, stroke, and functional impairment as compared to a younger population.
- many elderly will become insulin dependent as the beta cells die out in the pancreas

etiology

- decreased control of glucose metabolism with age → glucose intolerance (even with delayed absorption)
- deficient insulin secretion / impaired insulin action

manifestations/complications

- polyuria, polydipsia, polyphagia with unexplained weight loss
- can be asymptomatic
- increase risk death, disability, HTN, CAD, stroke, PVD
- microvascular disease:
    - retinopathy – retinal hemorrhages, cotton wool exudates, neovascularization, retinal detachment…
    - nephropathy – microalbuminemia → proteinuria → nephrotic syndrome → renal failure
    - neuropathy –
        - symmetric peripheral: stocking glove
        - autonomic: gastroparesis, neurogenic bladder, impotence, orthostatic hypotension
    - accelerated atherosclerosis – coronary, cerebral and peripheral vascular disease
- higher incidence of infection: candidiasis, mucomycosis…

work up

- same diagnostic criteria for the elderly as the younger adult population
- pts should be routinely screen at least every 3yrs
- screen for co-morbidities: hypertension, hyperlipidemia

treatment

- consider the patient's cognitive abilities when designing a treatment regimen
- avoidance of acute complications: hyperglycemia, hypoglycemia
- lifestyle modification: diet, exercise
    - consider that lifestyle may be limited by income, mobility, cognitive abilities
- check HAIC every 3-6m
    - HA1C goal of 7.0%
- yearly microablumin screen to track progression
- yearly ophthalmic exam (dilated retinal)
- yearly podiatry exam
- medications
    - SFU generally the first line agent
    - low threshold for insulin therapy
        - consider ability to self administer

diet	accompany with weight reduction, increase exercise
metformin	↓ hepatic gluconeogenesis, contraindicated in renal or liver failre
sulfonylureas	↑ insulin synthesis, can cause weight gain and hypoglycemia
thiazolidnediones	↑ insulin secretion in adipose and muscle, CI in liver disease, CHF, need to check LFTs
glinides	↑ insulin secretion, less hypoglycemic effect than SFU, weight gain
a-glucosidase inhibitor	↓ intestinal carbohydrate absorption
insulin	associated with hypoglycemia and weight gain

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#45 "Endocrine"

HYPERLIPIDEMIA in the Elderly

epidemiology

- for patients aged 65-74, ~20% men and 40% women have total cholesterol levels of >240
- cholesterol is a contributor to cardiac related morbidity and mortality

complications

- "silent" vascular disease
- major vascular events
  - CV death
  - MI
  - stroke

work up

- fasting cholesterol
- assess risk factors: RFs
  - male >45yr
  - female >55yr
  - smoking
  - HTN
  - family history
  - HDL <40
    - if HDL >60, subtract a risk factor

treatment

- decrease risk 21% for major vascular events for every ↓XOL by 39mg/dL

clinical risk	LDL goals (mg/dL)
High: CHD, CVD, PAD, AAA, DM or 2 RF & 10yr risk >20%	<100 or <75 if very high risk
Mod High: >2RFs & 10yr risk <10%	<130 (<100 optimal)
Mod: >2RFs & 10yr risk <10%	<130
Low: 0-1RF	<160

- statin therapy reduces the risk of non-fatal MIs and overall mortality from CAD

medication	↓LDL	↑HDL	↓TG	Side effects / notes
statins	20-60%	5-10%	10-25%	check LFTs (before, 8-12wks), myalgias, myositis
ezetimibe	15-20%	-	-	well tolerated
fibrates	5-15%	5-15%	35-50%	myopathy risk, dyspnea, gallstones
niacin	10-25%	30%	40%	flushing, pruritis, gout, nausea, hepatitis
resins	20%	3-5%	?	bloating, medication binder

references: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier – ch#29 "Cerebrovascular Disease". ch#31 "Cardiac Disease".
Chart: Sabatine, Mark. Pocket Medicine, 3rd ed. Section 7-16

ASTHMA in the Elderly

epidemiology/symptoms

- a chronic inflammatory disorder – airway hypersensitivity and airflow obstruction
- wheezing, coughing and dyspnea usually associated with a "trigger"
  - irritants, infections, medications
- *the aging lung*: Table 40.1 -- Age-associated alterations in respiratory physiologic parameters

Parameter	Alteration
Total lung capacity	Unchanged
Functional residual capacity	Decreased
Residual volume	Increased
Expiratory flow rate	Decreased
Diffusion capacity—CO_2/alveolar ventilation	Decreased
Alveolar-arterial O_2 gradient	Increased
$Paco_2$	Unchanged
Pao_2	Decreased

  - ↓ expiratory flow rates – less effective cough, premature closure of small airways → hypoxia
  - ↓ ventilator response to hypoxia and hypercarbia
  - elastic recoil of lung decreases with age, chest wall stiffen with age → decrease in compliance
  - FVC decline – male 14-30mL/yr, female 23-32mL/yr

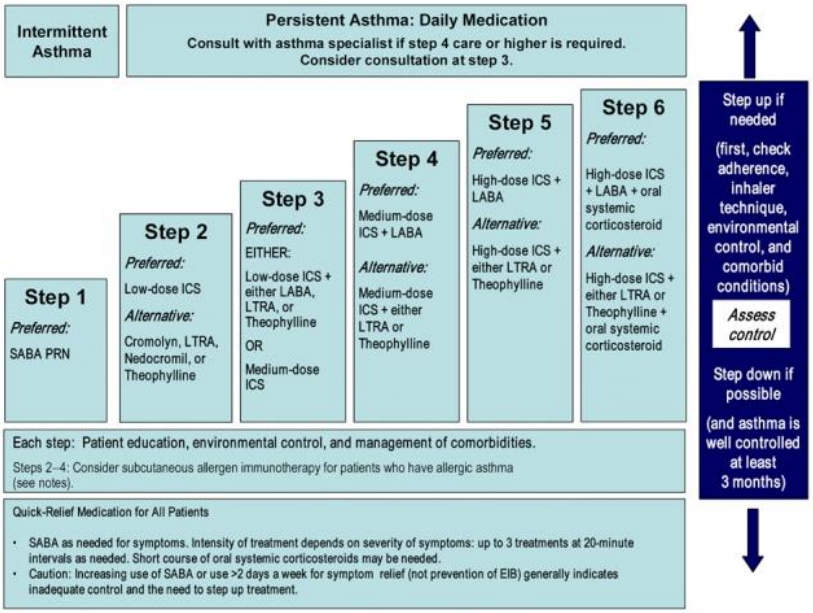
- onset of dyspnea needs to be taken seriously in the elderly
  - may be the first delayed sign of a chronic disease process
- under-diagnosed in elderly population (estimated 7-9% of population >65)
- it can manifest AFTER age 65
- asthma death rates increase with age

work up

- assess for hx of atopy – rhinitis, rash, nasal polyps
  - strongest predictor of asthma
- physical exam: wheezing, prolonged expiratory phase
- pulmonary function testing
- spirometry testing +/- bronchodilators are just as accurate in the elderly as in the younger population
- evaluation for possibility secondary causes of cough/wheezing:
  - GERD, lung cancer, obstructive tumor, COPD, CHF, PE, aspiration, sarcoidosis, pulmonary fibrosis….

treatment

- goal: maximize reversibility of the airway obstruction
- smoking cessation
- need to assess for ability to understand mechanism/administration of medications
  - instruction of proper inhaler use
- review patient's current medication regimens
  - beta blockers for CVD can result in bronchospasm of elderly asthmatics
- refer to the stepwise therapy approach →
  - B agonists remain 1st line in the elderly
    - rapid onset, low incidence of side effects, lack of medication interactions
  - corticosteroids – be cautious about adrenal insufficiency in the elderly



Key: **Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy.** ICS, inhaled corticosteroid; LABA, inhaled long-acting $beta_2$-agonist, LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting $beta_2$-agonist

COPD in the Elderly

	Emphysema	Chronic Bronchitis
definition	dilation of airspaces	productive cough >3m/yr for >2yrs
pathophysiology	matched V/Q defects mild hypoxemia	small airways affected severe hypoxemia V/Q mismatch
manifestations	mild cough constant dyspnea	sputum production intermittent dyspnea
PEX	pink puffer noncyanotic, thin, tachypneic	blue bloater cyanosis, obesity, edema

epidemiology

- COPD = 4th cause of death in US
- cause limitations in usual activities
  - always ask about change in activity level – may be indication of SOB that is not obvious to the pt
  - limited activity, fatigue, physical discomfort
- leads to more acute respiratory infections
- leads to more hospitalizations
- older generation - past history of *smoking* is VERY common
- stage 1 COPD – FEV1/FVC is <70% and FEV1 is >80% predicted
- stage 2 COPD - FEV1/FVC is <70% and FEV1 is <80% predicted – AGE CORRECTED

etiology

- decrease in mucociliary clearance in upper and lower airways with age
- more neutrophils and fewer macrophages in the bronchoalveolar environment with age
  - more interleukin 8 and proteases around to cause damage
- decreased function of immune system – more prone to respiratory pathogens
- chronic cough, sputum production and dyspnea with more frequent exacerbations with progression

work up

- physical exam
- imaging
  - CXR usually shows hyperinflation and flatten diaphragm
- assess lung function: PFTs
  - PFT complicated by cardiovascular, arthritic, cognitive comorbidities during testing

treatment

- C: corticosteroids
  - may slow the FEV1 loss
- O: oxygen
  - if PaO2 <55mmHg for SaO2 <89% during rest
- P: prevention
  - influenza and pneumovax vaccines, smoking cessation
- D: dilators
  - anticholinergic, B agonists, theophylline
    - careful with anticholinergic use in the elderly

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#40 “Pulmonary Disorders”.

DEPRESSION in the Elderly

epidemiology:

- incidence of depression increases with age
- proportionally the geriatric population has the highest rate of suicide as an age group

etiology:

Table 27.1 -- General medical conditions causing or contributing to major depression

Causative factor(s)	Examples
Drugs and poisons	Alcohol, β-blockers, steroids, opiates, barbiturates, withdrawal from cocaine and amphetamines, heavy-metal poisoning, cholinesterase inhibitors, cimetidine, chemotherapy agents
Metabolic and endocrine disorders	Hyper- and hypothyroidism, severe anemia, hyperparathyroidism, hypokalemia, hyponatremia, Cushing's disease, Addison's disease, uremia, hypopituitarism, porphyria, Wilson's disease, Wernicke-Korsakoff syndrome
Infectious diseases	Tuberculosis, Epstein-Barr infection, human immunodeficiency virus (HIV) infection, pneumonia, postinfluenza, tertiary syphilis, encephalitis, postencephalitic states
Neurodegenerative and demyelinating diseases	Alzheimer's disease (50%), multiple sclerosis, Parkinson's disease, Huntington's disease
Other neurologic disorders	Subdural hematoma, normal-pressure hydrocephalus, strokes, other traumatic brain injury, cerebral tumors
Neoplasia	Carcinomatosis, cancers of the pancreas, lung, breast, others
Other disorders	Systemic lupus erythematosus, other collagen vascular disorders, other chronic inflammatory or autoimmune disorders, congestive heart failure

complications:

- worse morbidity – CHF, post MI, nursing homes, cancer, diabetes, AIDS, worsens prognosis
- effect capacity, end of life decisions
    - understand the illness, outcomes, treatment options
    - appreciate significance/implication of the above
    - able to reach rational decision that aligns with personal/culture values
    - expression of decisions – stated clearly and CONSISTENTLY

work up:

- evaluation for dementia
- screen for dementia:
    Sleep—changes may manifest as insomnia or hypersomnia
    Interest—loss of interest or pleasure, or depressed mood
    Guilt—thoughts of guilt or worthlessness
    Energy—loss of energy, fatigue
    Concentration—diminished ability to concentrate or make decisions
    Appetite—changes in appetite and weight
    Psychomotor—psychomotor retardation or agitation
    Suicide—suicidal thoughts, preoccupation with death, hopelessness
- ASSESS FOR SUICIDE RISK!!!!

DEPRESSION in the Elderly continued

treatment:

- exercise - 60-68% in some studies

Table 27.4 -- Characteristics of antidepressants

Class	Name	Comments
Tricyclic	Desipramine (Norpramin)	Most noradrenergic and least anticholinergic of tricyclics; therapeutic levels meaningful
	Nortriptyline (Pamelor, Aventyl)	Almost the least anticholinergic of tricyclics; probably the least likely to induce orthostatic hypotension; therapeutic window is such that serum levels above or below therapeutic are less effective
SNRI	Venlafaxine (Effexor)	Efficacy in severe depression, SSRI failures; few drug-drug interactions, better remission rate over pooled SSRI data; dual reuptake inhibition
	Duloxetine (Cymbalta)	Dual reuptake inhibition, even at lowest doses; alternative in poor responders to SSRIs; useful in MDD with comorbid pain syndrome.
SSRI	Fluoxetine (Prozac)	Longer half-life than other antidepressants; little to no discontinuation syndrome risk; well studied; weekly formulation available
	Sertraline (Zoloft)	Few drug-drug interactions; large medical and geriatric experience; efficacious for severe depression.
	Paroxetine (Paxil)	Efficacy shown for various anxiety disorders
	Citalopram (Celexa)	Few drug-drug interactions; large primary care and geriatric experience in Europe; appears to have early anxiolytic response
	Escitalopram (Lexapro)	*S* stereoisomer of citalopram; possibly fewer side effects and more efficacious than citalopram
	Fluvoxamine (Luvox)	Used as antidepressant in Europe; marketed in United States for obsessive-compulsive disorder
5-HT_2 antagonist	Trazodone (Desyrel)	Mostly off-label use as sedative-hypnotic
	Nefazodone	Used for anxious depression; improves sleep; few sexual side effects; hepatotoxicity risk of concern
DNRI	Bupropion (Wellbutrin, Zyban)	Few sexual or GI side effects; beneficial geriatric profile; may help addictions
MAOI	Tranylcypromine (Parnate)	Avoid foods with tyramine (e.g., cheese), sympathomimetics, which may cause hypertensive reaction; more activing of MAOIs (helpful for patients who are slowed with poor energy, drive, etc.)
	Phenelzine (Nardil)	Avoid foods with tyramine (e.g., cheese), sympathomimetics, which may cause hypertensive reaction; known for anxiolytic benefit among MAOIs
NaSSA	Mirtazapine (Remeron)	Beneficial for agitated refractory patients; few sexual and GI side effects; improves sleep; few drug-drug interactions; SolTab formulation available

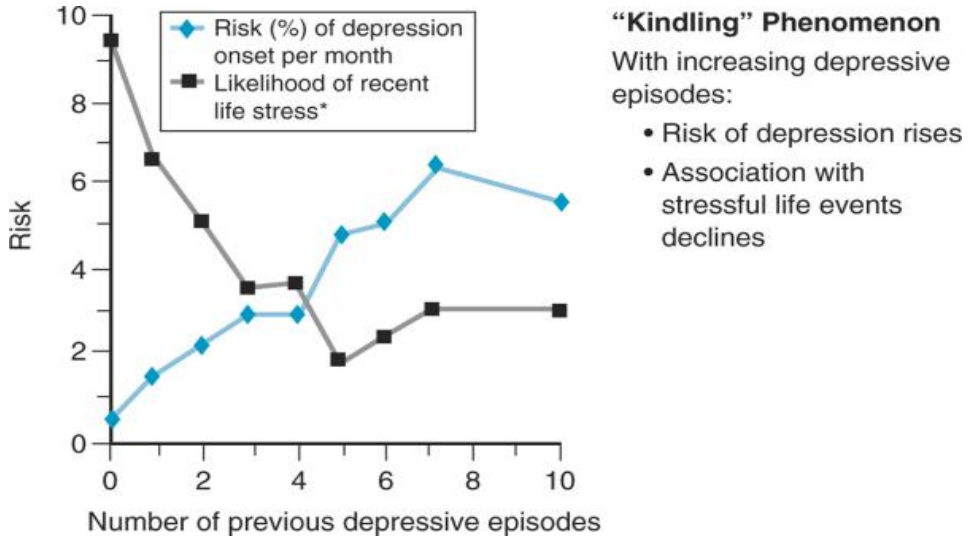


Fig. 27.1 Declining role for stressful life events with recurrent depressive episodes. *Odds ratio for at least one stressful life event during month with a depressive episode.

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#27 "Depression".

DEMENTIA in the Elderly

- usually progressive course
- acquired persistent dysfunction in several domains of intellectual ability:
    - memory, language, visuospatial skills, praxis, executive functioning, calculation
- changes in mood and behavior common with decline
- incidence/prevalence of dementia increases with age
    - 5% over age 65 ----- 20% of 75-85 ----- 5**0% >85yrs**

etiology

Table 25.2 -- Major clinical features of the principal dementia syndromes

Syndrome	Features
Alzheimer's disease	Gradual onset and progression, aphasia, amnesia, apraxia, agnosia, executive dysfunction, visuospatial impairment, concreteness, indifference, preserved motor function
Frontotemporal dementia	Gradual onset and progression, aphasia, apraxia, agnosia, executive dysfunction, relative retention of memory and visuospatial skills until later stages, personality changes such as Kluver-Bucy syndrome, disinhibition, apathy, atypical depression, preserved motor function
Subcortical syndromes	Gradual onset and progression, psychomotor retardation, depression, forgetfulness, executive dysfunction, extrapyramidal signs and symptoms
Lewy bodies Dementia	Gradual onset and progression, aphasia, amnesia, apraxia, agnosia, fluctuating severity, prominent visual or auditory hallucinations, delusions, clouding of consciousness, extrapyramidal signs and symptoms
Vascular diseases	Abrupt onset, stepwise progression, cortical and subcortical features, fluctuating course, preservation of personality, emotional incontinence, depression, focal neurologic signs and symptoms
Psychiatric disorders	Subcortical features, depressed mood, psychomotor retardation, cognitive slowing, poor motivation, executive dysfunction

potentially reversible causes:

- depression – “pseudodementia”
- metabolic – cardiopulmonary failure, hepatic/uremic encephalopathy, anemia, endocrine disturbances (thyroid)
- toxic – medications, alcohol, polysubstance abuse, heavy metals
- other - demyelination, normal pressure hydrocephalus, trauma infection, B12/folate deficiency
- true reversibility is rare

work up

- evaluate for dementia (MSSE)
- evaluate for depression
- establish cause and identify/treat reversible conditions
- identify/treat co-morbidities
- labs – CBC, Chem (Ca, glucose, Creatinine, BYN, biliribin, alkaline phosphatase) Vit B12, thyroid, HIV AB

treatment

- cholinesterase inhibitors are standard treatment for alzheimers – can modestly improve cognition, behavior, function with MILD to moderate dementia
- memantine – moderate to severe cases Alzheimers
- important to screen for medical causes of dementia to treat for cognitive improvement
- symptoms, illnesses, patient and family support

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#25 Dementia.

Osteoporosis / Fall Risk and Fall Prevention / Hip Fractures

What is osteoporosis:
-a multifactorial condition determined by:
- genetics
- dietary – calcium, vitamin D, general nutrition
- use of steroids – corticosteroids/ sex steroids
- use of toxins (tobacco, alcohol) in past
- activity level
- age

-by definition it is imbalanced bone structure due to uneven remodeling: osteoclasts resorb more than osteoblasts form

Common contributors to falls:
I HATE FALLING
"Inflammation of joints or joint deformity
Hypotension (orthostatic, blood pressure change)
Auditory and visual abnormalities
Tremor
Equilibrium problems
Foot problems
Arrhythmias, heart block, valvular disease
Leg-length discrepancy
Lack of conditioning (generalized weakness)
Illness
Nutrition
Gait Disturbances
Mauk, K. (2006). Gerontological Nursing: Competencies for Care. Boston: Jones and Bartlett, p. 367.

HIP FRACTURES

epidemiology
- >50% of patients who suffer hip fractures fail to return to the physical, emotional or social baseline
- many unable to return home or remain independent after a significant fracture

etiology
-many geriatric patients have osteoporosis and they are prone to falls
-fractures are sustained when the patient falls on their side – usually directly on the greater trochanter

Type A: through the neck: "intracapsular fractures"
-potential lose circulation to the proximal femur
-disruption of circulation in proportion to degree of displacement
-risk non-union and avascular necrosis
- on Xray they can appear to be displaced or non-displaced

work up
-hx: generally there has been some injury or fall
-sx: pain on side, groin pain, inability to rise or bear weight after falling
-can see leg shortening and external rotation of the affected leg
-pain with lateral leg rise, pain with bearing weight
-when found: immobilize and transport to ED
-AP and lateral of pelvis and upper femur

Type B: through the intertrochanteric area: "extracapsular fractures"
- more extensive blood supply → bleed more
-better potential for healing
-need to achieve stable reduction and internal fixation which is difficult with osteoporotic bone

treatment
-surgery within 48hrs of injury
-emphasis on regaining mobility
-treatment of underlying comorbidities
- -nutritional status (protein malnutrition)
- -untreated osteoporosis
- -physical abilities
- -cognitive function

-physical therapy – build back muscle, improve gait and balance
-assess need for rehab facility after hospitalization

HOME ENVIRONMENT SAFETY ASSESSMENT

Focus	**Safety concerns**	**Interventions**
Lighting	Outdoor walking areas, entranceways, hallways, stairwells, bathrooms should be well lit.	Install nightlights in the bedroom, bathroom, and hallways leading to the bathroom.
		Keep a flashlight next to the bed in case of power outage or malfunction of nightlight.
		Timer or motion-activated systems for outside areas and entranceways.
		Locate all light switches near doors, at both entrances to a hallway, and both ends of stairways.
Emergency devices and communication systems	Fire alarms should be located on each floor, especially in hallways and near sleeping areas, and in working condition.	Test device regularly.
		Replace battery at least every year.
	Communication must be available and accessible in case of emergency.	Cellular telephone with a belt attachment A telephone in every room used by the older adult, placed to allow access from the floor Personal monitoring systems worn on the body
Flooring	Vinyl and tile floorings in bathroom, kitchen, and laundry areas are often slippery and can cause glare that obstructs vision.	Install nonglare, nonskid flooring.
	Loose, wrinkled carpets and throw rugs pose a hazard for tripping and interfere with safe use of ambulatory assistive devices.	Stretch wrinkled carpets or rearrange furniture so that wrinkles do not run across high traffic areas.
		Remove throw rugs or use rugs with nonskid backing or tape around the edges. Install nonskid strips on steps.
	Uneven transitions such as raised thresholds between rooms are trip/fall hazards.	Bevel/ramp uneven transitions between rooms.
		Enhance depth perception at transition areas with fluorescent tape or contrasting colors of flooring on each side of the transition.
Stairwells	Loose or no handrails	Install sturdy handrails that can easily be gripped by the older adult.
		If handrails are not architecturally possible, options include installation of an electric chair lift (stairglide) or reorganization of the environment to allow single-floor living (may require a portable commode). If only a few steps are present, ramping may be the preferred option, provided a safe grade could be achieved.
Bathroom	Toilet is too low for the older adult to safely stand after use, so towel racks and toilet paper dispensers are used as grab bars.	Install elevated toilet seat with or without armrests.
		Install grab bars in place of towel racks.
	Bathtub/shower stalls are one of the primary locations of falls in the home.	Install nonskid strips or mat on floor of shower or bathtub.
		Install grab bars.
		Encourage use of shower chairs and hand-held diverters to eliminate the need to stand in the shower or struggle in/out of a low bathtub.
Kitchen	Location of frequently used items in high or low shelves increases risk for falls.	Position frequently used items in cupboards that range between shoulder and hip height, reserve high and low shelves for items that are rarely used.
		Clear counter space to allow storage of the client's most frequently used items.
	Excessive need to lift and carry items due to inadequate working space	Clear countertop clutter to maximize working space.
		Install additional countertop space, islands, or tables.
	Inadequate space for use of assistive devices in the kitchen	Rearrange appliances, use smaller tables, or remove tables if seldom used.
		Clear space for use of a walker with a tray or basket for individuals who cannot carry items while walking.
Walkways	Cluttered walkways interfere with safe use of assistive devices.	Make walkways as clear and straight as possible.
		Plan for a few extra inches on each side of the individual and his or her assistive device.
		Avoid placement of furniture and home decorations with sharp edges near walkways.
	Cords from phones and electrical appliances and other trailing materials such as oxygen tubing are tripping hazards.	Use retractable oxygen tubing or portable tanks instead of a main tank with a single long cord for use throughout the entire home.
		Reposition corded electrical devices so that cords run along walls and counters rather than across walkways or under rugs.
		Use cordless, battery powered phones and other devices.

Table 17.5 -- Assessment and management of the home environment

reference: Duthie: Practice of Geriatrics, 4th ed.Copyright © 2007 Saunders, An Imprint of Elsevier –ch#17 “Instability and Falls”

Functional Assessment Staging of Alzheimer's Disease. (FAST)©

STAGE	SKILL LEVEL
1.	No difficulties, either subjectively or objectively.
2.	Complains of forgetting location of objects. Subjective word finding difficulties.
3.	Decreased job function evident to co-workers; difficulty in traveling to new locations. Decreased organizational capacity.*
4.	Decreased ability to perform complex tasks (e.g., planning dinner for guests), handling personal finances (forgetting to pay bills), difficulty marketing, etc.
5.	Requires assistance in choosing proper clothing to wear for day, season, occasion.
6a.	Difficulty putting clothing on properly without assistance.
b.	Unable to bathe properly; e.g., difficulty adjusting bath water temperature) occasionally or more frequently over the past weeks.*
c.	Inability to handle mechanics of toileting (e.g., forgets to flush the toilet, does not wipe properly or properly dispose of toilet tissue) occasionally or more frequently over the past weeks.*
d.	Urinary incontinence, occasional or more frequent.
e.	Fecal Incontinence, (occasional or more frequently over the past week).
7a.	Ability to speak limited to approximately a half dozen different words or fewer, in the course of an average day or in the course of an intensive interview.
b.	Speech ability limited to the use of a single intelligible word in an average day or in the course of an interview (the person may repeat the word over and over.
c.	Ambulatory ability lost (cannot walk without personal assistance).
d.	Ability to sit up without assistance lost (e.g., the individual will fall over if there are no lateral rests [arms] on the chair).
e.	Loss of the ability to smile.

STAGE••_____

*Scored primarily on the basis of information obtained from a knowledgeable informant and/or caregiver.

Table 2. 2002 Criteria for Potentially Inappropriate Medication Use in Older Adults: Considering Diagnoses or Conditions

Disease or Condition	Drug	Concern	Severity Rating (High or Low)
Heart failure	Disopyramide (Norpace), and high sodium content drugs (sodium and sodium salts [alginate bicarbonate, biphosphate, citrate, phosphate, salicylate, and sulfate])	Negative inotropic effect. Potential to promote fluid retention and exacerbation of heart failure.	High
Hypertension	Phenylpropanolamine hydrochloride (removed from the market in 2001), pseudoephedrine; diet pills, and amphetamines	May produce elevation of blood pressure secondary to sympathomimetic activity.	High
Gastric or duodenal ulcers	NSAIDs and aspirin (>325 mg) (coxibs excluded)	May exacerbate existing ulcers or produce new/additional ulcers.	High
Seizures or epilepsy	Clozapine (Clozaril), chlorpromazine (Thorazine), thioridazine (Mellaril), and thiothixene (Navane)	May lower seizure thresholds.	High
Blood clotting disorders or receiving anticoagulant therapy	Aspirin, NSAIDs, dipyridamole (Persantin), ticlopidine (Ticlid), and clopidogrel (Plavix)	May prolong clotting time and elevate INR values or inhibit platelet aggregation, resulting in an increased potential for bleeding.	High
Bladder outflow obstruction	Anticholinergics and antihistamines, gastrointestinal antispasmodics, muscle relaxants, oxybutynin (Ditropan), flavoxate (Urispas), anticholinergics, antidepressants, decongestants, and tolterodine (Detrol)	May decrease urinary flow, leading to urinary retention.	High
Stress incontinence	α-Blockers (Doxazosin, Prazosin, and Terazosin), anticholinergics, tricyclic antidepressants (imipramine hydrochloride, doxepin hydrochloride, and amitriptyline hydrochloride), and long-acting benzodiazepines	May produce polyuria and worsening of incontinence.	High
Arrhythmias	Tricyclic antidepressants (imipramine hydrochloride, doxepin hydrochloride, and amitriptyline hydrochloride)	Concern due to proarrhythmic effects and ability to produce QT interval changes.	High
Insomnia	Decongestants, theophylline (Theodur), methylphenidate (Ritalin), MAOIs, and amphetamines	Concern due to CNS stimulant effects.	High
Parkinson disease	Metoclopramide (Reglan), conventional antipsychotics, and tacrine (Cognex)	Concern due to their antidopaminergic/ cholinergic effects.	High
Cognitive impairment	Barbiturates, anticholinergics, antispasmodics, and muscle relaxants. CNS stimulants: dextroAmphetamine (Adderall), methylphenidate (Ritalin), methamphetamine (Desoxyn), and pemolin	Concern due to CNS-altering effects.	High
Depression	Long-term benzodiazepine use. Sympatholytic agents: methyldopa (Aldomet), reserpine, and guanethidine (Ismelin)	May produce or exacerbate depression.	High
Anorexia and malnutrition	CNS stimulants: DextroAmphetamine (Adderall), methylphenidate (Ritalin), methamphetamine (Desoxyn), pemolin, and fluoxetine (Prozac)	Concern due to appetite-suppressing effects.	High
Syncope or falls	Short- to intermediate-acting benzodiazepine and tricyclic antidepressants (imipramine hydrochloride, doxepin hydrochloride, and amitriptyline hydrochloride)	May produce ataxia, impaired psychomotor function, syncope, and additional falls.	High
SIADH/hyponatremia	SSRIs: fluoxetine (Prozac), citalopram (Celexa), fluvoxamine (Luvox), paroxetine (Paxil), and sertraline (Zoloft)	May exacerbate or cause SIADH.	Low
Seizure disorder	Bupropion (Wellbutrin)	May lower seizure threshold.	High
Obesity	Olanzapine (Zyprexa)	May stimulate appetite and increase weight gain.	Low
COPD	Long-acting benzodiazepines: chlordiazepoxide (Librium), chlordiazepoxide-amitriptyline (Limbitrol), clidinium-chlordiazepoxide (Librax), diazepam (Valium), quazepam (Doral), halazepam (Paxipam), and chlorazepate (Tranxene). β-blockers: propranolol	CNS adverse effects. May induce respiratory depression. May exacerbate or cause respiratory depression.	High
Chronic constipation	Calcium channel blockers, anticholinergics, and tricyclic antidepressant (imipramine hydrochloride, doxepin hydrochloride, and amitriptyline hydrochloride)	May exacerbate constipation.	Low

Abbreviations: CNS, central nervous systems; COPD, chronic obstructive pulmonary disease; INR, international normalized ratio; MAOIs, monoamine oxidase inhibitors; NSAIDs, nonsteroidal anti-inflammatory drugs; SIADH, syndrome of inappropriate antidiuretic hormone secretion; SSRIs, selective serotonin reuptake inhibitors.

Activities of Daily Living

-Basic ADLs are tasks that involve self-care - **Katz**
-Instrumental ADLs (IADLs) refer to those activities that are not necessary for daily functioning but help someone remain independent: **Lawton-Brody**

KATZ BASIC ACTIVITIES OF DAILY LIVING (ADL) SCALE		
	Independent	
	YES	NO
1. Bathing (sponge bath, tub bath, or shower) Receives either no assistance or assistance in bathing only one part of body		
2. Dressing - Gets clothes and dresses without any assistance except for tying shoes.		
3. Toileting - Goes to toilet room, uses toilet, arranges clothes, and returns without any assistance (may use cane or walker for support and may use bedpan/urinal at night.		
4. Transferring - Moves in and out of bed and chair without assistance (may use can or walker).		
5. Continence - Controls bowel and bladder completely by self (without occasional "accidents").		
6. Feeding - Feeds self without assistance (except for help with cutting meat or buttering bread).		

LAWTON - BRODY INSTRUMENTAL ACTIVITIES OF DAILY LIVING SCALE (I.A.D.L.)			
A. Ability to Use Telephone		**E. Laundry**	
1. Operates telephone on own initiative-looks up and dials numbers, etc.	1	1. Does personal laundry completely	1
2. Dials a few well-known numbers	1	2. Launders small items-rinses stockings, etc.	1
3. Answers telephone but does not dial	1	3. All laundry must be done by others	0
4. Does not use telephone at all	0		
B. Shopping		**F. Mode of Transportation**	
1. Takes care of all shopping needs independently	1	1. Travels independently on public transportation or drives own car	1
2. Shops independently for small purchases	0	2. Arranges own travel via taxi, but does not otherwise use public transportation	1
3. Needs to be accompanied on any shopping trip	0	3. Travels on public transportation when accompanied by another	1
4. Completely unable to shop	0	4. Travel limited to taxi or automobile with assistance of another	0
		5. Does not travel at all	0
C. Food Preparation		**G. Responsibility for Own Medications**	
1. Plans, prepares and serves adequate meals independently	1	1. Is responsible for taking medication in correct dosages at correct time	1
2. Prepares adequate meals if supplied with ingredients	0	2. Takes responsibility if medication is prepared in advance in separate dosage	0
3. Heats, serves and prepares meals, or prepares meals, or prepares meals but does not maintain adequate diet	0	3. Is not capable of dispensing own medication	0
4. Needs to have meals prepared and served	0		
D. Housekeeping		**H. Ability to Handle Finances**	
1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help")	1	1. Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income	1
2. Performs light daily tasks such as dish washing, bed making	1	2. Manages day-to-day purchases, but needs help with banking, major purchases, etc.	1
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness	1	3. Incapable of handling money	0
4. Needs help with all home maintenance tasks	1		
5. Does not participate in any housekeeping tasks	0		

Pharmacodynamics in the Elderly – Change with age

Table 2.1 -- Age-related changes relevant to drug pharmacology

Pharmacologic process	Physiologic change	Clinical significance
Absorption	Decreased absorptive surface	Little change in absorption with age
	Decreased splanchnic blood flow	
	Increased gastric pH	
	Altered gastrointestinal motility	
Distribution	Decreased total body water	Higher concentration of drugs that distribute in body fluids; increased distribution and often prolonged elimination half-lives of fat-soluble drugs
	Decreased lean body mass	
	Increased body fat	
	Decreased serum albumin	
	Altered protein binding	Increased free fraction in plasma of some highly protein-bound acidic drugs
Metabolism	Reduced hepatic mass	Often decreased first-pass metabolism and decreased rate of biotransformation of some drugs
	Reduced hepatic blood flow	
	Decreased phase I metabolism	
Elimination	Reduced renal plasma flow	Decreased renal elimination of drugs and metabolites; marked interindividual variation
	Reduced glomerular filtration rate	
	Decreased tubular secretion function	
Tissue sensitivity	Alterations in receptor number	Patients are “more sensitive” or “less sensitive” to an agent
	Alterations in receptor affinity	
	Alterations in second-messenger function	
	Alterations in cellular and nuclear responses	

reference: Duthie: Practice of Geriatrics, 4th ed. –ch#2 “Medication Use”.

Recommended Adult Immunization Schedule

UNITED STATES - 2011

Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Recommended adult immunization schedule, by vaccine and age group

VACCINE ▼ / AGE GROUP ▶	19–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Influenza[1,*]	1 dose annually				
Tetanus, diphtheria, pertussis (Td/Tdap)[2,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs				Td booster every 10 yrs
Varicella[3,*]	2 doses				
Human papillomavirus (HPV)[4,*]	3 doses (females)				
Zoster[5]				1 dose	
Measles, mumps, rubella (MMR)[6,*]	1 or 2 doses		1 dose		
Pneumococcal (polysaccharide)[7,8]	1 or 2 doses				1 dose
Meningococcal[9,*]	1 or more doses				
Hepatitis A[10,*]	2 doses				
Hepatitis B[11,*]	3 doses				

*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of previous infection)

Recommended if some other risk factor is present (e.g., based on medical, occupational, lifestyle, or other indications)

No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at http://www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at http://www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. Information about filing a claim for vaccine injury is available through the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination also is available at http://www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

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